International Scientific Conference of Primary Care

November 23-24, 2023
Cankarjev dom,
Ljubljana, Slovenia

CONFERENCE PROCEEDINGS

ORGANISED BY:

Zdravstveni dom Ljubljana
Community Health Centre Ljubljana

Univerza v Ljubljani
Medicinska fakulteta

Colophon
Title: Proceedings of the 2nd International Scientific Conference of Primary Care - ISCPC

Organised by: Community Health Centre Ljubljana
Medical Faculty, Faculty of Medicine of the University of Ljubljana

Editorial office: Community Health Centre Ljubljana, Metelkova ulica 9, 1000 Ljubljana, Slovenia.

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Design and graphic design: Gregor Rogač, Nastja Slak
Documentation processing: Cankarjev dom, Prešernova cesta 10, 1000 Ljubljana
Web address: https://www.iscpc.si/
File: PDF
Publication: November 22, 2023
Publication price: not for sale
Published: Ljubljana, November 2023

Kataložni zapis o publikaciji (CIP) pripravili v Narodni in univerzitetni knjižnici v Ljubljani
COBISS.SI-ID 172544771
ISBN 978-961-6613-14-9 (PDF)

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WELCOME ADDRESS

WELCOME MESSAGE FROM ORGANISATIONAL COMMITTEE
Tea Stegne Ignjatovič

On behalf of the Organising Committee, I am honoured to welcome you to the 2nd International Scientific Conference of Primary Care, entitled “Interprofessional Teamwork and Quality in Healthcare”. After our first conference, which took place virtually in 2021, we are excited to experience a live conference this year, where we will actually meet and shake hands, learn from each other and exchange good practices for the future through a rich conference programme.

Our conference is unique in that it brings together all the professionals involved in primary health care, from doctors, nurses, social workers, physiotherapists, public health professionals to teaching staff, students and key opinion leaders. Our primary goal is to improve primary health care through the use of science, and we strongly believe in teamwork as a way to address the health problems and growing needs of our aging population.

To provide quality, safe and patient-oriented care, we need a strong primary health care level and a team of different professionals who together care for the individual with various health problems that arise with age and the pandemic of chronic diseases. The conference will discuss new approaches that are needed to prepare for a future that also faces a global shortage of health workers. Your cooperation is very valuable and we hope you will take advantage of this experience and make your stay in the beautiful Slovenian capital pleasant and leave with a lot of new knowledge.

Tea Stegne Ignjatovič

WELCOME MESSAGE FROM THE SCIENTIFIC COMMITTEE
Prof. Zalika Klemenc Ketiš

On behalf of the Scientific Committee, I am delighted to welcome you to the International Scientific Conference of Primary Care (ISCPC) in Ljubljana, Slovenia. This year's conference focused on the theme of "Interprofessional Teamwork and Quality in Health Care." Primary care is essential to delivering high-quality, accessible, and affordable health care to all. It is also the foundation for effective population health management.

The ISCPC conference provides a unique opportunity for primary care clinicians, researchers, policy makers, and other stakeholders to come together to share knowledge, best practices, and innovative approaches to improving primary care.

The conference features a variety of plenary sessions, workshops, and poster presentations on a wide range of topics, including:

- Interprofessional teamwork: How can we best work together to provide high-quality, patient-centred care?
- Quality improvement in primary care: How can we measure and improve the quality of care we provide?
- Chronic disease management: How can we best support patients with chronic diseases in managing their health?
- Population health management: How can we use data and analytics to improve the health of our communities?
- Primary care education and training: How can we ensure that future generations of primary care providers are well-equipped to meet the needs of their patients?

The ISCPC conference is an important event for the primary care community. It provides a forum for us to learn from each other, share our successes, and identify opportunities for improvement. I encourage you to participate fully in the conference and to make the most of this opportunity to network with colleagues and learn from experts from around the world.

Together, we can make a difference in the lives of our patients and communities!

Prof. Zalika Klemenc Ketiš

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ACKNOWLEDGEMENTS

The Organising Committee is deeply appreciative of the sponsorship generously provided by the following companies:

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PROGRAMME
DAY 1 - November 23, 2023

CONFERENCE PROCEEDINGS:

8.00–8.45 REGISTRATION & MEET UP

8.45–9.30 Opening — *Kosovel Hall*

9.30–10.00 **Mieke Rijken, PhD:** **Person-centred integrated care for people with multimorbidity: needs, care models and outcomes** — KEYNOTE
Moderator: Nena Kopčavar Guček

10.00–10.15 Discussion

10.15–10.45 BREAK & MEET UP

10.45–11.55 Oral session: Integrated Care
Moderator: Staša Vodička — *Kosovel Hall*

10.45–10.55 **Facilitators and Barriers to Scale-up Integrated Care for Hypertension and Type-2-Diabetes in Slovenia: A Qualitative Study among Stakeholders at Different Levels**
Črt Zavrnik (Slovenia), Nataša Stojnić, Majda Mori Lukančič, Matic Mihevc, Tina Virtič, Zalika Klemenc-Ketiš, Antonija Poplas-Susič

10.55–11.05 **Enhancing Patient-Tailored Home Care through Collaboration between Primary and Secondary Care**
Natalija Shaurek Aleksandrovska (North Macedonia), Branko Aleksov

11.05–11.15 **The use of complementary and alternative medicine among patients in general practitioner's office**
Mirjana Krepek, Vojislav Ivetić (Slovenia)

11.15–11.25 **Content Validity and Cognitive Testing in the Development of Motivational Interviewing Self-Assessment Questionnaire**
Tadeja Hočevar (Slovenia), Tim Anstiss, Danica Rotar Pavlič

11.25–11.35 **Knowledge, attitudes, and practices regarding infection control: A survey of nurses in primary care settings - Kosovo**
Behrije Halilaj-vishi (Kosovo)

11.35–11.45 **Prevalence and correlates of anxiety and depression among Slovenian breast cancer survivors in the first 5 years post-treatment during COVID-19: A cross-sectional study**
Spela Mirosevic (Slovenia), Judith Prins, Nikola Bešić, Simona Borštnar, Marko Popović, Zalika Klemenc-Ketiš

11.45–11.55 **Decision-oriented aspects of a university primary care centre: A multidimensional analysis in the context of the Johannes Kepler University Linz**
Philipp Aigner (Austria)

10.45–12.15 Workshops — *E2 Hall*

WORKSHOP 1:
How to research about integrated care?

The workshop will focus on research methodologies that can be used to study integrated primary health care. Participants will be invited to present their research ideas. They will be asked to develop a methodological plan for the research, receiving feedback from the workshop facilitators.

Workshop leader:
Zalika Klemenc Ketiš

11.55–13.15 BREAK & MEET UP

13.15–14.15 **Prof. Robin Miller:** **Social Care: the missing piece of the primary care jigsaw?** — KEYNOTE — *Kosovel Hall*
Moderator: Tina Virtič Potočnik

14.15–14.30 Discussion

14.30–15.40 Oral session: Interprofessional Education
Moderator: Špela Mirošević — *Kosovel Hall*

14.30–14.40 **Knowledge transfer in multidisciplinary teams in long-term care**
Anamarija Kejžar, Patricija Frece, Maša Bizjan (Slovenia)

14.40–14.50 **Validation of the Slovene version of the STOP-BANG questionnaire in a primary practice setting**
Andrej Pangerc (Slovenia), Leja Dolenc Grošelj, Marija Petek Šter

14.50–15.00 **Possibilities for further developing of »Careful Assessment« tool in the treatment of patients with medically unexplained conditions**
Eva Svatina Šošić (Slovenia), Vojislav Ivetić

15.00–15.10 **Specialized registered nurses' contribution to the reduction of diabetic complications: a retrospective study**
Metka Žitnik (Slovenia), Patricija Lunežnik

15.10–15.20 **Experiences with Telemedicine and Digital Tools among Primary Health Care Level Physicians in Pomurje, Slovenia**
Staša Vodička (Slovenia), Silvija Prainer

15.20–15.30 **Organizational barriers for knowledge management in interprofessional practice of healthcare team**
Anže Jurček (Slovenia)

15.30–15.40 **Patient reported indicator surveys (PaRIS): methodological considerations of a field trial in Slovenia**
Matija Ambrož (Slovenia), Candan Kendir, Zalika Klemenc Ketiš

14.30–16.00 Workshops — *E2 Hall*

WORKSHOP 2:
Research proposals in primary care

The workshop is aimed at PhD students in primary healthcare. They will be asked to present their research ideas for their doctoral dissertation, present their dissertation methodology or present pilot results. They will get feedback from senior researchers in primary healthcare.

Workshop leader:
Davorina Petek

15.40–16.40	POSTER SESSION	
1.	General Medicine Research Network - Creation of a Framework for the Setup of a General Medicine Research Network in Upper Austria	Fabian Bekelaer (Austria)
2.	A multidisciplinary approach to the early detection and treatment of multiple myeloma	Dragan Gjorgjievski (North Macedonia)
3.	Online and Face-to-Face Learning model – our experience from TRANSSIMED Project	Elizabeta Kostovska Prilepchanska (North Macedonia)
4.	The role and good practices of patronage nursing in primary health care in Slovenia - A case study	Tina Krajnc (Slovenia)
5.	Burnout in Family Medicine Trainees During Pandemic	Jerca Kranjc (Slovenia)
6.	A bottom-up cost analysis of telemonitoring in primary care for patients with arterial hypertension and type 2 diabetes: a case of the SCUBY study	Mihevc Matic (Slovenia)
7.	Portal for patients – new way of electronic communication	Gea Novak (Slovenia)
8.	The impact of the Covid-19 epidemic on the newly diagnosed patients with arterial hypertension and type 2 diabetes and their management in family medicine clinics of the Maribor region	Barbara Pernek (Slovenia)
9.	Science day with health education - experiences of health professionals, teachers and students	Tanja Podlipnik (Slovenia)
10.	Interprofessional collaboration between Community nurses and General practitioners in palliative care: a literature review	Jožica Ramšak Pajk (Slovenia)
11.	Red Code Protocol and experiential learning with simulations - impact on the survival of patients after sudden cardiac arrest in the Community Health Centre Ljubljana	Mateja Škufca Serle (Slovenia)

17.15–18.00 FIELD VISITS (OPTIONAL)

Meeting point: *next to registration desk in Cankarjev dom at* ***16.45****.*

Practical visit to Simulation Centre of Ljubljana Community Health Centre with demonstration of education with simulation

A tour of a simulation centre operating at primary level. Participants will be able to see high fidelity simulations of emergency conditions at primary level (1. Advance life support, 2. Palliative patient at primary level, 3. Paediatric life support).

Practical visit to Ljubljana Community Health Centre' primary care practices

A tour of the family medicine practices and visit to the diagnostic laboratory, which has the most modern technology at the primary level.

DAY 2 - November 24, 2023

8.00–9.00 REGISTRATION & MEET UP

9.00–9.30 **Dr. Andree Rochfort:** **Patients, Professionals, Primary Care and Planetary Health**
Moderator: Zalika Klemenc Ketiš
KEYNOTE — Kosovel Hall

9.30–9.45 Discussion

09.50–11.10 Oral session: Quality & Safety
Moderator: Črt Zavrnik — Kosovel Hall

9.50–10.00 **Patient Portal and Central Registry of Patient Data: leading accelerators of healthcare digitalisation in Slovenia**
Živa Rant (Slovenia), Jure Janet, Dalibor Stanimirović

10.00–10.10 **How cultural and ethnical characteristics influence the use of primary care services in North Macedonia?**
Sashka Janevska (North Macedonia), Katerina Kovachevikj, Elizabeta Kostovska Prilepchanska, Katarina Stavrikj

10.10–10.20 **Patient safety culture in the Community Health Centre Ljubljana**
Tina Virtič Potočnik (Slovenia), Zalika Klemenc-Ketiš

10.20–10.30 **A Qualitative Study Exploring Facilitators of and Barriers to Interprofessional Collaboration among Healthcare Providers in Primary Healthcare Centers in Qatar**
Alla El-awaisi (Qatar)

10.30–10.40 **Quality Assessment of Interprofessional Approach to Elderly Care in Family Medicine in Slovenia**
Maja Cvetko Gomezelj (Slovenia), Zalika Klemenc-Ketiš

10.40–10.50 **How to confront violence in healthcare environment**
Nena Kopčavar Guček (Slovenia)

10.50–11.00 **Examination of employee satisfaction at the health center Zagreb-West**
Juraj Jug (Croatia), Franka Luetić, Jelena Rakić Matić

11.00–11.10 **Preliminary analysis of open data pertaining to the services available through the Health Insurance Institute of Slovenia and provided by family medicine**
Luka Petravić (Slovenia), Vojislav Ivetić

09.50–11.30 Workshops — E2 Hall

WORKSHOP 3:
Use of simulation in integrated care

The workshop will present the use of simulations in primary healthcare education. We will focus on gamification and the use of the simulated patient. Participants will have the opportunity to participate in simulations and give feedback.

Workshop leaders:
David Halliwell
Uroš Zafošnik
Nino Fijačko

11.10–12.00 BREAK & MEET UP

12.00–12.30 **Assist. Prof. Marit Vassboten Olsen:** **Simulation-based learning in education**
Moderator: Uroš Zafošnik
KEYNOTE — Kosovel Hall

12.30–12.45 Discussion

12.45–13.30 Closing Ceremony

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ORAL SESSION: INTERPROFESSIONAL EDUCATION

ORAL SESSION: QUALITY & SAFETY

POSTER SESSION

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Oral presentations

Enhancing Patient-Tailored Home Care through Collaboration between Primary and Secondary Care

Natalija Shaurek Aleksandrovska MD, MSc[1,2]; Branko Aleksov MD, Internal Medicine Specialist[3]
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Abstract— **Introduction – Primary care doctors are the first instance where patients turn when they have a worsening health condition. But family doctors are not always able to help their patients when their health condition worsens. Sometimes, referral to a specialist is not possible due to a lack of an appointment through the "My appointment" application. Therefore, interdisciplinary cooperation is of particular importance in the treatment of our patients.**

Case description – I present a case of 63-year-old female with severe fatigue and fever. Before her doctor's visit she performed a PCR test for COVID. It was negative. Past medical history: Diabetes mellitus, HTA.

The patient got a referral for lab work and chest X-ray. From the examination, blood tests and chest X-ray, a diagnosis of Bronchopneumonia was made. She was prescribed an antibiotic and other supportive therapy. On my part, a consultation by phone was made with an infectious disease specialist who insisted that the patient be hospitalized due to the above-mentioned results. After the conversation with the patient and the advice for hospitalization, she refused to be hospitalized. She is a single mother of a child with special needs who cannot take care of herself. Therefore, a specialist in internal medicine from the Diabetes Department in the Health Center was consulted. After taking the anamnesis, I came to the conclusion that the patient did not take her diabetes therapy regularly. She was told to receive the therapy and to come for a check-up in two days. In the next ten days, the patient was called every second day for an examination with the family doctor and at the same time a consultation with the specialist in internal medicine from the Diabetes Department was made until her medical condition got better.

Conclusion – Interdisciplinary cooperation is of particular importance in the treatment of our patients. In this way, they receive the necessary health care, thereby reducing the need to visit emergency departments.

Index Terms—**integrated care, primary care, secondary care**

I. INTRODUCTION

Primary care doctors, including family physicians, are typically the first healthcare professionals' patients consult when they experience health concerns. They are responsible for initial assessments, diagnoses, and treatment plans. (1) However, there are situations where family doctors may face limitations in addressing these issues, such as the unavailability of specialist appointments. In such cases, interdisciplinary cooperation and collaboration become essential for providing comprehensive and timely care.

Primary care doctors are well-positioned to provide preventive care and manage chronic conditions. Collaborating with specialists allows for early detection and management of conditions, which can prevent the need for emergency care or hospitalization. (2) This collaborative approach, often referred to as care coordination or integrated care, has been shown to improve patient outcomes, enhance the efficiency of healthcare delivery, and lower healthcare costs. Collaboration can lead to more informed decision-making about tests and procedures, reducing unnecessary healthcare utilization, which can contribute to hospitalizations. (3)

II. MATERIAL AND METHODS

Case Presentation

History on the present illness: A 51-year-old female patient comes for a medical examination early Monday morning. She complains of increased temperature, occasional shortness of breath and malaise. The symptoms started four days ago. Before coming for the examination, the patient took two Covid tests (rapid and PCR). Both tests were negative. For the past few days, she had been taking Ibuprofen to reduce fever and fluids. But her health condition was getting worse.

Social History: She denies tobacco, alcohol and illicit drug use. She is a widower, mother of two adult children. Her son is 30 years old (currently serving a prison sentence), and a daughter who is 23 years old with combined developmental disabilities with elements of autism. She works in court as a clerk.

Allergies: No known medicine, food, or environmental allergies.

Past medical history: Diabetes, hypertension. No prior surgery.
Medications: Atorvastatin 40 mg (1x1), Perindopril/indapamide 4/1,25 (1x1), Amlodipine 10 (1x1), Carvedilol 3,125 (2x1), Gliklazid 60 mg (2x1).

III.RESULTS

Physical exam:
Vitals: Temperature 38°C, heart rate 100/min, respiratory rate 22/min, saturation O2 92, blood pressure 140/90, BMI 30.
General: The patient is slowed down, lethargic, tachypneic and frightened. She is conversing freely.
Respiratory: Tachypneic. On auscultation, there was bilaterally weakened breathing.
Cardiovascular: She has regular rate and rhythm with no murmurs, rubs or gallops.
Initial evaluation
Laboratory Studies: SR 64; CRP 272.2; WBC 23.8; Glycemia 24.3; Creatinine 133.18.
Chest X-ray: Reactive left hilar array, diffuse nodular conglomerates in the mid-basal parts of both lungs (dense in the left lung) with a reduction in airiness. All this stated goes in favor of Bronchopneumonia in both lungs.
Diagnosis
Based on the clinical symptoms, laboratory results and X-ray diagnosis of Bronchopneumonia was made.
Management
Since the patient was in poor health, with comorbidities, and the results obtained were poor, a fellow infectious disease specialist from a nearby city hospital was immediately contacted by phone. She immediately suggested hospitalization. The patient was called by phone and told that she would need to be hospitalized. Despite her poor health, she refused admission to the hospital because there was no one to take care of her daughter, who has special needs.
Due to the complexity of the situation and the poor state of health of the patient, it was decided to treat the patient on an outpatient basis in cooperation with my colleague doctor from secondary health. In the Health Center where I work, there is a Diabetes Department where patients go for diabetes treatment. The colleague from the center was immediately contacted. He suggested that the patient be placed on insulin therapy. At the same time, the inflammatory process of the lungs had to be treated.
The patient immediately started receiving the antibiotic Moxifloxacin a 400 mg (1x1), electrolytes with a higher fluid intake and vitamin C 1000 1x1. After the conversation with the patient regarding diabetes therapy (Tabl Glika (gliklazid) 60 mg 2x1, Tabl Agnis (vildagliptin) 50 mg 2x1) she declared that she did not take the one drug (Tabl Agnis 50 mg) at all because it was expensive to buy. Since she was afraid to start insulin therapy immediately because of her poor health, she said she would also buy the second diabetes medicine. A control examination was scheduled for two days.
At the follow-up examination, the patient is slightly better. On auscultation, weak breathing persists. A biochemical blood analysis was done again and the following results were obtained: CRP 220.7; Glycemia 21.2; HbA1c 10.6; WBC 19.0. Follow-up is scheduled again in four days.
At the second follow-up the patient is visibly better, the weakness has decreased, she is more communicative and more open to talking about insulin therapy. I did blood biochemical analyzes again and got the following results: SR 32, CRP 5.3; WBC 20.4; Glycemia 15 mmol/l; Creatinine 113. The next day I arranged an appointment with the specialist at the Diabetes Department. After completed consultation and education, the patient was placed on Tresiba insulin therapy once a day. In the following weeks, the patient had regular glycemic controls and titration of insulin units at the Diabetes Department. Despite insulin therapy, she had variations in glycemic values (between 9 and 12mmol/l). White blood cell counts returned to normal within the next two weeks.

IV.DISCUSSION

Primary care providers are often the first point of contact for patients when their health condition worsens. The study produced by Battersby et al shows that they can educate patients about managing their health and help them navigate the healthcare system, reducing the likelihood of emergency situations. (4) When primary care physicians and specialists work closely together, there is a better flow of patient information and medical history. This helps ensure that patients receive more comprehensive and seamless care, reducing the risk of complications that might lead to hospitalization. (5)
In the Republic of North Macedonia, there is no appointment system in primary healthcare. Therefore, the patient can visit the practice of his family doctor at any time when he/she or his/her substitute is on shift. The lack of sufficient health culture and education contributes to the fact that patients come for an examination for a common cold, headache, or even just to measure blood pressure. During the Covid pandemic, due to the lack of Covid centers and the mixing of patients, some clinics started to schedule appointments individually. But not all patients respect it. In particular, in my office there is an appointment system and 60-70% of patients respect it.
On the other hand, appointments with specialists in secondary and tertiary healthcare are systemically regulated through the My Appointment system. But here we face problems too. Most of the time there are no appointments when we need them. This mostly applies to urgent, non-life-threatening health conditions. Because of this, patients are forced to go to emergency centers. Crowds, worries and long waiting times are created there.
In the My Term appointment system, there are three types of referrals that are issued to patients. They are a regular referral with an appointment, a priority referral for patients who need to perform an examination or diagnostic procedure within seven days, and an urgent referral that is valid for 24 hours. According to the patient's condition, the family physician decides what type of referral will be issued.
Secondary healthcare has it shear of problems too. Specialists are overbooked with filled prescription appointments for chronic therapy medications and diagnostic procedures that are not available to primary care physicians. They do not have

specific appointments for emergency patients. In the last month, some procedures for prescribing chronic therapy have changed, but not everything has been put into practice yet.

In the presented case, at the time the patient came for an examination, there were no free appointments for x-rays and at the diabetes center. In such situations, some of us primary care physicians use personal contacts with specialists to refer the patient to the necessary tests and examinations. But should it be so? Since my practice is located in the Health Center, it was not a problem to contact the colleagues from the secondary healthcare at the x-ray and laboratory departments, and then at the Diabetes Center. Personal acquaintance and telephone contact with the infectious disease specialist was also of great help. Since the patient was in a very bad condition, she was taken to the laboratory and to the x-ray diagnostic department with a priority referral. The results were done promptly in less than two hours and the treatment was started immediately.

But not every family doctor works in a health center or close to it. Our colleagues in rural and suburban areas are facing a shortage of secondary care doctors. They are forced to either deal with seriously ill patients themselves or send them to emergency centers. In our healthcare system, the number of doctors who have direct contact with colleagues from secondary healthcare is very small.

Collaboration between family doctors and colleagues from secondary health care should be at a higher level. Collaborative care promotes evidence-based medicine and shared decision-making, leading to more appropriate and targeted diagnostic tests and treatments. Saini and colleagues in their study indicate that this approach can reduce healthcare costs while maintaining or improving patient outcomes and reduce sending patients to emergency centers. (6)

The psychological state of the patient was another problem I faced. Despite her poor health, she did not want to be hospitalized because there was no one to take care of her daughter, who is with special needs. There is no center in Macedonia that could take care of such patients 24 hours a day. There are only day care centers for people with special needs. The concern for the child and the fear that something would happen to her was constantly present during the treatment. The stress she had had a large part in the variations in glycemic values despite the use of insulin therapy.

V. Conclusion

Primary care doctors are often the first line of defense for patients, but they may encounter limitations in managing worsening health conditions. The importance of interdisciplinary cooperation in healthcare cannot be overstated, as it ensures that patients receive the most appropriate care, even when referrals to specialists may be challenging. Collaboration between primary care and secondary care doctors is a critical component of a patient-centered healthcare system. It can lead to better health outcomes for patients, reduce the burden on hospitals and emergency departments, and ultimately result in cost savings for the healthcare system as a whole.

For this case report to be publicly presented, the patient gave a signed informed consent.

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The use of complementary and alternative medicine among patients in family medicine office

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Abstract— **BACKGROUND: The use of complementary and alternative medicine has grown significantly in recent years. The purpose of the study was to examine the reasons for using complementary and alternative medicine and the related factors. METHODS: The research was based on a questionnaire which was presented to 690 randomly selected patients between March 1 and July 31, 2017, in two general practitioner's offices at the Community Health Centre dr. Adolf Drolc Maribor. The questionnaire covered the fields of official medicine, visiting the healer and self-healing with complementary and alternative methods. RESULTS: The questionnaire was completed by 425 respondents. It was found that (162) 37.8% of the respondents had already visited the healer. Most often, complementary and alternative methods were chosen as supplement treatment to official medicine. The most common health problem that caused the participants to visit a healer was back pain, and the most common reason for self-healing with complementary and alternative methods was cough. Most often, respondents visited bioenergetic therapist, and most often treated themselves with herbs. Patients who visited general practitioner more frequently during the year, decided in higher percentages to visit the healer than those who visited general practitioner less frequently. More than half of the respondents did not or would not tell their doctor about the use of complementary and alternative medicine unless they would be asked. CONCLUSION: We found out that the respondents use complementary and alternative medicine, most often as supplement treatment to official medicine. Therefore, it is very important for general practitioner doctors that we are aware of the use of complementary and alternative medicine and that we discuss about it with our patients during consultations in an open and clear manner.**

Index Terms—**complementary medicine, alternative medicine, general practice, family medicine**

I. Introduction

Complementary and alternative medicine includes measures and activities based on complementary and alternative medicine systems and methods which are performed in a way that does not harm human health (1). The commonly used abbreviation is CAM. Complementary treatment methods are used as an addition or supplement to conventional medicine or together with it. They complement conventional treatment but do not replace it. Alternative therapeutic procedures are used instead of conventional medicine. The combination of both treatment approaches, complementary and alternative, constitute a combination of medical and healthcare systems, methods and products which are not part of conventional medicine (2, 3).

According to a study from 2007, CAM is used in the US by 38.3% of adults and 11.8% of children (aged 17 or less) (3). Women, people with higher education, and people with higher income are more common users. The most commonly used method was shown to be natural products (17.7%), followed by deep breathing techniques (12.7%), meditation (9.4%), chiropractic (8.8%), massages (8.3%), yoga (6.1%), diets (3.6%), relaxation (2.9%), guided visualization (2.2%), and homoeopathy (1.8%) (3, 4). Adult Americans most commonly use CAM for musculoskeletal problems such as lower back pain, neck and joint pain (3, 4).

In Slovenia, Cvetko T. conducted a survey in 2002 among 716 individuals who had their primary care physician in the Municipality of Koper (5). She found that within a year, 31% of them used complementary forms of treatment (she avoided the term complementary and alternative medicine due to a negative connotation) (5). The following was most commonly reported: massages (30.0%), herbs (23.0%), multivitamins (18.0%), energy (14.0%), thermal baths (14.0%), Kozmodisk spine massager (12.0%), chiropractic (11.0%), relaxation techniques (8.7%), weight loss programs and diets (7.7%), acupuncture (3.8%), homoeopathy (2.0%), and self-help groups (2.9%) (5).

The role of complementary and alternative medicine in national healthcare programs depends on the policy of each country, and the statutory regulation of CAM activities significantly varies among countries (6). Acupuncture is the only among CAM in Slovenia officially placed on the list of permitted medical services, thus becoming a part of standard treatment (7). This means it is reimbursed from mandatory health insurance, provided that it is performed by a healthcare professional within public healthcare service (7).

The purpose of our study was to examine the reasons as to why patients who come to their general practitioner's office seek treatment at a healer and related factors.

II. Material and Methods

Subjects

The sample included random patients who attended two selected offices at the Community Health Centre dr. Adolf Drolc Maribor between 1 March and 31 March 2017 and were willing to participate in the study. Exclusion criteria in sampling participants were younger than 18 year and older than 80 year of age

Data collection

The data were collected by means of a questionnaire we developed based on literature review. A minor part of the subjects completed the questionnaire in the waiting room, while the others received it to their email address. The questionnaire consisted of 16 questions, and the time needed to complete it was 5 to 10 minutes. Data on the gender, age, monthly income, employment status and marital status were collected.

Questions 1 and 2 related to the use of official medicine, i.e., the frequency of visits to the personal doctor for Question 1 and the frequency of visits to a clinical specialist for Question 2. Questions 3, 4, 5 and 6 related to the treatment at a healer, namely whether they had ever visited one (if the answer was NO, they continued completing the survey questionnaire with Question 7), which healer they had visited, the reason for visit, and health issue that had made them seek help from a healer. Questions 7 and 8 related to self-treatment with CAM, namely whether they had ever self-treated themselves using any CAM, which method it was, and which health issue made them use a specific CAM. Question 9 asked about whether they had notified their primary care physician about using CAM and whether it was linked to a specific question asked by the physician about using CAM. Question 10 listed statements regarding the effectiveness of CAM treatment, price ranges and using CAM in the future. The statements were rated on a scale from 1 to 5 where 1 means "I do not agree at all" and 5 "I completely agree".

Statistical processing

The characteristics of the sample were specified using descriptive statistics. For categorical variables (gender, education level achieved, employment status, marital status), frequencies and percentages were calculated, and for continuous variables (age, monthly income), mean values and standard deviations were calculated. For all variables measured on the Likert scale, it was assumed that they are interval variables, and the parametric tests were used accordingly. Bivariate statistical tests were used. The SPSS statistical software (IBM Corp., Armonk, NY), version 23, was used to analyze the data. For interference analyses, the level of confidence used was $\alpha=0.05$.

Opinion provided by the Ethics Committee

The study was approved on 19 September 2015 by the Republic of Slovenia National Medical Ethics Committee (application No. 0120-356/2015/2).

III. RESULTS

The survey was presented to 690 patients, and 425 (61.6%) of surveys were completed. There were 288 (67.8%) women and 116 (27.3%) men, and 21 (4.9%) of the respondents did not answer the question about the gender. The mean age was 44.4 (SD=13.4) years, with male mean age being 45.8 (SD=13.8) year, and female 43.7 (SD=13.3) years. The youngest respondent was 20 years old and the oldest 83. 24 (5.6%) did not provide their age. 132 (32.9%) of the respondents had university level education, 122 (28.7%) secondary level education, 59 (13.9%) had master's degree, specialization, or doctorate, 4 (0.9%) had finished primary school or less, and 24 (5.6%) did not provide their level of education. 290 (68.2%) of the respondents were employed, 61 (14.4%) retired, 37 (8.7%) unemployed, 12 (2.8%) students, and 25 (5.9%) did not provide their employment status. 298 (70.1%) of the respondents were married or cohabiting, 87 (20.5%) were single, 12 (2.8%) widowed, and 28 (6.6%) did not provide their marital status.

It was found that 162 out of 425 (37.8%) respondents had visited an alternative healer compared to 263 out of 425 (62.2%) who had not. Statistical analysis showed a statistically significant difference in the covered sample – the number of those who had not visited an alternative haler is statistically higher, $\chi 2(1)=24.00$, $p<0.001$.

On the average, the respondents mostly agreed (M=4.0 SD=1.3) that they had visited a healer to complement their doctor's treatment. The most important reasons with which the respondents agreed to the greatest extent (among the reasons listed) were that the healer sees their disease in a more holistic way (M=3.4 SD=1.4), due to adverse effects of pharmaceutical products (M=3,1 SD=1,6), and because the healer wants the patient to be actively involved in the treatment process (M=3.1 SD=1,5). The reason with which the respondents on the average disagreed to a greatest extent was that the decision for being treated by the healer was not wanting to burden their physician with their problems (M=1.9 SD=1.3).

The most respondents used natural herbs (19.9%), followed by dietary supplements (15.5%), treatment with bee products (11.6%), and alternative exercise (10.8%).

The highest number of the respondents went to see a bioenergetic therapist (31.5%), followed by massage therapist (15.9%), acupuncture therapist (13,5%) and a homoeopath (13.2%).

The most respondents went to see a healer due to lower back pain, followed by fatigue and join pain. The following was reported by the respondents under 'other': preparation for childbirth, anaemia, sudden change in body weight, carpal tunnel syndrome, painful breasts, burning tongue, insufferable pain after shingles, hair loss, smoking, stomach problems, periodontitis, bladder problems, infertility, diabetes, chronic sinusitis, impaired immune system, gynaecological problems, prevention (energy balancing), migraine, allergies, neuropathic pain, rheumatism, parkinsonism, lymphoma, hormonal problems, kidney sand, menstrual cramps, epilepsy, psoriasis, carcinoma, kidney failure, fungal diseases, stress management, lung cancer, CIBD, AH, atopic dermatitis, abdominal pain.

The most respondents were being self-treated with alternative methods due to cough, followed by virosis, fatigue, headache, nervousness or irritability. The following problems were reported by the respondents under 'other': burning tongue, lung cancer, bladder problems, skin problems, neck pain, varicose veins, stomach problems, infertility, diabetes, urinary

problems, weight loss, stress management, menopause, allergies, bloating, frostbite, autoimmune disease, ear infection, frequent sore throat, for better well-being, finger infection, psoriasis, hair loss, anemia, Candida, low pressure, acne, indigestion, hormonal problems, leg cramps, prevention, abdominal pain, frequent streptococcal angina, resolving problems following chemotherapy, obesity, voice loss, eye inflammation, herpes

The results showed a statistically significant association between the frequency of visiting the primary care physician and visiting an alternative medicine healer, $\chi 2(3)=8.31$, $p=0.043$. Those who visit their primary care physician more frequently during the year decide in higher percentages to visit an alternative medicine healer than those who visit their physician less frequently (Table 1).

Table 1: Frequency and percentage display of the association between the frequency of visiting primary care physician and visiting an alternative healer

			Visit to an alternative healer		
			Yes	No	Total
Frequency of visiting primary care physician	Less than once per year	f	34	79	113
		f %	30.1	69.9	100.0
	1 to 3 times per year	f	95	148	243
		f %	39.1	60.9	100.0
	4 to 8 times per year	f	25	32	57
		f %	43.9	56.1	100.0
	More than 8 times per year	f	8	4	12
		f %	66.7	33.3	100.0
Total		f	162	263	425
		f %	38.1	61.9	100.0

A half of the respondents would not tell their physician about using alternative methods because the physician does not ask about it. 42.6% reported they told them by themselves, and 1.8% would not tell their physician in any case (Table 2).

Table 2: Frequency and percentage display of reporting to the primary care physician about using alternative methods

	f	**f %**	**Valid f %**	**Cumulative f %**
Yes, I told him/her by myself.	121	28.5	42.6	42.6
Yes, because the physician asked me about the use of any alternative methods.	13	3.1	4.6	47.2
No, because the physician did not ask me about the use of any alternative methods.	145	34.1	51.1	98.2
I would not tell her/him even if they asked.	5	1.2	1.8	100.0
Total	284	66.8	100.0	
Missing	141	33.2		
Total	425	100.0		

IV. Discussion

Our sample was limited to the patients from two practices at the Community Health Centre dr. Adolf Drolc Maribor. The questionnaire was not standardized but an original prepared based on the literature. According to the Statistical Office of the Republic of Slovenia, the population of Slovenia at the time of the survey was 2,064,836; 1,025,125 men and 1,040,770 women (8). The ratio between men and women in our sample was different, with women being represented in a higher number. The mean age of the respondents was 44.4 years, which only slightly deviates from the mean age of the Slovenian population at the time of the survey, which was 43.0 years (8).

In terms of education level, the respondents had higher level of education compared to the Slovenian sample. In the general Slovenian population, among those above the age of 15, most people have secondary level of education (52.7%), followed by primary school level or less in 25.2%, and 22.0% with higher or university level education (9). Among the respondents, the majority had higher or university education level, 46.8%. The difference in the education level could be due to the fact that the practices are located in the center of Maribor City, which has more educated people compared to the rural areas and towns in Slovenia.

The sample also included a statistically significantly higher number of those who had not visited an alternative healer, so caution is advised when generalizing the results to the general Slovenian population.

The survey found that 162 (37.8%) respondents had visited an alternative healer. These figures are slightly higher than those found by Cvetko in 2002 (10), which showed that 30.8% of the respondents had visited a healer, and closer to the US survey (38.3%) (4). In England and Australia, the percentage of CAM users is even higher, amounting to 44.0% and 44.1%, respectively (10, 11). The differences in the percentages can be likely attributed to the inclusion of different forms of CAM into this group when designing the study.

It was demonstrated that more frequently individuals visit their primary care physician, in higher percentages they decide to be treated by an alternative medicine healer. Therefore, these

are patients who are more active in seeking solutions for their problems, which was also demonstrated by Kersnik J. (12).

The most commonly visited healer was a bioenergetic therapist (31.5%), followed by massage therapist (15.9%), homoeopath (13.2%) and acupuncturist (13.5%). These results differ from the results of the study conducted by Cvetko T., which ranked massage (30%) first, followed by energy treatment in 14.0%, while homoeopathy was used just by 2.0% and acupuncture by 3.8% of respondents (5). An increase in the use of acupuncture could be due to the fact that it had been placed on the list of permitted healthcare services and is reimbursed from mandatory health insurance (provided it is performed by a healthcare professional within a public healthcare service). Homoeopathy is also more accessible, since homoeopathic preparations are available in some pharmacies, together with appropriate counselling about their use.

On the average, the respondents visited a healer for 2.6 (SD=1.3) medical problems. The most common reason was lower back pain, followed by fatigue and join pain. J. Kersnik (12) also reports lower back pain as one of the main reasons for using CAM. The data are similar to those reported from a study in the US (4), with the most common reason for using CAM being problems with musculoskeletal system such as lower back pain, and neck and joint pain.

The most common reasons for self-treatment with CAM were cough and virosis, namely in the form of natural herbs, which is consistent with the data from other studies (4-6,10,11,13).

We also checked whether the respondents would tell their physician about the past or future use of alternative methods. More than a half said they would not tell unless asked by the physician. J. Kersnik also showed that only 28.9% of patients talk to their doctor before using CAM and that only 38.2% of patients tell their doctor about their past use of CAM (12). It is therefore important to be aware of CAM use and that patients are asked about its use.

V. CONCLUSION

It was found that respondents use complementary and alternative treatment methods. They are eager to help themselves with herbs, and most commonly visit a bioenergetic therapist. Most forms of CAM are used as a complementary and not replacement method of treatment.

The most common reason for visiting a healer is lower back pain, followed by fatigue and join pain. Self-treatment with CAM is most commonly used for cough and virosis.

The information that more than a half of the respondents did not or would not tell their physician about using CAM unless specifically asked seems meaningful. It is therefore important for a general practitioner to establish a permanent personal relationship with all of their patients based on mutual trust. During consultations, the use of CAM must be discussed openly and transparently.

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KNOWLEDGE, ATTITUDES, AND PRACTICES REGARDING INFECTION CONTROL: A SURVEY OF NURSES IN PRIMARY CARE SETTINGS- KOSOVO

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***Abstract*—**: Nurses in primary care are in the frontline and are more susceptible to infections while interacting with patients through exposure to bodily fluids, infected body parts, blood, and medical materials..**Aim of the Study:** This study seeks to evaluate the knowledge, attitude, and practices related to standard infection control precautions among healthcare professionals in primary healthcare (PHC) centers in Kosovo.**Subjects and Methods:** In this cross-sectional study, 124 healthcare professionals from Kosovo PHC centers were included, utilizing an electronic questionnaire for data acquisition..**Results:** A majority of participants were nurses, possessing high school and Bachelor's degrees (46.3% and 36.1%, respectively), primarily aged over 40 years (59.3%) and boasting more than 10 years of work experience (69.4%). Approximately half reported having dedicated rooms for medical waste (50% and 46.3%). Participation in infection control training was reported by 74.8%, with around 90% showing a positive attitude towards infection control policies and 80% reporting high practice levels. There was a negligible variance in the statements, knowledge, and attitudes about infection control related to socio-demographic data; most participants had work experience, infection control training, and were older, consistent across all PHC centers.**Conclusions:**Healthcare workers in PHC centers demonstrate substantial knowledge and optimal practices regarding standard precautions for infection control, with a predominantly positive attitude. Recommendations include expanding sterilization and waste management spaces in PHC, enhancing training programs, and intensifying supervision regarding infection control policies and procedures in PHC settings.**Keywords:** Infection Control,, Knowledge, Attitude and Practices, Primary Health Care, Health care workers

I. INTRODUCTION

Healthcare professionals (HCPs) are particularly vulnerable to infections during their interactions with patients, due to exposures to body fluids, blood, and infected regions, as well as the materials utilized in patient care (Al-Ahmari et.al.,2021). Healthcare-associated infections (HAIs) are typically acquired during medical procedures or diagnostic examinations within healthcare settings (NSW Health, 2017). Preventing hospital-acquired infections is crucial in delivering safe, high-quality services in healthcare facilities by introducing barriers between susceptible hosts and infectious microorganisms. The strategies like forming dedicated infection control committees, implementing proper waste handling and sanitation protocols, and ensuring adherence to occupational protection standards can mitigate the avoidable morbidity and mortality associated with HAIs (Bayleyegn B et.al.,2021).

According to the World Health Organization (WHO), infection control is a disciplined approach to preventing infections, aiming to protect those susceptible to infections, both in the community and healthcare settings, particularly those with pre-existing health conditions. The fundamental principle of infection prevention and control is maintaining proper hygiene [WHO, 2011].

A majority of healthcare infections are transmitted by healthcare personnel who neglect proper hand hygiene and fail to change gloves between patient interactions. Nursing staff, who have more extensive contact with patients and their families, face a heightened risk of acquiring and transmitting pathogens (Asodike Maria et.al.2021).

HAIs represent a significant public health issue worldwide, causing substantial morbidity, mortality, and economic burden due to the extended duration of care and additional costs, particularly in low- and middle-income countries. These infections are prevalent in intensive care units and among neonates [WHO, 2017].

Infection Prevention and Control (IPC) is a practical, evidence-based clinical and public health specialty focused on safeguarding patients, healthcare workers, and visitors from avoidable infections, including those induced by antimicrobial-resistant pathogens, during healthcare interactions (NSW Health, 2017) . IPC is paramount in maintaining the safety and quality of care for every healthcare interaction [WHO, 2022].

Data from various sources, including the European Centre for Disease Prevention and Control (ECDC) and the United States Centers for Disease Control and Prevention (USCDC), elucidate the prevalent issues of HAIs in different healthcare settings [3,4]. The ongoing COVID-19 pandemic has underscored the importance of IPC due to the high transmission rates of SARS-CoV-2 in healthcare settings [11,12] (WHO, 2022).

Even with the extensive promotion of standard precautions and the availability of numerous guidelines, the level of knowledge, attitudes, and the practice of these precautions among healthcare professionals is still considerably suboptimal, and the application of these precautions is often underreported (Al-Ahmari et.al.,2021).

The goal of this study is to scrutinize the knowledge, attitudes, and practices of healthcare professionals operating in primary health care (PHC) centers in Kosovo in relation to the standard precautions of infection control.

II. Material and Methods

This study was a cross-sectional examination including 124 healthcare professionals from Primary Health Care (PHC) centers in Kosovo. Data was amassed through an electronic questionnaire structured into six distinct segments:

1.Socio-Demographic Characteristics- This section gathered information on gender, age, profession, highest qualification,education, and experience in PHC practice.
2.Profile of PHC Centers and Healthcare Professionals-This focused on aspects regarding infection control within primary health care centers and amongst healthcare professionals.
3.Knowledge Regarding Infection Control- Five questions pertained to infection control knowledge and standard precautions, concentrating on aspects related to sharps and needles, application of standard precautions, and diseases transmitted by contaminated needles and sharps. Each correct response was assigned one score, with incorrect or incomplete ones receiving zero. Based on total percentage scores, participants were categorized into:
-Those with ≥60% were regarded as having acceptable (Good) knowledge.
-Those with <60% were seen as having unacceptable (Poor) knowledge.
4.Attitude Assessment- Participants' attitudes were measured using seven statements about infection control and standard precautions, responded to on a five-point Likert scale ranging from strongly agree to strongly disagree. After calculating the total attitude score (35 points maximum), participants were categorized as:
-Positive attitude for scores ≥60% (>21 points).
-Negative attitude for scores <60% (less than 21 points).
-Neutral attitude for scores equal to 60% (21 points).
5.Practice Assessment Regarding Infection Control- This section assessed the practices of healthcare providers using six questions on a five-point scale, ranging from always to never. Based on total practice scores (30 points maximum), participants were categorized into:
-Good practice for those who achieved ≥70% (21 points or more).
-Poor practice for those who achieved <70% (20 points or less).
6.Perception of Obstacles- Participants rated perceived obstacles to the proper application of standard precautions and infection control as "not important," "important," or "very important."

Each section was meticulously designed to extract a nuanced understanding of the knowledge, attitudes, practices, and perceived obstacles that healthcare professionals in Kosovo PHC centers have regarding standard precautions of infection control.

III. Result

A comprehensive participation of 124 healthcare providers was achieved in this study. As delineated in Table one, it is evident that a substantial majority of the healthcare professionals (HCP) involved in this study were female, representing 86.3% of the respondents. Furthermore, a significant proportion, 56.5%, were aged over 40 years.

A closer examination of the occupational distribution reveals that the predominant profession among the participants was nursing, constituting 73.4% of the contributors. Regarding educational background, 47.3% of the participants had completed high medical school. Moreover, a considerable 66.9% of the participants had acquired over ten years of experience in Primary Health Care (PHC) settings.

In table two, it is indicated that a modest majority, approximately 54.8%, reported having a designated room for sterilization purposes. Additionally, 51.6% confirmed the availability of a distinct room specifically for managing medical waste. Notably, the majority of the participants, representing 66.7%, have undergone training in infection control.

Fig.1.Generally, a significant majority of participants, around 90%, demonstrated substantial knowledge regarding infection control policies and procedures. The statistical analysis reveals a noteworthy association between good practice and participants' years of experience in PHC, along with their participation in training programs about infection control

Table 4. Illustrates the participants' understanding of infection control. A majority, 61.3%, strongly concur that standard precautions are instrumental in preventing infection in primary health care settings. A significant proportion, 35.5%, strongly refute the notion, "There is no necessity to wash or decontaminate hands after making contact with the patient's environment," and 24.2% hold a neutral stance on this. A substantial 70.2% ardently agree that utilizing gloves during patient care is a beneficial strategy to curtail the transmission risk of pathogens. Furthermore, a predominant segment of health workers, 62.9%, emphatically agree that in the absence of standard measures, health care facilities can indeed become infection and disease epidemic sources.

Table 5. Presents the practices relating to infection control among participants. The vast majority of the participants (96%) consistently wash their hands before examining their patients, and a substantial majority (87.1%) always secure the needles immediately after use. Similarly, a significant number (70.2%) consistently use gloves during patient examinations, and 82% regularly employ face masks when examining potentially infectious patients. However, only 33.9%

consistently utilize protective goggles during procedures, but a considerable majority, about 83.1%, do adhere to wearing medical gowns during the procedures. Overall, a significant proportion of participants, 75.6%, demonstrate good practice concerning infection control, while 24.4% exhibit poor practice, as depicted in Figure 3.

IV. Discussion

This investigation was designed to scrutinize the levels of understanding, viewpoints, and application of infection control measures among professionals in primary healthcare settings. The results revealed that a substantial majority, more than two-thirds of the participants, demonstrated profound knowledge regarding infection control.

When compared to an earlier study executed in Abha City, Kingdom of Saudi Arabia[1], approximately 31.6% of healthcare providers exhibited deficient knowledge about infection control. Nonetheless, a significant 88.2% manifested positive attitudes towards the protocols and policies of infection control, whereas 49.5% showcased suboptimal levels of practice. Various studies from different regions like Abuja, Nigeria, and Ethiopia, [7,9] have depicted analogous findings, revealing a disparity in knowledge of standard precautions, usage of Personal Protective Equipment (PPE), and adherence to standard precautions owing to misconceptions, resource scarcity, and insufficient training opportunities.

In the present research, a predominant proportion of participants were female (86.3%), with more than half being above the age of 40 years (56.5%). The majority of participants were nurses (73.4%), and 47.3% had attained high medical school education, with 66.9% boasting over ten years of experience in Primary Health Care (PHC). A considerable majority declared having separate rooms for sterilization (54.8%) and for medical waste (51.6%), and most have participated in infection control training (66.7%).

Generally, an overwhelming 90% of participants displayed comprehensive knowledge of infection control policies and procedures. The analytical data unveiled a notable association between the adherence to good infection control practices and the years spent in PHC, coupled with participation in relevant training programs. In terms of the participants' insights and practices in infection control, a consistent majority recognized the imperative nature of standard precautions, consistent hand hygiene, and the employment of PPE to curb infections and hinder the transmission of germs.

Regarding the execution of infection control measures, a majority of participants professed consistently implementing preventive strategies such as handwashing, and utilizing gloves, face masks, and medical gowns during examinations and procedures. This denotes that 75.6% of the participants maintained commendable practices in relation to infection control, whereas 24.4% demonstrated inadequate practices.

Lastly, concerning the impediments to the execution of infection control policies and procedures, a significant 64.5% and about a third (34%) identified the absence of infection control training as a major or extremely significant hindrance. Additionally, inadequate handwashing facilities and scarcity of PPE were also deemed to be considerable obstacles. Approximately 62.1% and 52% of participants marked the lack of established guidelines in primary healthcare centers and a dearth of healthcare workers as substantial or extremely substantial concerns respectively, with overcrowded workplaces being the least concerning obstacles (54.8% and 29%).

The statistical analysis emphasizes that the adherence to apt practices was significantly influenced by the cumulative years of experience in PHC and the attendance of specialized infection control training sessions.In this chapter, we explain the results in the light of other research available. We state what we have discovered and what others have found.

TABLE I.Socio-demographic characteristics of health care professionals, Kosovo 2023

Characteristics	Nr %
Age groups	
<30 years	21 (16.9%)
30-40 years	33 (26.6%)
>40 years	70 (56.5%)
Gender	
Male	17 (13.7%)
Female	107 (86.3 %)
Position	
Physician	0 0%
Dentist	2 (1.6%)
Nurse	91 (73.4%)
Lab technician	18 (14.5%)
Dental assistant	12 (9.7%)
Qualification	
PhD/MD/equivalent	3 (2.4%)
Master	19 (15.3%)
Bachelor	43 (34.7%)
High med school	59 (47.6%)
Experience in PHC	
<5 years	28 (22.6%)
5-10 years	13 (10.5%)
>10 years	83 (66.9%)

TABLE II: Profile of primary health care centers and health care professionals regarding infection control

Characteristics	**Nr (%)**
Availability of a special room for sterilization in PHC center	

Yes	56 (45.2%)
No	68 (54.8)
Availability of a special and separate room for medical waste	
Yes	64 (51.6)
No	60 (48.4)
Having attended a training program on infection control	
Yes	82 (66.7)
No	41 (33.3)

TABLE III.**Knowledge of infection control policies and procedures among primary care health professionals in Kosovo 2023**

Statements	True	false
Dirty needle and sharp materials can transmit disease causing agents (TRUE)	97.6%	2.4 %
Standard precautions should be practiced on all patients and laboratory specimen serology irrespective of diagnosis (TRUE)	91.9%	8.1 %
When you have a patient who vomited in dressing room or clinic, the first step in infection control procedure is to isolate infected area (TRUE)	87.9%	12.1%
Sharp containers are utilized for used injection needles (TRUE)	84.7%	15.3%
Hepatitis B causing agent can be transmitted with dirty needles and sharps (TRUE)	97.6%	2.4%
HIV/AIDS causing agent can be transmitted with dirty needles and sharps (TRUE)	91.9%	8.1%

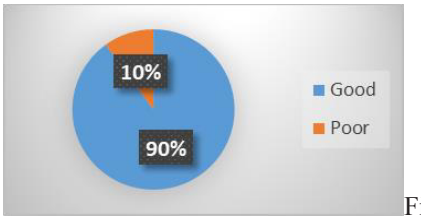

Figure 1.Knowledge grades of participants about infection control

TABLE IV.Attitudes of primary care health professionals towards infection control policies and procedures in the health sector Kosovo 2023

Statement	Strongly agree	Agree	Neutral	Disagree	Strongly disagree
Standard precautions prevent infection at health care facility	61.3 %	37.1%	1.6%		
There is no need to wash or decontaminate hands after touching the patient environment	9.7 %	9.7%	24.2 %	21.0 %	35.5 %
Using gloves while patient care is a useful strategy for reducing risk of transmission of microbes	70.2 %	23.4%	4.8%		0.8%
In absence of standard precautions, health care facilities can be the source of infection and disease epidemics	62.9 %	29.0%	4.0%	3.2%	

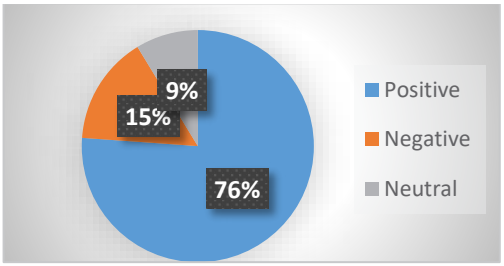

Figure 2: Attitude grades of participants toward infection control policy and procedures

TABLE V.Participants' practices regarding infection control policies and procedures in the health sector Kosovo 2023

Practices	Always	Often	Sometimes	Rarely	Never

Washing hands before examining patients	96%	4 %			
Recapping needles immediately after use	87.1 %	6.5 %	3.2%		3.2%
Using gloves while examining all patients	70.2 %	22. 6%	4.8%		2.4%
Using face mask while examining possibly infective patients	82.3 %	12. 1 %	4.8%	0.8%	
Wearing goggles during procedures	33.9 %	29. 8%	25.8 %	4.8%	5.6%
Wearing medical gown during the procedures	83.1 %	6.5 %	5.6%		4.0%

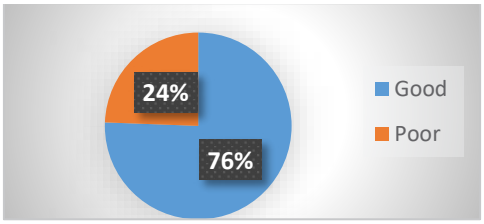

Figure 3: Practice grades of participants about infection control

Table 6.Obstacles against infection control policy and procedures in health sector Kosovo 2023

Statements	Not Important	Important	Very important
Lack of training on infection control guidelines	4.0%	64.5%	31.5%
Lack of personal protection equipment	7.3%	55.6%	37.1%
Inadequate hand washing facility (alcohol solutions)	4.8%	57.3%	37.9%
Lack of guidelines at primary health care centers	4.0%	62.1%	33.9%
Lack of health care workers	11.3%	52.4%	36.3%
Overcrowded work place	16.1%	54.8%	29.0%

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Decision-oriented aspects of a university primary care centre: A multidimensional analysis in the context of the Johannes Kepler University Linz

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***Abstract*—The *Institute of General Practice* of the *Johannes Kepler University Linz* is planning to establish Austria's first *university primary care centre* – a group practice at the primary care level which is organizationally integrated into the university. In addition to the provision of regional primary care, this pilot project is envisioned to facilitate practical training for medicine students and patient access for academic research in the field of general medicine. Therefore, it can be expected to simultaneously address several significant challenges faced by Austria's healthcare and education system. Based on literature research, this paper identifies eight conceptually distinct elements which are decision-relevant for the establishment of the *university primary care centre* and evaluates whether this endeavour appears to be fundamentally feasible from the respective perspectives. Additionally, relevant concepts and success factors are discussed at the level of each of the eight elements. *Patient care*, *practical teaching*, and *academic research* are identified as the three core elements which represent the services directly provided to the *university primary care centre*'s customers – i.e., patients, students, and researchers. Additionally, *legal structure*, *organization and management*, *business administration and finance*, *location and premises* as well as *IT infrastructure* are identified as the five support elements. This concept is illustrated by a figurative house which has a foundation composed of the five support elements and a main floor consisting of the three core elements, all under the roof of a university primary care unit. After the analysis of each dimension separately, it can be concluded and confirmed that the establishment of Austria's first *university primary care centre* in Linz appears to be fundamentally feasible. Due to its innovative approach, this pilot project can serve as a blueprint and case study for similar undertakings, in other parts of Austria but also beyond. Therefore, further accompanying scientific analyses are recommended.**

***Index Terms*—Austria; Education, Medical, Graduate; General Practice; Health Facility Planning; Primary Health Care**

I. Introduction

Austria is facing several challenges in sustainably maintaining the provision of primary health care at the currently high level of quality. Amongst the most crucial challenges is the existing lack of general practitioners which is predicted to further aggravate significantly over the next decade due to the retirement wave of doctors of the baby boomer generation, the increasing demand for medical care due to the aging population, and the shortage of medical graduates pursuing training in the field of general medicine. [1,2]

Beyond direct patient care, the provision of practical teaching to medicine students is considered a challenge as well. Practical lessons form an integral part of the curriculum of the human medicine degree but since, in contrast to other medical specialties, general medicine does not have a corresponding department at the university hospital, the organization of such training is often laborious and complex. [2,4]

Another notable challenge in the field of general medicine is the access to primary patient data for research. Since patients cannot be accessed through a corresponding department at the university hospital, the *Institute of General Practice* of the *Johannes Kepler University Linz* ("*JKU*") has established a research network including several general medicine practices spread over Upper Austria. However, the research collaboration with the network members is relatively complex and laborious due to their geographical dispersion and the need for coordination. [5]

The *JKU* is located in Linz, capital of the federal state of Upper Austria, and currently offers 310 university places per year to medicine students through its medical faculty. The university's *Institute of General Practice* is currently working on the pilot project to establish Austria's first *university primary care centre* which is organizationally integrated into the medical faculty. As such, it is envisioned to unite regional medical care for patients at the primary level with enhanced opportunities for academic research and practical teaching in the discipline of general medicine, thereby tackling the challenges described above. The term *primary care centre* is specified by Austrian federal law and describes a specific form of group practice at the primary care level. Together with *primary care networks*, which describe a specific form of collaboration by close-by practices, the corresponding umbrella term is *primary care unit*. Of the currently 50

primary care units which are operational across Austria, none is organizationally integrated into a university, thus making this a pilot project not only for the region of Upper Austria but also for Austria and beyond. [4,6]

After having developed the vision and having secured the general support of relevant stakeholders, such as the *Austrian Health Insurance Fund* and the *Upper Austrian Medical Chamber*, the *Institute of General Practice* is currently planning and negotiating matters regarding the implementation of Austria's first *university primary care centre*. Aim of this paper is to support this innovative pilot project by providing a scientific basis focusing on decision-oriented aspects from multiple relevant perspectives.

II. Material and Methods

The data used in this research was gathered through analyses of literature. For this purpose, the *Handbook for Founding a Primary Care Unit* [7] was used as one of the main sources of information and forms the conceptual basis of this paper's analyses. This 204-page-long document was published in its latest edition in August 2023 by the Austrian *Federal Ministry of Social Affairs, Health, Care and Consumer Protection* and was created in collaboration with various subject matter experts including the *National Public Health Institute*. Its intended purpose is to provide a structured overview on how to establish a *primary care unit*, therewith making it a fitting document to base this paper on, in terms of content and reliability.

Methodically, in a first step, conceptually distinct and decision-relevant dimensions of the implementation of a *university primary care centre* are identified and defined, based on the insight from literature. Those elements are then conceptionally organized and sub-divided. In order to meet the aspiration for multi-perspectivity, in each case, it is researched whether, the integration of a *primary care centre* into the *JKU* appears to be fundamentally feasible from the respective perspective. Also, decision-relevant factors and concepts are identified and discussed in the light of the pilot project.

III. Results

From the vision and aspired purpose of the *university primary care centre* described in the introduction, it is evident that relevant aspects of this undertaking comprise the provision of primary care for patients, the facilitation of practical training for medicine students as well as patient access for academic research in the field of general medicine. These three aspects fulfil the criteria of being decision-relevant and conceptually distinct from each other. Therefore, they are regarded as separate dimensions to be analysed in the course of this work. The *Handbook for Founding a Primary Care Unit* is structured around five dimensions, each of which is deemed decision-relevant for setting up a *primary care unit* and to each of which a separate chapter is dedicated. Those five dimensions are composed of the *legal structure*, *organization and management*, *business administration and finance*, *location and premises*, and *IT infrastructure*. Since they meet the criterium of decision-relevance and are conceptionally distinct from one another other as well as from the three dimensions identified earlier, they are included as elements to be discussed in this analysis.

So, overall, eight conceptually distinct dimensions can be identified as decision-relevant for setting up a *university primary care centre*. (see *Fig. 1*) According to business management theory, these can be sub-divided into core and support elements, whereby *patient care*, *practical teaching*, and *academic research* are counted towards the core elements since they represent directly value-adding aspects of a *university primary care centre*. The remaining five dimensions are classified as support elements because they merely represent aid functions which are needed to enable the actual services provided to customers. The term *customers* in this context refers to patients, medicine students, and academic researchers, in accordance with the three core elements identified. [8]

Symbolically, a house can be used to portray this concept in a structured, yet illustrative fashion. Therein, the support elements can be depicted as the indispensable foundation on which the core elements are built as the main floor, all under the common roof of a *university primary care centre*. The visualization of this concept is shown below as *Fig. 1*.

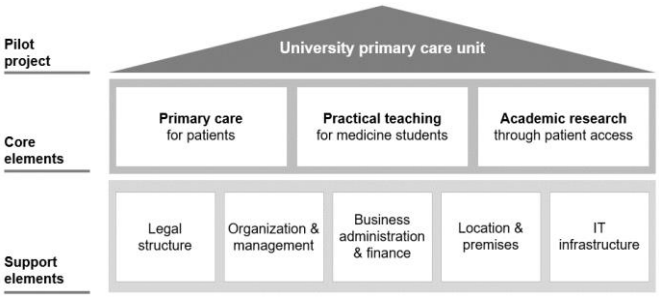

Figure 1. *Visualization of decision-relevant elements.*

In the following paragraphs, for each of the eight elements identified, relevant success factors and concepts are identified and discussed. Also, the question whether the establishment of a *university primary care centre* presents itself as fundamentally feasible is answered at the level of each element.

1. Patient care

According to the Austrian *primary care act*, patient-oriented goals which need to be met by every *primary care centre* include primary care close to patients' homes, good accessibility by public transportation, extended opening hours including non-office hours, reachability outside of opening hours in acute cases, integration of telephone- or web-based services, administration of home visits, guarantee of continuity for patients, accessibility for persons with a disability, measures to mitigate language barriers, availability of required medical(-technical) equipment, and participation in preventive, screening and integrated healthcare programmes. The services to be provided in particular have to include the provision of primary care to paediatric, elderly, chronically ill, and multimorbid patients as well as psychosocial healthcare, drug monitoring, health promotion, and disease prevention. In a healthcare concept, which must be prepared when

establishing a *primary care centre*, those patient-oriented aspects need to be demonstrated and discussed in the light of the region to be served. [7]

In addition to the patient-oriented aspects listed above, a *university primary care centre* can contribute to patient care by attracting medicine students into the field of general medicine, hence securing the next generation of general practitioners. This is the case because, on the one hand, work in a group practice is considered favourable by aspiring practitioners. On the other hand, a significant share of medicine students wishes to work in academia, some of which could potentially be interested in a career in general medicine if teaching and research formed an integral part. Overall, the establishment of a *university primary care* centre can be regarded as fundamentally feasible, and even advantageous, from a patient-oriented perspective. [1,2,3,9]

2. Practical teaching

Practical teaching forms an integral part of the human medicine curriculum. Throughout the first five years of their education, medicine students at *JKU* take practical seminars organised by the *Institute of General Practice* in the extent of 1 ECTS per semester. In the sixth and final year, students complete a *clinical-practical rotation* of which four weeks are spent in the field of general medicine. Of the mandatory twelve weeks of clinical traineeships, which must be done during the first ten semesters, four weeks are recommended to be spent in the field of general medicine, which is currently rewarded with a scholarship of 400 euros. Multiple studies suggest that the exposure of students to general medicine, in particular through practical experiences, increases the likelihood of them taking up a career in this field. [2,3,9]

Through the establishment of a *university primary care centre*, the complexity and effort of organising practical teaching can be expected to decrease due to the generally close collaboration. Additionally, increased patient contact, deeper insights into practice work, and new formats might be offered to students. Therefore, a *university primary care centre* can be confirmed to be feasible and advantageous from a teaching perspective.

3. Academic research

Academic research in the field of general medicine can be regarded as currently underdeveloped, even though it can contribute to improved patient care, the attractiveness of the field to aspiring practitioners, and the motivation of practising doctors. The forming of research networks involving several practices, such as the Norwegian *PraksisNett*, represent one viable way to improve research at the primary care level. Also the *Institute of General Practice* is currently conducting research via a network of practices, however with comparatively high coordination effort. [5,9]

With the implementation of a *university primary care centre,* access to patients for research purposes at the primary care level can be expected to be more easily possible due to the close collaboration between the university and the practice, thereby likely reducing coordination effort and enabling a quantitative and qualitative increase in research. Therefore, the feasibility and advantageousness can be confirmed from this perspective.

4. Legal structure

In the *Handbook for Founding a Primary Care Unit*, the legal form of organization, employment relationships, and contracts with external partners are identified as decision-relevant factors from a legal perspective. According to the Austrian *primary care act*, a *primary care centre* can be founded as either a *group practice* or an *independent outpatient clinic*. The former must take the legal form of a *limited liability company* whereby admissible shareholders are healthcare professionals with a right to work self-employed, such as doctors and certified nurses, who work in the *primary care centre* full-time. The majority of shares must be held by doctors, though. An *independent outpatient clinic* is subject to stricter, more complex regulations since the *hospital act* applies instead of the *practitioners' act*; however, with reliefs and exemptions. In this case, the legal form can be chosen freely but only non-profit healthcare organizations and public institutions can be proprietors. Employment relationships can take the form of salaried employment, independent contractors, and management contracts. Depending on the concrete contractual specifications, independent contractors can either be liable for the delivery of agreed-upon results or the sheer delivery of work at a reasonable level of effort. Factors determining the mix of employment relationships include costs, availability of workers, flexibility, and personal preferences. The most significant contract with an external partner is the *primary care contract* which is agreed upon between the *primary care centre* and the social insurance, within the options depicted by the federal *primary care contract framework*. It determines the *primary care centre*'s services and the remuneration from the social insurance. Other relevant external contracts comprise a potential rental agreement, financing contracts, and supply agreements. [6,7]

As a public institution, the *Institute of General Practice* could become proprietor of the *university primary care centre* if the legal form of an *independent outpatient clinic* would be chosen. However, in consideration of the respective regulations, the *Institute of General Practice* envisions the form of a *group practice*. In this case, the ownership of the *university primary care centre* is independent from the institute and the collaboration is solely based on contractual agreements and organizational integration, which appears to be sufficient. In any case, contractual agreements between the two parties are necessary, stipulating each party's responsibilities, services, and remuneration, particularly with regard to teaching and research. Considering the legal perspective, the *university primary care centre* appears to be fundamentally feasible.

5. Organization and management

According to the *Handbook for Founding a Primary Care Unit*, the team of employees, the service portfolio, and the structural and process organization are the main decision-relevant factors regarding the organization and management of a *primary care centre*. The *primary care act* requires each practice to have a core team which must consist of two general practitioners and one certified nurse, as a minimum

requirement (except for dedicated paediatric practices which can have two paediatricians instead of general practitioners). Additionally, the core team can comprise paediatricians and administrative assistants. In the extended team of a *primary care centre*, persons of the following professions can be integrated: nutritional science, occupational therapy, psychology, midwifery, logopaedics, physiotherapy, psychotherapy, social work, massage therapy, medical technology, and gynaecology. If a respective necessity can be proven, a *primary care centre manager*, with professional expertise in business and management, can be hired at the expense of the social insurance to support the founding and operation. Beyond the borders of the own organization, cooperations with external partners, such as pharmacies and laboratories, can be set up. The required quantity of persons of the different professions is contingent to the aspired service portfolio and opening hours, which must add up to at least 47 hours per week on all five workdays also including non-office hours in the morning and in the evening. *Structural organization* describes the allocation of roles and responsibilities among the team of the *primary care centre*, hence creating a hierarchy. This is typically depicted in an organigram. *Process organization* describes the workflow of tasks, defining the trigger, the person in charge, the tools, and the timeframe, amongst other parameters. Processes can be divided into management processes, core processes and support processes and are typically depicted in a process landscape. In the application process, all of the parameters discussed in this chapter must be set down in a detailed concept and reflected in the light of to the region to be served. [7,8]

In the *university primary care centre*, the cooperation with the *Institute of General Practice* should be reflected in the organigram and process landscape, showing the involvement of members of the institute and defining relevant processes, in particular with regard to teaching and research. A designated *primary care centre manager* could, aside of his or her *usual* responsibilities, also act as contact person and interface to the university. In order to additionally integrate the two organizations and facilitate cooperation, personnel could be deployed in both the *Institute of General Practice* and the *university primary care centre*. For example, a doctor working as a lecturer and researcher at the institute could also practice at this *primary care centre*. Overall, the fundamental feasibility can be confirmed from an organizational perspective.

6. Business administration and finance

Decision-relevant aspects in the field of business administration and finance include investments, financing, and operational profit, according to the *Handbook for Founding a Primary Care Unit*. The interplay of those factors must be described and depicted based on projections in a *finance plan* which itself forms an integral part of the *business plan*, giving an overview of the whole business concept. The most important ways of representation of financial information are the cash-flow statement, the income statement, and the balance sheet. Investment costs with regard to the founding of a *primary care centre* comprise costs for buying, adapting, and/or furnishing the premises, costs for the acquisition of equipment, machines, and vehicles, costs for legal, tax, architectural, and business consulting, notary costs, stamp-duties, and up-front costs for salaries. In order to be able to pay those costs when due, adequate financing is needed. Capital contributions from the proprietors, loans, and grants typically form the long-term side of financing. For the legal form of a *limited liability company*, 35,000 euros are legally required as capital contributions which represent the company's minimum equity. However, larger capital contributions may likely be necessary in order to fill the financing gap between the investment costs and the funds acquired through loans and grants. Loans are usually taken out at banks but also loans from other organizations or persons are possible. Grants are non-repayable funds usually granted by public bodies in order to promote desired actions. The most significant one currently available is funded through the EU's *Resilience and Recovery Fund* and reimburses Austrian founders of a *primary care centre* with 50% of the initial investment costs up to an investment sum of 3,200,000 euros, with the specific intention to promote the expansion *primary care units* in Austria. *Operational profit* refers to the difference between revenues and costs occurred in the business operation. Different remuneration models for medical services provided are available to be chosen from. [6,7,8]

Considering the high degree of innovation and benefit for the public, a *university primary care centre* might qualify for additional grants or supported loans. The provision of practical teaching and academic research can be expected to result in increased investment needs due to higher spacing requirements and additional equipment. Also, the time spent on teaching and research can be expected to result in additional personnel costs and/or loss of revenues. Therefore, the services provided by the *university primary care centre* to the university, and vice versa, need to be remunerated based on contractual agreements. From a financial perspective, it can be confirmed that the founding and operation of a *university primary care centre* appears to be fundamentally feasible.

7. Location and premises

According to the *Handbook for Founding a Primary Care Unit*, decision-relevant factors regarding location / premises primarily include the selection of a suitable location and the planning of the interior and facilities. The location selection process is determined by the *regional structural plan for healthcare* and the *practice plan* which represent public specifications where practices can be established. Within the regulatory specifications, the concrete location can be chosen based on the following regional criteria: demand potential, competition, infrastructure, transport connection, agglomeration factors (i.e., regional cooperation partners, such as pharmacies and laboratories), staff recruiting potential, availability of premises, availability of regional funding, and personal preferences of the founders. The planning of the premises is recommended to be done via *room and function programs* which are based on detailed guidelines determining the quantity, spacing and figuration requirements for different areas, such as doctor's rooms, therapy rooms, waiting rooms, reception areas, personnel facilities, offices, sanitary facilities, utility rooms, and hallways, in the light of the envisioned service portfolio and projected number of patients. [6,7]

It is to be expected that specific requirements on the location and premises arise for *a university primary care centre*. Concretely, its location should be in close proximity to the university premises in order to facilitate the collaboration on teaching and research. According to the current planning status of the pilot project, the establishment in direct proximity to the university is likely not feasible due to the already sufficient availability of primary healthcare in this region. However, close-by regions in the town of Linz, which are easily accessible by public transport from the university, are undersupplied and hence offer the opportunity to set up a *primary care centre*. In the *room and function program*, the presence of students and researchers should be factored in. This could, for instance, be achieved by planning doctor's rooms with larger floor space and additional furniture to accommodate students. Also, the planning of additional rooms designated to seminars for students and research activities may be sensible. It can be concluded that, fundamentally, a *university primary care centre* appears to be feasible from the perspective of its location and premises.

8. IT infrastructure

The *Handbook for Founding a Primary Care Unit* recommends that through the specification of an IT architecture, the necessary IT components are attributed to different software solutions which often include several components in one product. The planning but also the operation of the IT landscape can be regarded as complex and laborious which is why the involvement of (external) professionals is usually necessary. [6,7]

In the context of a *university primary care centre*, additional requirements to an IT structure are to be expected. Particularly, the collaboration with the *Institute of General Practice*, including the administration of practical teaching sessions for students and access for researchers, should be reflected in the IT landscape which could be achieved by creating interfaces to the university's IT systems or using additional specific software. Overall, the fundamental feasibility of a *university primary care centre* can be confirmed from an IT perspective.

Conclusion

According to this research, the fundamental feasibility in the context of a *university primary care centre* can be affirmed in all of the eight perspectives which were identified. For each of them, decision-oriented factors and concepts could be identified and discussed.

IV. Discussion

In accordance with the designated aim of this research, the findings provide a scientific basis upon which the *Johannes Kepler University*'s *Institute of General Practice* can build its pilot project – the establishment of Austria's first *primary care centre* which is integrated into a university. Since from all of the eight decision-relevant dimensions identified, the feasibility could be fundamentally confirmed, this can be regarded as a validation that the project is likely to be able to be successfully implemented and operated. Furthermore, due to its innovative approach, this pilot project can serve as a blueprint and case study for similar undertakings, in other parts of Austria but also beyond. Therefore, also, further research is recommended.

It is yet to be seen to which degree the *university primary care centre* will be able to tackle today's challenges concerning general medicine, such as the sufficient provision of primary care to patients, the administration of practical teaching for medicine students, and the access to patients for researchers in the field of general medicine. However, positive impacts in those areas are likely to be expected. Further research could substantiate those effects.

Acknowledgment

The authors gratefully acknowledge the support of the *Institute of General Practice* of the *Johannes Kepler University Linz* without which this research would not have been possible. Also, *SOLVE Consulting* is cordially thanked for providing invaluable guidance in the field of healthcare planning through access to their professional experts.

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Knowledge transfer in multidisciplinary teams in long-term care

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Abstract— **Care homes possess valuable knowledge regarding the care of older individuals and those with dementia, which is becoming increasingly relevant worldwide. The aging population has amplified the demand for care among older people, not only in institutions but also within the community. The significance of knowledge now assumes a new dimension concerning the quality of life. By effectively managing knowledge and facilitating knowledge transfer, quality of care can be extended to creation of new knowledge. This qualitative descriptive study explored experiences of knowledge transfer in multidisciplinary teams in care homes.**

***Index Terms*—knowledge transfer, long-term care, care homes, new knowledge**

I. INTRODUCTION

The classification of knowledge that we refer to in this paper views knowledge as explicit or tacit [1]). Explicit knowledge typically refers to knowledge that has been expressed in words and numbers. Such knowledge can be shared formally and systematically in the form of, for example, data, drawings, audio and video tapes, and computer programs [2]. Explicit knowledge in care homes represents documentation and records (about residents—their medical documentation, biographic stories, and care plans—employees, and different stakeholders), documented staff meetings and shift handovers, feedback mechanisms, care homes standards and procedures, care homes quality systems, books and training programs, care homes information technology, and data security and privacy. In contrast, tacit knowledge includes insights, intuitions, and hunches. This knowledge is difficult to express and formalize and therefore difficult to share. Despite written protocols, the knowledge contained in the implementation of the service is intertwined with the attitude of an individual caregiver to a resident. The key to quality care is often in undocumented information, including intuition, empathy, and experience, which enables us to make the right decisions, as Gamble and Blackwell [3] describe. Tacit knowledge is of great importance in delivering quality services because it is an essential part of creating relationships with residents, listening to them, and creating a domestic environment in a care homes. Tacit knowledge can be the most important element in promoting the well-being of care homes residents and maintaining the meaning in residents' lives. It is internalized in staff attitudes toward residents, in creating livability, in respecting residents' wants and needs, in person-centered care, and in the way staff feed, care for, and talk to residents. As it creates an important part of human capital that an organization does not own, it is strategically important to enable and foster knowledge transfer in care homes.

II. KNOWLEDGE TRANSFER IN CARE HOMES

Knowledge transfer is a fundemantal aspect of the knowledge management process as it enables sharing, validation, building upon existing knowledge and creation of new knowledge. The knowledge ecosystem highlights the significance of knowledge sharing and collaboration within an organization. When employees share their expertise and collaborate effectively, an organization's overall intellectual capital is strengthened [1,4]. As intellectual capital within an ecosystem flows and evolves over time, managers should facilitate the flow of knowledge among individuals, teams, and departments to maximize the potential of their organization's intellectual capital. The ecosystem perspective emphasizes that intellectual capital, when managed effectively, leads to creation of new knowledge, improved services and social innovations in care homes. Organizations that nurture their intellectual capital ecosystem are more likely to adapt to

changing circumstances, innovate, and achieve sustainable success.

Knowledge transfer processes between stakeholders are mediated by the interests of the relevant parties [5], so they must be aware of the value that is generated. The results show that they have a high interest in sharing knowledge, but there are barriers that affect the transfer of knowledge in care homes. The facilitators and barriers to implement knowledge transfer in care homes are different and are depending on the type of the knowledge transfer.

Various knowledge transfer practices have been introduced at care homes to encourage the transfer of knowledge between generations and to new employees. These include various organizational measures, such as mentoring; working in pairs; consistent education in care home; teamwork; daily meetings during shift changes; and activities to improve communication and create a safe and stimulating work environment (e.g., adhering to the maxim of respectful communication between all stakeholders, daily team meetings, and the use of modern information technology, such as a computer system where all changes and events for each resident are recorded). An important factor in the transfer of knowledge between employees and residents is a relationship based on trust and mutual respect. If care home include relatives in daily activities and they are regular visitors to care home, a partnership relationship can be created between employees and relatives whereby everyone works hard for the well-being of residents. The partnership relationship is based on immediate and clear communication between employees and relatives. Relatives expect real-time notifications about any changes in their loved one's health, and they also expect to be heard. After all, they have taken care of their loved one for many years and know what contributes to their well-being.

Barriers to the Implementation of Knowledge Transfer in care homes are some general, like lack of staff and long-living society with increasing demand of care homes, as individual to each care home, depending on the organization's culture and knowledge management practices: Factors that can hinder the transfer of knowledge in care homes are a lack of staff, which contributes to haste, more frequent changes in employees, and shallower relationships in a team and with residents and relatives. Information technology can enable the transfer of knowledge, but it may be avoided or used infrequently by older employees. The transfer of knowledge in the knowledge ecosystem of employees, residents, and relatives can also be affected by dementia, which is present in almost two-thirds of CH residents. Exceptional situations, such as the Covid-19 pandemic, can also have a negative impact on the transfer of knowledge, as the period of crisis management lasted for a year, with frequent restrictions or bans on resident visits.

III. Material and Methods

Qualitative data was obtained with the use of the data gained from interviews of 11 caregivers and 5 members of expert team. Semi-structured interviews with them were conducted in 2023 in 2 care homes in Slovenia. The interviews were transcribed and analyzed by qualitative analysis in a process where units (parts of sentences, sentences, or whole paragraphs) of analysis were identified first, and then open codes were defined for each part. Qualitative comparative analysis was used to assess the attitudes. We applied the questionnaire from Donate & Sanchez de Pablo on the role of knowledge-oriented leadership in knowledge management practices and innovation [6]. Research question was:

Does the way knowledge is transferred within the same home differ by unit - a professional team or a home care unit?

IV. Results

In the research, we conducted interviews with social care workers who provide home care and are present in the care home only at the beginning and end of the work shift, and in their work they are much more independent and left to their own knowledge and judgment. We were interested in whether the methods of knowledge transfer among social care workers in the home help unit differ from the methods of knowledge transfer in a professional team, where the members are a physiotherapist, an occupational therapist, a registered nurse and a social worker.

Formal transfer of knowledge

The social workers meet face-to-face about once a month. All indicate that they communicate with the coordinator mainly by phone, but also live a few times a month. They indicate that they receive certain information from the coordinator and important news from the director. All information and events are regularly shared with the coordinator at monthly meetings. Social caregivers say that they can share their experiences and bring up their problems at the monthly meetings. Most indicate that they share their experiences with the coordinator when a particular situation arises. Some call the care home's care manager. Most of them indicate that they also share their experiences with the mentoring service at their facility

The social care workers indicated that they all use cell phones in their work. They use them to communicate with the coordinator, with each other, with the sponsorship service and with the relatives of the users. In addition, they also have an application on their cell phones that they use for work (recording hours) and using schedules. All caregivers indicated that they communicate their suggestions to the coordinator, who then helps to implement the suggestion, adjust it, or forward it to the director. Some indicate that they feel they can always approach the coordinator or director with their ideas. Most of the users' requests and suggestions are forwarded to the coordinator so that they can review the proposal together.

The social care workers say that they share their knowledge with each other during meetings. Most experiences and knowledge are also shared through internal trainings that take place in the organization. Some say they also attend external trainings where they gain new skills. Some point out that they

also gain new knowledge by calling the coordinator, visiting nurse, or nursing home director.

Informal transfer of knowledge in home care

They share their experiences informally at monthly meetings. Some indicated that they meet once a week during a break with colleagues from the same community and share what is happening in their area.

Some indicated that they also use the social networks Facebook and WhatsApp for communication. They all communicate with each other by phone, and occasionally in person. Those who work in the same community occasionally meet informally and share information.

Formal mechanisms for sharing practices in care home

The members of the professional team indicate that they share their experiences during team meetings when it comes to interdisciplinary collaboration; in the professional council; during lunch; during the day when talking with colleagues directly in the department or during morning coffee or after work; through internal trainings; written reports; individual conversations.

It was pointed out that the proposals should be submitted to the social worker, the head of the center, the mailbox at the reception (the proposals are reviewed by the head), colleagues or the head nurse. They are also submitted on the basis of a professional report, which is carried out twice a day to provide information about changes in the health status of residents or other important factors that may affect the well-being of residents.

Knowledge sharing takes place at meetings, training sessions, distribution of professional literature, experiential workshops, presentation of reports, assets, and continuing education. They also acquire knowledge from colleagues, the nursing supervisor, the social worker and internal trainings conducted by the center's staff. Information is obtained through the Internet or exchanges between employees (expert teams, reports, expert councils, individual meetings), information is posted on the bulletin board, through the work disk.

The members of the expert team unanimously reviewed the proposals. Sometimes the proposals are considered, sometimes not, the proposals are considered at the level of the expert team and unanimously adopted, taking into account the impact of decisions on residents. The proposals are reviewed, discussed and heard by the expert teams.

The members of the expert team stated that in their work they use computers, telephones, the Internet, the program PRO-BIT, videos on YouTube and e-mail. They communicate with each other by phone, reports (transmission of daily information), weekly meetings (meetings of the expert team). They also transmit information to each other by phone or call when it is urgent and quick transmission is needed.

The members of professional team is informed through computer records and transmission of information in reports, and that much of the information is transmitted during team meetings. They receive monthly reports on progress and changes through quality report. They are informed of changes via e-mail or by the director at team meetings. Much information is also obtained through social media, such as Facebook.

It was pointed out that information is often incomplete and shared "just in time."

Informal transfer of knowledge in professional team

They also communicate via e-mail and one-on-one meetings. They also often share information in informal ways, such as over morning coffee or via Facebook.

V. Discussion

The results of the qualitative analysis of interviews conducted with social workers and members of the professional team point to important findings in our research:

1. both units emphasize the importance of real-time communication with leadership (coordinator, nursing supervisor, director) to help make a decision when there is ambiguity. Being informed about the health status and changes among the residents and users of the home care service is also crucial for successful and safe work in a care home. Meetings are therefore held twice a day at the care home, where they provide information about changes and any factors that may affect the residents' well-being.

2. The frequency of regular meetings is much lower in home care - caregivers even mention meeting only once a month. In home care, social caregivers are much more on their own in providing all services - in a care home, for example, they have nurses as professional help, members of the professional team, doctors - on the ground, in the home environment, social caregivers are on their own and left to their own knowledge, experience and resourcefulness.

3. Information technology is an important tool for knowledge transfer. Again, this varies from unit to unit. In the care home, staff refer to the computer program as the basic tool into which all the information about residents' health is entered. Since everyone works in the same place, it is much easier to coordinate spontaneously (in offices, hallways, or on the phone). However, in the home care unit, a different technology was used. Given the nature of their work, a computer program, even if available to them, is of little use to them. The social care workers mainly mention the use of the telephone - where they consult with the coordinator, the head nurse or each other.

4. It is not surprising, then, that social care workers are much more likely to use informal ways of transferring knowledge - sharing information, experiences, and ideas after meetings, during their breaks, through social networks, and by phone.

Given the much smaller number of regular meetings, it is necessary to find ways to provide quality home care services also through the care home, i.e., formally, with timely help, advice, or ideas. It would be useful to introduce at least weekly rather than monthly meetings, as meetings are an important way of transferring knowledge. If they have professional dilemmas, they could always contact the home's nursing supervisor or

another professional. There are many possibilities for improvement, such as the inclusion of social care workers in trainings that take place in care homes or visits by professionals in the home environment of care home users.

The importance of our findings for future research knowledge transfer in care homes and home care environment

By researching and applying modern management skills, we can contribute significantly to better and continuous information and knowledge transfer, thus improving the quality of services. In doing so, we can make use of modern information technologies as well as consultation with professionals in the home environment of the users. Like any study, ours has certain limitations, such as a larger sample size that could confirm our findings.

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Possibilities for further developing of the "Careful Assessment" tool in the treatment of patients with medically unexplained conditions

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***Abstract* - Medically unexplained symptoms (MUS) are difficult to define as a clinical entity. In practice, the most widely used definition is that MUS patients are those who complain of physical symptoms for which no organic or psychiatric cause is found after numerous investigations. Early identification of patients with MUS is crucial both for the patient and for the primary care physician, who is a central player in the long-term management of such patients. The aim of the qualitative analysis was to create a paradigmatic model that will be presented as a starting point for a possible redesign of the "Careful Assessment" tool and, consequently, for the improvement of the learning process for family medicine trainees (FMT), which are linked to the management of patients with MUS in Slovenia.**

Methods: Using a nominal group technique, we generated codes (answers), subcategories, categories and set priorities. Subcategories were grouped into categories. Three categories were discussed: the advantages of the tool, the disadvantages of the tool and possible improvements to the "Careful Assessment" tool.

Results: The study generated 79 ideas/codes. These were grouped into 12 sub-categories, which in turn were grouped into three categories - the advantages of the tool, the disadvantages of the tool and suggestions for improvements to the tool. The category *suggestions for improvement* received the highest total number of votes (82), with five sub-categories. When discussing the category advantages of the "Careful Assessment" tool, most of the responses fell into the subcategory of the positive features of the tool (enables a systematic approach and holistic treatment, is a structured tool, etc.). When discussing the category disadvantages of the "Careful Assessment" tool, the most frequent responses were about the negative features of the tool (time-consuming, multiple uses are required, etc.) and the weaknesses of the tool from the patient's point of view (dependence on the sincerity of the patient, requires invasion into the patient's privacy, etc.). In category possible improvements to the "Careful Assessment" tool, two subcategories (additional content for predisposing factors and additional content for perpetuating factors) received the most votes.

Conclusion: More research on MUS in primary care is needed to improve the consultations with patients and management of the disease. The "Careful Assessment" tool can be of great help in diagnosing MUS, but it has many drawbacks. This research has provided us with a number of suggestions for improving the tool.

***Index Terms* - Careful Assessment tool; medically unexplained symptoms, family medicine; family medicine trainees; qualitative studies**

I. INTRODUCTION

Approximately 20–25% of patients in a family medicine practice complain about physical symptoms for which no cause can be identified – medically unexplained symptoms (MUS) (1). Most commonly, they report fatigue, dizziness and general malaise (2). These patients frequently return to their family doctors for appointments and want the doctors to do additional tests and refer them to specialists (3). After years of follow-up, an organic cause for the patient's problems is found only in 10% of cases (4).

Patients with MUS are commonly a reason for frustration and dissatisfaction of family doctors, while such patients themselves are not satisfied with how they are being treated (5). Using a biopsychosocial model, which focuses on the sick person, helps family doctors better understand patients with MUS than the biomedical model, which is focused on the disease (6). Doctors also face the challenges of making a diagnosis according to the ICD-10 classification, since they do not want to stigmatise patients and thus cause additional problems (7).

When managing patients with MUS, doctors often use various tools and methods. These mostly involve standardised questionnaires (2,8), comprehensive psychological theories and approaches (9), and qualitative techniques of data collection such as interviews or focus groups (6,10,11). Through their results, the above studies aim at standardising the MUS identification procedure in primary care patients (12). An example of such useful tool is also the "Careful Assessment" tool based on the "P-P-P" model (predisposing factors, precipitating factors and perpetuating factors) (13). According to this model, certain events occurring in a patient's life may influence the disease – they may lay the foundations for the disease, trigger it or maintain it (13).

The aim of the qualitative analysis was to create a paradigmatic model with main ideas, that will be presented as a starting point for a possible redesign of the "Careful Assessment" tool and, consequently, for the improvement of the learning process for family medicine trainees (FMT), which is linked to the management of patients with MUS in Slovenia.

II. METHODS

In our qualitative study, the nominal group technique was used. This is the type of study that determines the selection, collection and analysis of data during the research process (14). Manual coding was used, the answers of FMTs were analysed, and codes were prepared which could be logically linked and subsequently joined into subcategories and categories (higher-level codes) (14).

Participants – We analysed work of the nominal groups, which involved FMTs from seven modular groups (modular groups No. 17, 18, 19, 20, 21, 22 and 23). There was a total of 184 participants. They had undergone training between 2016 and 2018 within the Medically Unexplained Symptoms training module (part of the mandatory training within the family medicine specialisation).
For the needs of our study, findings of each nominal group were anonymised so that the identity of any FMT could not be linked to the findings of each nominal group. FMTs were in 29.9% male (n=55), 60.9% (n=112) female, and 9.2% (n=17) did not answer this question. Regarding the location of the practice, they work at, 26.6% (n=49) work in a city, 40.2% (n=74) in a town, 16.8% (n=31) in rural areas, and 16.4% (n=30) did not answer this question. The majority, 76.0% (n=140), are employed at a public institution, 17.9% (n=33) at a concessionaire (private health practice or private health institution with contract with Health Insurance Institute of Slovenia which provide compulsory health insurance in Slovenia), 1.6% (n=3) at a private practice without concession, and 4.5% (n=8) did not answer this question. The average number of years FMTs spent working in family medicine was 3.3 years (minimum 2 years, maximum 8 years). The FMTs who took part in the study came from different regions of Slovenia, which allowed us to obtain a broad sample.

Data collection and qualitative methods – As the data collection method, the records of FMT findings during their work in nominal groups were used. The nominal group technique involves purposeful gathering of participants for discussion and brainstorming on a specific topic (15,16).
The procedure comprised four phases: generating ideas to improve the "Careful Assessment" tool, writing these ideas down, explaining and voting on the priority ideas (17). This method encourages involvement of all participants, as it enables equal participation (17). Additionally, it is a structured, transparent and repeatable method for synthesising and generating ideas (17).
Ideas were generated by encouraging discussion – within their respective modular groups, the participants were distributed in smaller groups (3–4 participants each) and had 10 to 15 minutes to discuss proposals for improving the tool. Each smaller group then prepared a shortlist of the most important findings. All of the most important findings from the groups were collected and recorded. If the findings were repeated, they were numbered. The explanation and interpretation of all collected ideas followed. The moderator recorded the votes, counted them, calculated their rank and prepared a final list.

Data analysis – Head of module (V.I.) counted the votes for each finding separately. This resulted in a list of ideas for improving the "Careful Assessment" tool, arranged by the number of votes (rank). Based on the frequency of votes (rank), the content was analysed by two independent investigators (V.I and E.S.Š.). After each analysis, the investigators met and reviewed codes, harmonising them if needed. This increased the reliability and consistency of the analysis. The aim of the analysis was to develop analytical subcategories, categories and theoretical interpretations from the text based on the ideas obtained. In the next phase, the investigators classified and combined the obtained ideas (codes) independently of each other. This part of the analysis resulted in the formation of final subcategories and categories.

Opinion provided by the Ethics Committee – The retrospective study, using already existing data from FMTs educational training program (2016-2018) was approved on 3rd of June 2021 by the National Medical Ethics Committee of the Republic of Slovenia (application No. 0120-210/2021/3).

III. RESULTS

Within seven modular groups, 184 FMTs were divided into 37 smaller groups (3–4 participants in each group). Within each group, the FMTs discussed the questions asked and gathered ideas.
There was a total of 79 ideas (codes). They were ranked according to the number of votes. The following ideas obtained the most votes: *It is time-consuming, Allows for a systematic approach, It is a structured and useful tool, Allows for a comprehensive management, Depends on the patient's sincerity, Family predisposition should be added to susceptibility, Motivational techniques for behavioural cognitive change, Prepare a tool for patients, Not enough perpetuators, Better patient understanding, Add more items for all three factors …*
All answers are shown in Table 1.

Based on the content analysis and the identified ideas (codes), 12 subcategories were formed (Table 1).

Table 1: Subcategories formed based on the ideas (codes)

SUBCATEGORIES	Rank	No. of votes	Total no. of votes per subcategory
Positive features of the "Careful Assessment" tool			**37**
Allows for a systematic approach	2	11	
Structured and useful tool	3	10	
Allows for a comprehensive management	4	10	

	New, easier approach	20	3	
	Tool requires accuracy	47	1	
	Allows for validation of changes	50	1	
	Helps to objectivise the condition	52	1	
Negative features of the "Careful Assessment" tool				**28**
	It is time-consuming	1	19	
	Multiple uses are required	26	3	
	Too general tool	28	2	
	Careful Assessment is not a suitable name	54	1	
	Not a tool adjusted for several visits	56	1	
	Not a systematic tool	57	1	
	Poorly structured	61	1	
Positive influence on the doctor				**22**
	Better patient understanding	10	5	
	Tool makes us consider MUS	12	5	
	Increases doctor satisfaction	14	4	
	Helps the doctor to make a diagnosis	19	4	
	Improves the doctor-patient relationship	44	2	
	Higher doctor tolerance	49	1	
	Better recognition of psychiatric diseases	51	1	
Weaknesses from the patient's point of view				**21**
	Depends on the patient's sincerity	5	7	
	Lack of patient self-criticism	15	4	
	Requires invasion into the patient's privacy	16	4	
	Patient's reservations	29	2	
	Less satisfied patient	43	2	
	Excessive patient attachment	58	1	
	Depends on the patient's cognitive abilities	60	1	
Changes regarding predisposition				**20**
	Family predisposition/history should be added to susceptibility	6	7	
	Personality type should be added to susceptibility	17	4	
	Peer violence should be added to susceptibility	37	2	
	General pool skills should be added to susceptibility	38	2	
	Education should be added to susceptibility	39	2	
	Traumatic event should be added to susceptibility	72	1	
	Preserving unhealthy relationships should be added to susceptibility	73	1	
	School abuse should be added to susceptibility	74	1	
Changes regarding perpetuators				**20**
	Not enough perpetuators	9	6	
	Dependencies (alcohol, smoking, relationships) should be added to perpetuators	21	3	
	Chronic somatic diseases/physical disabilities should be added to perpetuators	32	2	
	Family relationships and work relationships should be added to perpetuators	36	2	
	Lack of expert help should be added to perpetuators	46	2	
	Access to unverified information should be added to perpetuators	75	1	
	Unemployment should be added to perpetuators	76	1	
	Specialist referrals should be added to perpetuators	77	1	
	Changes in body weight should be added to perpetuators	78	1	
	Lifestyle should be added to perpetuators	79	1	
General suggestions to improve the "Careful Assessment" tool				**19**
	Motivational techniques for behavioural cognitive change	7	7	
	Add more items for all three factors	11	5	
	Clearer boundary between perpetuators and triggers	30	2	
	Check the frequency of visits to the practice	66	1	
	Include heteroanamnesis	67	1	
	Add a brief description of family environment	68	1	
	Limitation regarding cognitive abilities	69	1	
	Check the frequency of sick leave	71	1	
Improving structural characteristics of the "Careful Assessment" tool				**15**
	Prepare a tool for patients	8	7	
	Abbreviated version/tool simplification	23	3	
	Change the tool into a 1–10 rating scale/yes*no questionnaire	35	2	
	Prepare a tool for registered nurses	40	2	
	Additional heading: Solution	70	1	

Positive influence on the patient				**15**
	Increases patient satisfaction	13	5	
	Patient activation	24	3	
	Patient's insight into MUS	25	3	
	Conversation as a therapeutic effect	45	2	
	Patient-centred	48	1	
	Increases doctor-patient trust	53	1	
Content-related weaknesses of the "Careful Assessment" tool				**11**
	Not knowing what to do with the information obtained	18	4	
	No specific instructions when to start using it	42	2	
	Triggers overlap with perpetuators	55	1	
	Predisposition goes beyond childhood	59	1	
	Usefulness for one's own patients only	62	1	
	Too general triggers	63	1	
	Mandatory exclusion diagnostics	64	1	
Changes regarding triggers				**8**
	Newly diagnosed chronic somatic disease should be added to triggers	31	2	
	Way of coping with stress should be added to triggers	32	2	
	Parents' expectations should be added to triggers	33	2	
	Being different should be added to triggers	34	2	
Weaknesses from the doctor's point of view				**5**
	Effectiveness depends on the doctor's skills	27	2	
	Doctor's decompensation	41	2	
	Risk of strengthening MUS	65	1	

Most ideas (codes) were classified into the subcategory *Positive features of the "Careful Assessment" tool,* followed by *Negative features of the "Careful Assessment" tool, Positive influence on the doctor* and *Weaknesses from the patient's point of view*. All subcategories and ideas (codes) are shown in Table 1.

The subcategories that could be logically linked were then combined into categories (higher-level codes). Three categories were created: Advantages of the tool, Weaknesses of the tool, and Suggestions for tool improvement (Table 2).

Table 2: Categories (higher-level codes) created based on subcategories.

CATEGORY	Total no. of votes per category	SUBCATEGORY	Total no. of votes per subcategory
SUGGESTIONS FOR IMPROVEMENT	82	Improving structural characteristics of the "Careful Assessment" tool	15
		General proposals to improve the "Careful Assessment" tool	19
		Changes regarding susceptibility	20
		Changes regarding triggers	8
		Changes regarding perpetuators	20
ADVANTAGES OF THE TOOL	74	Positive features of the "Careful Assessment" tool	37
		Positive influence on the doctor	22
		Positive influence on the patient	15
WEAKNESSES OF THE TOOL	65	Negative features of the "Careful Assessment" tool	28
		Weaknesses from the doctor's point of view	5
		Weaknesses from the patient's point of view	21
		Content-related deficiencies of the "Careful Assessment" tool	11

The following category received the most votes for ideas (codes): *Suggestions for improvement*, which was created based on the logical combination of five subcategories (Table 2).

IV. DISCUSSION

Category: Suggestions for improving the "Careful Assessment" tool – In the "Careful Assessment" tool, susceptibility is affected by chronic childhood diseases, childhood abuse and/or neglect, childhood poverty, poor social support. Considering the study, much more factors should be included: *personality type, family predisposition, peer violence, school abuse, level of education, traumatic events in childhood, maintaining unhealthy relationships*. Our findings have also been confirmed by Lamahewa et. al., who showed that women, patients with severe symptom burden, patients with physical abuse in childhood, and those with low income have poorer prognosis(18). In their study, Dwamena at al. concluded that almost as a rule, patients with MUS reported a current and/or past family dysfunction in their lives(10). Many participants in our study thought that there were not enough perpetuators (reduced body weight, body weight gain, social withdrawal, and decreased self-confidence) recorded. The study showed that *dependencies (alcohol, smoking, relationships), physical disabilities and chronic somatic diseases, lifestyle, relationships in family and at work, lack of expert help, unemployment, access to unverified information,*

specialist referrals to additional tests should also be included.

Category: Advantages of the "Careful Assessment" tool – The study found that the tool has a *positive influence on the doctor* – the patient is in the centre of attention, conversation has a diagnostic and therapeutic effect, doctor-patient trust is increased. Other studies also emphasise the importance of a good doctor-patient relationship for successful treatment of MUS (18). Rasmusen et al. also demonstrated the significance of the biopsychosocial model approach (6).

A strong emphasis in the **category: Weaknesses of the "Careful Assessment" tool** was on the patient's point of view. The patient's sincerity is essential for a successful use of the tool, and invasion into the patient's privacy is significant, which is often a problem. Salmon et al. conducted a prospective study showing that the patients who wanted emotional support talked more about psychosocial problems, including the psychosocial causes of symptoms and the need for psychosocial help (19). On the other hand, the patients who wanted an explanation and reassurance themselves proposed to explain the symptoms with physical changes (19). In this category, the doctor's point of view was also emphasised – the success of treatment depends on the doctor's skills. Stone also showed that negative emotions and lack of diagnostic expertise prevented the doctors from effectively managing patients with MUS (12).

Advantages of the study – The data collected in our study were analysed using quantitative analysis and nominal group work. The advantage of such a study is a detailed insight into the FMTs' opinion regarding the improvement of the "Careful Assessment" tool. The study constitutes a foundation for further studies in the field of MUS diagnostics, and is also suitable for use in routine clinical practice. The study involved a large sample of participants, allowing us to obtain many new ideas. The advantage of the study is also its originality.

Weaknesses of the study – As a weakness of the study, it should be noted that younger doctors (FMTs) participated, who are at the beginning of their career and are therefore less experienced. It is also difficult to exclude subjectivity of the participants, especially regarding the methodology of a qualitative study.

The study took place in Slovenia, with doctors working within the Slovenian healthcare system. Since each country has its own healthcare system, it is difficult to generalise and conclude that a similar study conducted in other healthcare systems would show the same results.

V. CONCLUSION

The "Careful Assessment" tool is only one of the potential approaches to manage patients with MUS. With such and similar tools and by means of an appropriate therapeutic approach, we want to change the patient's beliefs, thus allowing them to better understand the possible causes of their problems and more willingly accept the problems. Our study provided many suggestions for improving the tool (improving structural characteristics of the tool, changes regarding susceptibility, triggers and perpetuators), and highlighted the advantages of the tool (positive features of the tool, positive influence on the doctor and also the patient) and weaknesses of the tool (negative features and content-related disadvantages of the tool, weaknesses from the doctor's point of view and also the patient's point of view).

Our findings constitute a good foundation for future studies on the topic of improving the management of patients with MUS and further development of the "Careful Assessment" tool.

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Specialized registered nurses' contribution to the reduction of diabetic complications

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***Background*—Worldwide the number of people with diabetes is increasing. In Slovenia, it was estimated that the prevalence of diabetes in 2021 was 145.200 people. With the increasing prevalence of diabetes, there is also a rising need to manage and control the disease. In Slovenia, specialized registered nurses at general practice offices monitor people with well-managed diabetes and accordingly contribute to reducing the frequency of complications. One of the common complications of diabetes is amputation of the leg above the ankle. Therefore a foot examination and education of patients have been included in the annual check-up of diabetic patients in general practice. We were interested in whether introducing routine foot examinations in diabetic patients has reduced the prevalence of amputations above the ankle.**

***Methods*— Retrospectively we analyzed the existing data on amputations above the ankle in diabetic patients and yearly foot examination frequency in diabetic patients during the period 2015–2019.**

***Results*— Results clearly show that the number of amputations above the ankle is decreasing, when the number of yearly foot exams is increasing.**

***Conclusions*— Specialized registered nurses play an important role in the early detection of complications of diabetes, including diabetic foot. Since diabetes is a lifelong disease, the actual effectiveness of the work of specialized registered nurses in reducing complications in chronic patients will be observed in the future.**

***Index Terms*— amputations, diabetes, foot examination, general practice, primary care.**

I. Introduction

Diabetes is one of the most common noncommunicable diseases worldwide [1], and the number of people with diabetes is increasing [2]. In Slovenia, the estimated prevalence of diabetes in 2021 was 145,200 people [3]. The prevalence of diabetes is the number of people diagnosed with diabetes in the last 12 months (no matter when the diagnosis was set). In the prevalence of diabetes, the prevalence of diabetes type 1 and type 2 are combined [4]. With the increasing prevalence of diabetes, there is also a rising need to manage and control the disease.

In 2011, the Slovenian Ministry of Health started the project of model practices in family medicine [5]. As the result, specialized registered nurses independently monitor patients with well-managed diabetes based on protocols [6]. Nurses' role is also to manage the register of diabetic patients and to monitor quality indicators [7]. Based on protocol, nurses search for unmanaged parameters [5], which could result in complications.

One of the common complications of diabetes is diabetic foot, which can result diabetes-related amputation [8]. The prevalence of major amputation (above the ankle) is one of the quality indicators of chronic care management [4]. In 2011, when the model practices project in family medicine started, the prevalence of major amputation due to diabetes complications was 370,1 per 100.000 patients, who have perscribed therapy for diabetes [3]. Preventive foot care is important for reducing the risk of diabetic-related amputation [9]. Therefore, the foot examination was added as part of the protocol for annual check-ups of diabetic patients by specialized registered nurses [10]. A special formular is used for the examination [11], and nurses provide education about foot care [10].

During the implementation phase of the project of model practices in family medicine, diabetologists exposed the problem of the high rate of major amputations related to diabetes. This paper was produced because the authors aimed to discover whether introducing routine foot examinations in diabetic patients has reduced the prevalence of amputations above the ankle.

II. Methods

A retrospective approach was used to analyse existing data obtained from publicly available register of the National Institute of Public Health of Slovenia [12, 13]. Data on amputations above the ankle as well as the data on yearly foot examination frequency in diabetic patients during the period 2015–2019 were analysed. This study proposed a connection between the increasing number of yearly foot examinations and the decreasing number of amputations among patients with diabetes.

Limitations

The limitation of this study are many biases due to the lack of important data (such as foot examination providers, types of diabetes, ect.). Therefore, the study has weak rigour and can provide just the assumptions, not the scientific evidence.

III. Results

Data on amputations above the ankle are a national quality indicator: "1.3.3 Annual incidence of amputation above the ankle in patients with diabetes" [12]. Figure 1 presents the number of cases of amputations of the lower limbs above the ankle (major amputation) in patients with diabetes per 100.000 patients with diabetes in the observed calendar years.

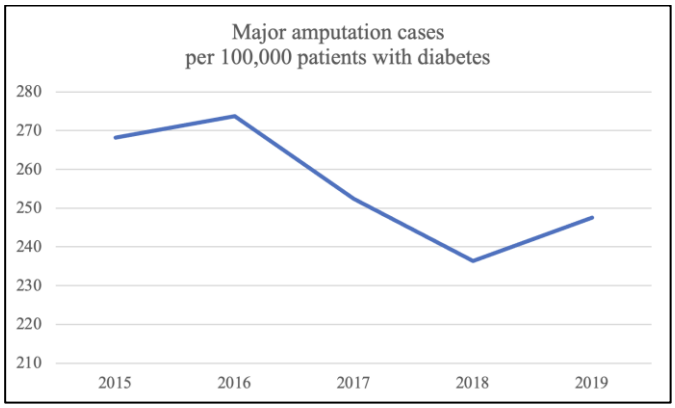

Figure 1: Amputation cases per 100.000 patients with diabetes in the period 2015–2019.

Statistical data on yearly foot examination prevalence are collected by the project office of the National Institute of Public Health [13]. Figure 2 presents the prevalence of yearly foot examinations by specialized registered nurses at family practices in the observed years.

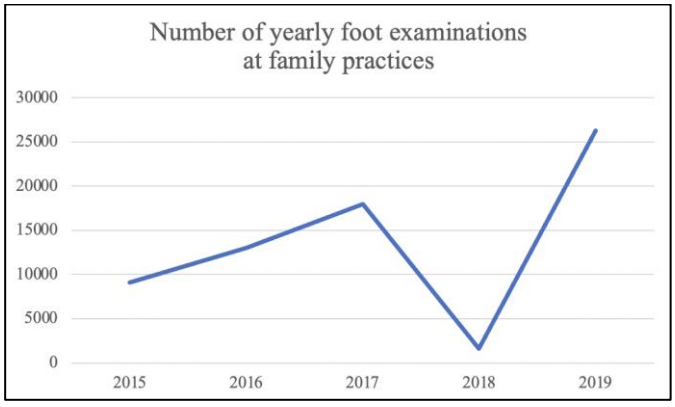

Figure 2: Number of yearly foot examinations by specialized registered nurses at family practices in the period 2015–2019.

IV. Discussion

According to the data from Figure 1 and Figure 2, we can assume that major amputations are decreasing since yearly foot exams are increasing. This assumption should not be considered as the scientific finding of this study since the correlational analysis was not made. Nevertheless, this assumption is supported by studies from abroad, where different authors [14, 15] exposed the benefits of foot examinations regarding preventing complications that could result in major amputation. It is necessary to acknowledge the importance of specialized registered nurses' work with diabetic patients since they provide most foot examinations [13].

Specialized registered nurses at family practices are important in major amputation prevention because they independently monitor well-managed patients with diabetes [5]. The same service is provided by specialized registered nurses at diabetic practice on secondary level of health care. Nurses' extended knowledge and expertise detect the first potential complications of diabetes. The specialized registered nurse then provides education about prevention and self-care of diabetic foot [11]. The patient is referred to a physician regarding the protocol if necessary.

It would be interesting to look at what happened in 2018, as there was a decrease in the number of foot examinations and an increase in the number of amputations. The same year, the American Diabetes Association published new dietary guidelines for diabetes [16]. After 2018, we are observing a slight incrrase, but afterwards a new decrease in amputation rate.

Most diabetes-related amputations can be prevented by appropriate lifestyle changes, blood sugar management, regular foot exams, and prompt wound care when needed [1]. A team-based approach at family practices improved the quality of chronic care management, enabled continuous monitoring of patients with diabetes, and patient-centered instructions. The opportunity for improving the approach of team-based diabetes management at the family practice is to optimize protocols, adjust the quality indicators, and implement improvements [7]. Educating and training healthcare workers of different profiles about diabetes management and preventing its complications can lead to better and more efficient patient outcomes [17].

By reducing complications like major amputation, patients' quality of life with diabetes is preserved [18]. Since diabetes is a lifelong disease, the actual effectiveness of the work of specialized registered nurses in reducing complications in chronic patients will be seen in the future.

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Experiences with Telemedicine and Digital Tools among Primary Health Care Level Physicians in Pomurje, Slovenia

Original Research

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Abstract— **Background: In the last decade, and especially in recent years, we have noticed a rapid development of information and communication technologies used in healthcare. In the reorganization of work due to the Covid-19 pandemic, we quickly accepted and started using telehealth and telemedicine services. Firstly, the plan for telehealth in the EU was adopted in 2004, since then the European Commission has been encouraging member states to adopt e-health more widely. The result of this is the e-Health project in Slovenia, the goal of which is computerization of Slovenian healthcare. To this date, we have obtained many useful information solutions through this project: E-prescription, e-referral, e-consultation, and the Central Register of Patient Data; however, information on physician perspectives about these visits are lacking.**

Methods: We performed a cross-sectional observational study of qualitative methodology. The online survey was sent to the e-mail addresses of all primary physicians in Pomurje according to previous valid list of The Health Insurance Institute of Slovenia (general or family physicians and paediatricians who work at the primary level). We used the validated TUQ questionnaire (Telehealth Usability Questionnaire) which we translated and adapted to our conditions. Specialists were asked to forward the survey to their residents who are not registered in the specialist's database.

Results: Out of 98 mails sent, we have received 104 completed surveys (specialists were instructed to forward the invitation mail to their residents), 77 (74.0%) females and 27 (26.0%) males. 81 (77.9%) were general or family medicine specialists or their residents, 21 (20.2%) paediatrics specialists and their residents, 2 (1.9%) were specialist of Occupational medicine. The mean age was 45.9±12.3 years with a length of service of 18.5±13.1 years. In general, satisfaction with the use of telemedicine and digital tools is high, which is observed among the younger and older physicians. They felt that the system was easy to use and that they could communicate with patients using face-to-face meeting. Those who were not satisfied with the use of telemedical approaches did not use it. They agreed that it was an unacceptable way of treating the patient as they did not trust digital tools and found the use too difficult.

Conclusions: Most of the research conducted so far regarding telemedicine treatment has focused on the experience and satisfaction of patients. They were largely satisfied with the use of any of the telemedicine modalities (videoconference, telephone call, asynchronous TM). Innovations and changes bring challenges, which is why they are mostly difficult to accept for all stakeholders. Primary level physicians in Pomurje are mostly in favour of its use. However, it should be emphasized that telemedicine will not completely replace traditional examinations in the outpatient clinic, but rather complement them. We should embrace the best of both worlds – humanism in medicine and the use of new technologies to improve health care. It is also necessary to take care of adequate technological support, additional education and appropriate training of health workers, the creation of unified protocols and treatment standards, and a solution to the problem of personal data protection.

Index Terms-- **experience, primary health care, physicians, telemedicine, telehealth, Slovenia**

I. Introduction

WHO's definition of telehealth is the delivery of health care services, where distance is a critical factor, by all health care professionals using information and communication technologies, for the exchange of valid information for diagnosis, treatment, and prevention of disease and injuries, research and evaluation, and also for the continuing education of health care providers, in all the interests of advancing the health of individuals and their communities. (1) Telemedicine can be defined as the provision of health services using information and telecommunication technologies where one or more health service providers and the patient are spatially separated. (2, 3)

Telehealth as a professional term has been used since 1990s. Telemedicine applications have increased rapidly in many parts of the world during the last decades. Telemonitoring of chronically ill patients was already introduced in Sweden in 2000 and they computerized clinical decision support systems to aid telephone triage. In 2010, they evaluated video consultations between patients and doctors in rural areas. (1,4)

The first plan for telehealth in the EU was adopted in 2004, since then the European Commission has been encouraging member states to adopt e-health more widely in Europe. As a result, the e-Health project was established in Slovenia and the main aim was the computerization of Slovenian healthcare. Nowadays, we have obtained many useful information solutions through the project: e-prescription, e-referral, e-consultation, and the Central Register of Patient (CRPP). (2,5)

Telemedicine services used in primary healthcare in Slovenia can be classified into three main categories, which are combined to achieve the best possible clinical effect. The first is storage and forwarding; the doctor can obtain the data and results of examinations from information systems (CRPP) or the patient can provide them to him, e.g. using e-mail or directly from other health service providers with whom it communicates and coordinates data (e-Consultation).

The second category is telemonitoring. The measurements are made with tested and calibrated devices, analysing the patient's physiological parameters in the home environment. For example, one can monitor the management of chronic diseases - arterial hypertension and diabetes mellitus type 2. The last category is a form of communication, whether synchronous (video or phone call) or asynchronous (e-mail). (2,6,7)

It was possible to use telemedicine approaches in practice long before the COVID-19 pandemic, but they were not used to such an extent by healthcare providers at the primary level. (8) The outbreak of the COVID-19 pandemic in 2020, which resulted in social distancing due to an attempt to limit the spread of the virus, greatly accelerated the digitization of healthcare and the adoption of regulations for the use of telemedicine. (4,8) In the recent period, the rapid development of artificial intelligence in primary care and its related clinical applications has been causing a lot of concerns. (4)

Most of the research conducted so far regarding telemedicine treatment has focused on patient perspectives about telemedicine visits. Currently, we are less aware how satisfied and experienced physicians are with this type of patient care. (8) The results show that patient acceptance of telemedicine is generally high. Physician attitudes and experiences have been varied. (4)

In a study conducted in Saudi Arabia, 77% of participating physicians were satisfied with the experience of virtual visits. Telephone calls were used as the main communication tools - 98% of the respondents, with a comfort level of 78%, and 77% of the participants also used video consultations; however, only 38% felt comfortable during the consultation with the patient.

Further problems while using virtual tools were concerns that patients overuse the service, 72% were concerned about patients' limited technical knowledge, and 70% claimed that patients had limited access to the necessary technology. Respondents who successfully included virtual consultations in their workflow expressed a higher level of satisfaction. (9)

In a study carried out at the University of Pittsburgh Medical Center, it was found that 65% of doctors agree that telemedicine services do not affect their relationship with the patient; more than half of them were satisfied with the use of virtual consultations and agreed that they save time. Doctors and patients agreed that they do not waste so much time driving to medical facilities, this way being more sustainable. Only 29% of them thought that they could perform a sufficiently good clinical examination. The final results show that the majority of respondents confirmed their satisfaction with mandatory virtual education before the COVID-19 epidemic and that the prior use of the patient's electronic medical record had a positive effect on the rapid adoption of the use of telemedicine. (10) On the other hand, the results of the Swedish and American (UCLA) studies do not coincide with the claims above. Doctors involved are in favour of telemedicine, which focuses on clinical usefulness. They see the loss of personal contact with patients as an issue, and the technological infrastructure has not been updated for such needs at the primary level of health care. Consequently, they also expressed worries that these factors will result in harm to the patient and will only further increase the workload. (4) In the American study, the results are comparable, but they see the problem that certain vulnerable groups of patients have neither the knowledge nor the necessary technology for this type of care. They stated that the positive outcome of using video calls is that they can see the patient's environment and the conditions they live in. This way, they can see potential safety hazards and home support systems. (8)

During the pandemic, community health centers (CHCs) in New York State conducted a study on providers' perceptions of telehealth. Findings suggested that most clinicians agreed that telemedicine has improved patients' access to medical care and resulted in fewer patient no-shows. (11)

The present research examines primary health care level physicians and their experience with telemedicine and digital tools, as physician acceptance remains vital to telehealth gaining wider and more permanent adoption. Additionally, the acceptance of the use of new technologies in medical treatment requires the satisfaction of both doctors and patients. (12,13)

A lot of research has already been done in Slovenia on the topic of telehealth and telemedicine. Additionally, our study is the first to get an insight into the experiences of doctors at the primary level of healthcare in the Pomurje region with the use of telemedicine. Pomurje is located in the northeastern part of

Slovenia. Its urban center is Murska Sobota, the area is mostly rural. In 2021, this statistical region had the highest average age of residents, which is 2.3 years higher than the Slovenian average statistic. The educational structure of the population is less favourable, mainly at the expense of brain drain. Socio-economic indicators point to the poor economic development, which lags behind the Slovenian average, and even more so for the central Slovenian region, which is the most developed in Slovenia. (14)

II. Material and Methods

Survey instrument

We used a validated TUQ questionnaire (Telehealth Usability Questionnaire) (15) on telemedicine use, satisfaction, experiences and future use, which we translated and adapted to our conditions. A 21-item 7-point Linkert scale was used with responses ranging from strongly disagree to strongly agree. The questionnaire was use for medical physicians who work on primary health care level in Pomurje, ranging from the early months of Covid-19 pandemic until the present time (from February 2020 until March 2023).

Data Collection and statistical analysis

We performed a cross-sectional observational study of qualitative methodology. The online survey was sent to the e-mail addresses of all primary physicians in Pomurje according to the then valid list of The Health Insurance Institute of Slovenia (general or family physicians and paediatricians who work at the primary level). Specialist physicians were asked to forward the survey to their residents who are not registered in the specialist's database.

The results of categorical variables were presented in the form of frequencies with the corresponding percentages, and for numerical variables in the form of mean values with standard deviations. The usefulness of telemedicine was measured using a seven-point Likert scale, all statements were defined as numerical variables. A comparison of the utility of telemedicine between family medicine physicians and paediatricians was made using the t-test for independent samples because the pairwise analysis included a numerical and a categorical variable with two categories. The usefulness of telemedicine in relation to the number of identified patients was analysed with the Pearson correlation coefficient (all variables included in the analysis were pairs of numerical type). Statistical analysis was performed using IBM SPSS for Microsoft Windows, version 28 (IBM Corp., Armonk, NY). A value of $p<0.05$ defined the limit of statistical significance.

III. Results

Sample demographics

Out of 98 e-mails sent, we received 104 completed surveys (specialists were instructed to forward the invitation mail to their residents), 77 (74.0%) females and 27 (26.0%) males. 81 (77.9%) were general or family medicine specialists or their residents, 21 (20.2%) paediatric specialists and their residents, 2 (1.9%) were specialist of Occupational medicine. The mean age was 45.9±12.3 years with a mean length of service of 18.5±13.1 years.

Table 1: Demographics of Responders

	N	%
Professional roles		
Physicians	90	86,5
Residents	14	13,5
Speciality		
Family medicine specialists	81	77,9
Paediatricians in primary care	21	20,2
Occupational medicine specialists	2	1,9
Sex		
Female	77	74,0
Male	27	26,0
Total number of responders	104	100

Survey results

Before Covid-19 pandemic there were 36 (34,3%) physicians that were using telemedical approaches, during Covid-19 pandemic there were 92 (88,5%) physicians, and after Covid-19 pandemic 87 (83,7%) physicians continued using telemedical approaches.

All of them used or are still using phone calls for communicating with their patients, 5 (4.8%) physicians decided for video calls, 61 (58,7%) physicians communicated with their patients using emails, 17 (16,3%) physicians chose an electronic health record system, 10 (9.6%) physicians used various applications that work in conjunction with patients' smartphones and 3 (2.7%) physicians decided for various medical portals for communication (do.zdravnika, Gospodar zdravja).

Figure 1: Proportion of physicians using telemedical approaches before, during and after Covid-19 pandemic.

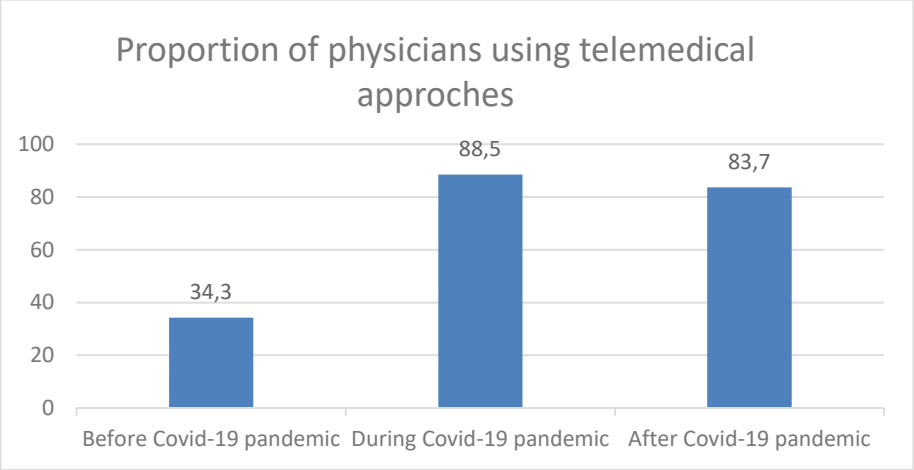

Figure 2: Proportions of utilization of different kinds of technical modalities in telemedicine.

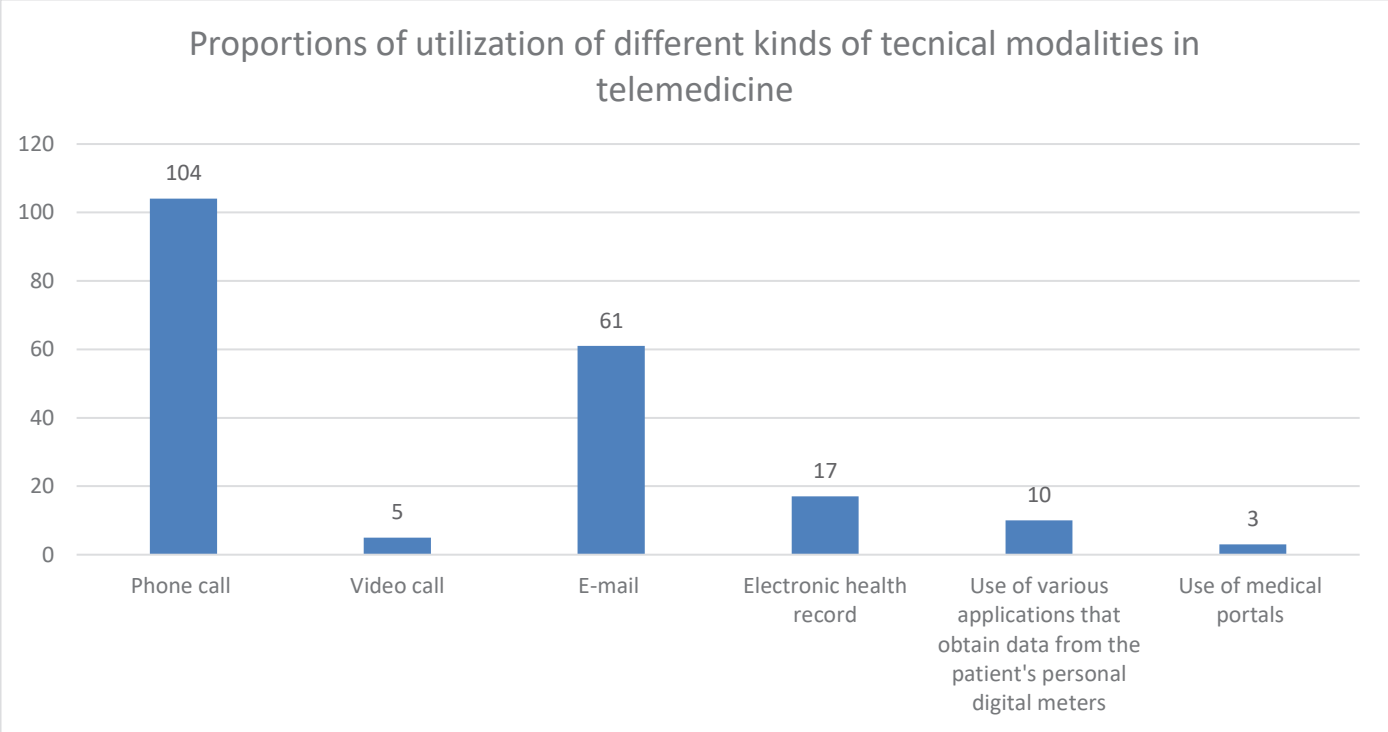

Table 2: Summary Results of 21-item Survey showing Experience with Telemedicine.

	All responders (N=104)		Family medicine, Occupational medicine specialists (N=83)		Paediatricians (N=21)			
	MV	SD	MV	SD	MV	SD	t	p-value
Telehealth improves my patients' access to healthcare services needed.	5,5	1,4	5,5	1,4	5,3	1,4	0,571	0,570
Telehealth saves my patients' time traveling to a hospital or specialist clinic.	5,4	1,5	5,4	1,6	5,3	1,3	0,076	0,940
Telehealth provides for my patients' healthcare need.	5,1	1,5	5,2	1,4	4,7	1,6	1,616	0,109
It was simple to use this system.	4,9	1,8	5,0	1,8	4,5	2,0	1,281	0,203
It was easy to learn to use the system.	5,5	1,6	5,7	1,6	5,0	1,9	1,543	0,126
I believe I could become productive quickly using this system.	5,1	1,9	5,2	1,9	4,6	2,1	1,337	0,184
The way I interact with this system is pleasant.	4,9	1,6	5,1	1,6	4,1	1,6	2,619	0,010
I like using the system.	4,7	1,9	4,9	1,8	3,9	1,9	2,239	0,027
The system is simple and easy to understand.	4,9	1,6	4,9	1,6	4,8	1,5	0,270	0,788
This system is able to do everything I would want it to be able to do.	3,6	1,7	3,7	1,7	3,2	1,4	1,162	0,248
I can easily talk to the patients using the telehealth system.	4,6	1,8	4,8	1,7	4,1	2,1	1,425	0,157
I can hear the patients clearly using the telehealth system.	4,4	1,6	4,6	1,6	4,0	1,8	1,564	0,121
I felt like patients were able to express myself effectively.	4,1	1,7	4,2	1,7	3,8	1,8	1,011	0,314
Using the telehealth system, I can treat patients as well as if we met in person.	3,6	1,8	3,7	1,8	3,3	1,9	0,862	0,391
I think the visits provided over the telehealth system are the same as in-person visits.	3,3	1,9	3,3	1,9	3,4	1,7	0,251	0,802
Whenever I made a mistake using the system, I could recover easily and quickly.	4,6	1,8	4,7	1,7	4,1	1,8	1,434	0,155
The system gave error messages that clearly told me how to fix problems.	3,5	1,7	3,6	1,7	2,9	1,5	1,881	0,063
I feel comfortable communicating with the patients using the telehealth system.	3,2	1,8	3,3	1,8	3,1	1,7	0,250	0,803
Telehealth is an acceptable way to treat my patients.	4,0	1,9	4,0	2,0	4,1	1,9	0,124	0,902
I would use telehealth services again.	4.8	1,9	5,0	1,9	4,4	2,0	1,236	0,219
Overall, I am satisfied with this telehealth system.	4,7	2,0	4,8	1,9	4,1	2,1	1,422	0,158
MV - Mean value of 7-point Linkert scale; SD - Standard deviation, t – t-test for independent samples, p-value - statistically significant difference								

In general, satisfaction with the use of telemedicine and digital tools is enormous. They agree the most by stating that "Telehealth improves my patients' access to healthcare services needed" and "It was easy to learn to use the system". They felt that "the system was easy to use" and that they could communicate with patients using face-to-face meetings. They disagreed the most in the following statements: "I feel comfortable communicating with the patients using the telehealth system" and "I think the visits provided over the telehealth system are the same as in-person visits". Those who were not satisfied with the use of telemedical approaches did not use it, mostly because they did not think it was an acceptable way of treating the patient as they did not trust digital tools and found their use too difficult.

There was a statistically significant difference between family medicine and occupational medicine specialists and paediatricians in statements: "The way I interact with this system is pleasant" and "I like using the system", whereas family medicine and occupational medicine specialists expressed statistically significantly greater agreement than paediatricians.

Table 3: Correlations between the number of patients and statements.

	r	p-value
Telehealth improves my patients' access to healthcare services needed.	0,003	0,975
Telehealth saves my patients' time traveling to a hospital or specialist clinic.	0,095	0,340
Telehealth provides for my patients' healthcare need.	0,084	0,394
It was simple to use this system.	-0,031	0,754
It was easy to learn to use the system.	-0,014	0,888
I believe I could become productive quickly using this system.	-0,063	0,523
The way I interact with this system is pleasant.	-0,015	0,877
I like using the system.	0,031	0,752
The system is simple and easy to understand.	0,068	0,492
This system is able to do everything I would want it to be able to do.	0,293	0,003
I can easily talk to the patients using the telehealth system.	0,106	0,283
I can hear the patients clearly using the telehealth system.	0,113	0,253
I felt like patients were able to express myself effectively.	0,214	0,029
Using the telehealth system, I can treat patients as well as if we met in person.	0,294	0,002
I think the visits provided over the telehealth system are the same as in-person visits.	0,264	0,007
Whenever I made a mistake using the system, I could recover easily and quickly.	0,087	0,378
The system gave error messages that clearly told me how to fix problems.	0,152	0,124
I feel comfortable communicating with the patients using the telehealth system.	0,244	0,013
Telehealth is an acceptable way to treat my patients.	0,229	0,020
I would use telehealth services again.	0,085	0,392
Overall, I am satisfied with this telehealth system.	0,120	0,227
r - Pearson's correlation coefficient, p-value - statistically significant difference		

All five positive weak correlations (r<0.3) were shown, as physicians with a larger number of patients expressed a statistically significant higher degree of agreement with the next statements: “This system is able to do everything I would want it to be able to do”, “Using the telehealth system, I can treat patients as well as if we met in person”, “I think the visits provided over the telehealth system are the same as in-person visits”, “I feel comfortable communicating with the patients using the telehealth system” and “Telehealth is an acceptable way to treat my patients”.

IV. Discussion

In primary care clinics, telemedicine services are readily available and have been used for a long time. The extent to which they are used depends mainly on the doctor and his decision for this type of communication. In this study, we analysed the experience of doctors at the primary health care level in Pomurje region in this field. Furthermore, with the collected data, we tried to emphasize which technical modalities in telemedicine still have a lot of potential for improvement in the future.

During the pandemic, prevention of the spread of SARS-COV-2 infection was the main facilitator of the rapid adoption and use of telecommunication and information technologies in all primary care clinics. Only 34% of respondents used these services before the declaration of the pandemic which is confirmed by the fact that telemedicine approaches had already been used by 88.5% of participants during the pandemic. This percentage remained almost unchanged even after the end of the pandemic (83.7%), which indicates the satisfaction of the majority of stakeholders with these services. Similar results were projected in a survey in the USA, where in 2016 only 11.8% of family doctors and pediatricians used telemedicine, but after two months of the pandemic in 2020, this proportion increased to 91%. (16)

All participants in our study (100%) used telephone calls to communicate with patients. These findings support the results of a study carried out in Saudi Arabia that the telephone call is the most frequently used and thus the primary telemedicine modality in outpatient clinics, which also increases access to health services in the future. A major difference is in the use of video calls, as 77% of respondents use them, and in Pomurje region, the usage is less than 5%. Therefore, we prefer greater privacy and ease of use offered by a telephone call instead of the advantages offered by a video call. The following factors are: improved patient engagement, the ability to use visual perceptions for clinical examination needs, understanding non-verbal communication and a more comprehensive insight into the patient's life, including social support, hygiene, and medication adherence. (11)

As a result, the video call brings a new meaning to traditional house visit. (8) The legislation in the field of personal data protection in Slovenia prohibits us from providing patients with medical information, diagnoses, and advice on the treatment of medical conditions using an e-mail which is only for ordering. From this point of view, it is interesting that 58.7% of participants communicate with their patients via e-mail, while less than 3% of doctors use online medical portals, which represent a solution to legal restrictions regarding the protection of personal data. These portals are Gospodar zdravja and doZdravnika, which enable medical institutions and patients to send all types of documents securely electronically, i.e. manage all administration and securely conduct video consultations with a family physician. (17,18). In the Arabic study, only 2% of doctors used email for communication. (9) A Swedish study from 2019 analysed the experience of using an e-consultation platform. Patients with psychological problems and those who often need a doctor's advice gained a lot, as they could write a message about their problems outside of working hours. They observed a reduction in anxiety and thus a reduction in the need for the number of follow-up examinations. However, with the introduction of the platform, the amount of work has increased, thereby reducing overall efficiency. (19)

In our study, the participants agreed that telehealth improves patients' access to healthcare services and the system was easy to use. The participants disagreed the most in the following statements: “I feel comfortable communicating with the patients using the telehealth system” and “I think the visits provided over the telehealth system are the same as in-person visits. Similar results were described in the Pittsburgh study, where the participants were of the opinion that telemedicine improves access to health care and that working with the system is simple and they learned it quickly. The majority were satisfied with the compulsory, as well as voluntary education through video content. Only 22% of participating primary care specialists were of the opinion that video visits are as good as a regular in-person visit. Differing from our study, they were satisfied with communication with patients via the medical platform, and even more 65% of them believed that the provider-patient relationship is unimpaired. (10)

There was a statistically significant difference between family medicine and occupational medicine specialists and pediatricians in the following statements: “The way I interact with this system is pleasant” and “I like using the system”, where Family medicine and occupational medicine specialists expressed statistically significantly greater agreement than pediatricians. Less satisfaction with the use of telemedicine services among pediatricians probably originates from the fact that they also often use telephone calls in Pomurje, where, compared to a traditional visit to the outpatient clinic, the visual and tactile aspects are missing. In this case, doctors only have to decide on further action based on the obtained history. Consequently, it is challenging to fully rely on a history obtained by a child or a concerned parent. This also helped raise the awareness that children compensate for health problems very well and for a long time, and at the same time, we can get the false feeling that they are still in good health. The decompensation is drastically fast. A review of the literature on this topic suggests that telemedicine services are comparable to face-to-face services (in the general population

and in the children treatment). Moreover, clear consensus on the benefits of telemedicine approaches in pediatrics has not been reached. The management of chronic health conditions with telemedicine approaches has so far shown a lot of satisfaction and prospects for the future, especially when combined with personal visits. (20)

During the study, we compared satisfaction or the degree of agreement with the statements between doctors working in clinics with a higher and those with a lower number of identified patients. Statements that showed a statistically significant higher level of agreement among doctors with a larger number of patients are: "This system is able to do everything I would want it to be able to do", "Using the telehealth system, I can treat patients as well as if we met in person", "I think the visits provided over the telehealth system are the same as in-person visits", "I feel comfortable communicating with the patients using the telehealth system" and "Telehealth is an acceptable way to treat my patients".

None of the existing studies have attempted to compare this correlation so far. The results confirm the findings from the American study that telemedicine visits are shorter on average than in-person visits. (8) In clinics with more identified patients, time management is much more important than in smaller clinics. At the same time, they must treat and take care of a larger number of patients, so they are forced to solve simple problems, such as extending prescriptions, control referrals and other administrative services in the shortest time possible. Furthermore, they can ensure that other patients with more complex problems have fast enough access to a doctor and quality treatment.

Strengths and limitations

This was the first study conducted in Pomurje region on experiences with telemedicine and digital tools among primary care physicians. One of the crucial elements during our study was the large response of the participants and the use of a validated questionnaire. However, the results of this study cannot be generalized for all primary care physicians in Slovenia because of specific socioeconomic and age characteristics of Pomurje region. Another interesting point would be the number of distance visits made by each individual and whether they had any training on this topic, and to include doctors at the secondary level in the research. This way, we would get a complete picture of the current experience with telemedicine among doctors in Pomurje region.

V. CONCLUSION

The majority of doctors at the primary level in Pomurje have some experience with telemedicine, most of them are agree that digital tools increase the accessibility of health services, are easy to learn to use, and save patients' time spent traveling to institutions. Most of them have a positive view of telemedicine; even after the end of the pandemic and the lifting of restrictive measures, many digital tools remain present in the daily routine of respondents, especially doctors with a larger number of patients are satisfied with this method of treatment. For these methods, the doctors must know their patient well in his biopsychosocial environment and master the skills of other types of communication as well as understand and accept the limitations of these methods of treatment. Given these assumptions, telemedicine has a great potential to improve access to health services - including subspecialty ones - for all doctors and patients, regardless of where they live. This is only possible by analysing the existing situation and constant improvements.

Funding Statement

This research received no external funding.

Conflicts of interest

The authors declare that no conflicts of interest exist.

Ethical approval

The research carried no risk of violating ethical principles.

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Patient Portal and Central Registry of Patient Data: leading accelerators of healthcare digitalisation in Slovenia

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Abstract— **Slovenia is one of the most digitally advanced nations in Europe when it comes to healthcare. The previous years have seen a significant progress in the development and use of the eHealth applications, particularly during the COVID-19 pandemic. The zVEM Patient Portal and the Central Registry of Patient Data have made the most notable advancements. This paper presents an in-depth analysis of the functionalities and use of the zVEM Patient Portal and the Central Registry of Patient Data, and additionally investigates how the COVID-19 epidemic has affected the development and use of these two eHealth solutions. The zVEM Patient Portal provides users with secure and reliable access to eHealth services and personal health data, which is retrieved from the Central Registry of Patient Data. The data on use of the zVEM Patient Portal and the Central Registry of Patient Data shows a big jump in 2020 and further exponential growth in 2021. Increased use continues in 2022.**

Index Terms-- **zVEM Patient Portal, Central Registry of Patient Data, eHealth, digitalisation, healthcare informatics**

I. Introduction

eHealth is the cornerstone of the healthcare digitalisation initiatives in Slovenia. Slovenia is one of the most digitally advanced nations in Europe when it comes to healthcare [1]. The previous years have seen significant progress in the development and use of the eHealth applications, particularly during the COVID-19 pandemic. The zVEM Patient Portal (zVEM) and the Central Registry of Patient Data (CRPD) have made the most notable advancements.

The effective and comprehensive digital transformation of the Slovenian healthcare system is one of the fundamental changes that should contribute to greater success in dealing with the numerous challenges facing Slovenia's healthcare sector. The experiences of developed countries [2,3,4] indicate that successfully implemented projects of digitalising healthcare have exceptional strategic importance for the further development of the healthcare system, and they also point to broader implications centred around increased social well-being and economic growth [5].

eHealth, which has been led by the National Institute of Public Health (NIPH) since 2015, is one of the key long-term goals of the public sector in Slovenia. Despite certain challenges, great progress has been made in the field of eHealth solutions in the last years. The COVID-19 epidemic has in many ways marked the development of the entire healthcare informatics in Slovenia. The paper presents an in-depth analysis of the functionality and use of the zVEM web portal and the CRPD in the last years, especially during the COVID-19 epidemic. Today, this is without a doubt the most complex public information system in Slovenia. The use of the zVEM and the CRPD has been growing exponentially in the last two years. Although eHealth solutions have undergone unprecedented development in recent years, much effort will have to be made by all stakeholders in the future and additional human and material resources will have to be provided, if we want to maintain progress and perhaps even accelerate the development trend in healthcare informatics in Slovenia.

II. Material and Methods

This paper presents an in-depth analysis of the functionalities and use of the zVEM and the CRPD, and additionally investigates how the COVID-19 epidemic has affected the development and use of the zVEM and the CRPD solutions. This is an extreme example of the development process in the field of eHealth solutions in Slovenia, which was highly accelerated during the COVID-19 period, suggesting that the pandemic was a particular opportunity for rapid advancement in the digitalisation domain. The in-depth analysis presented in this paper was based on the case study research methodology [6,7], which included an in-depth study of the field and its critical analysis.

This article presents an analysis of the functionalities and use of the zVEM and the CRPD in recent years, especially during the COVID-19 pandemic. The analysis performed in this work was based on the case study research methodology and was

conducted in the first half of 2023. On one hand, the analysis included a comprehensive literature review in the field, and examination of project documentation and technical specifications for the zVEM and the CRPD. On the other hand, it was based on the observations, experience, and professional opinions of experts at the NIJZ who are managing the eHealth system (including the zVEM and the CRPD), along with the actual statistical data on the use of the zVEM and the CRPD from the administrative and business intelligence modules.
This paper focuses on the zVEM and CRPD principally because of their usability and importance both for patients and for healthcare workers, and also because of the major progress in the last years. The synthesis of findings from the literature, user functionalities from the technical documents, statistical reports and the views of the NIJZ experts, enable the formulation of credible conclusions based on verifiable data regarding the highlighted research aims.

III. Results

zVEM Patient Portal

The greatest development in terms of the digitalisation of healthcare in Slovenia in the last years has been observed in the zVEM system [8,9]. The zVEM was designed as a linking service and the central hub of primary eHealth solutions for patients, for enabling secure and efficient access to their referrals, prescriptions, specialist reports and other documents, and online booking of appointments to secondary services and reviewing waiting periods [10]. From the patient's point of view, the development and establishment of the zVEM is certainly one of the major gains in recent decades. Technically, the system was set up in the conclusion of the eHealth project in November 2015, while its full use, with the possibility of registration, was ensured at the beginning of 2017 [11,9]. The zVEM provides users with secure and reliable access to their data in the eHealth databases and access to eHealth services. It also offers users current content in the area of public health [12]. The zVEM was put into successful use at the beginning of 2017, and its use experienced a major step forward in 2020 and again in 2021, with the possibility of printing out the COVID-19 test results and vaccination status, along with the European Digital COVID Certificate. The first digital vaccination certificate could be printed out on 19 March 2021, while the EU Digital COVID Certificate (EU DCC) could be printed from 24 June 2021. Since 13 July 2021 the zVEM application has also been available to mobile phone users, and users have been able to download the application for verifying the EU DCC since 5 August 2021 [9].

Healthcare providers send out specialist reports, discharge letters and data for the Patient Summary. The databases contained within the eHealth system are used to complete data on prescriptions (eRecept), referrals and appointments (eNaročanje) and vaccinations (eRCO). Insurance data is transferred from the national Health Insurance Institute (ZZZS) files. Demographic data is transferred from the Register of Patients and Spatial Units (RPPE), which is regularly updated from the Central Population Register (CRP) and the national Survey and Mapping Administration. Patients themselves can also express their consent, and can make vaccination bookings (Fig. 1).

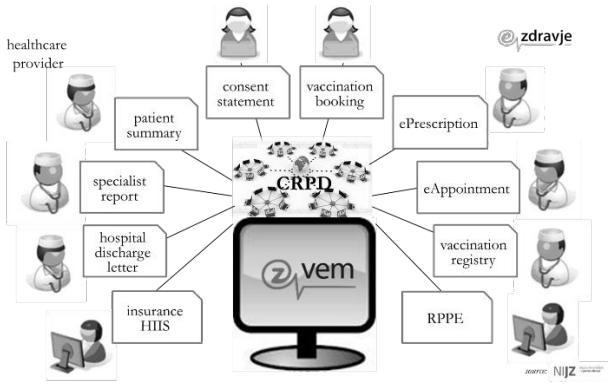

Figure 1. Display of data on the zVEM.

In 2021, the number of registered users of the zVEM increased more than ninefold, reaching 409,900 at the end of 2021. In 2022, the number of registered users is still growing, but at a much slower pace (Fig. 2).

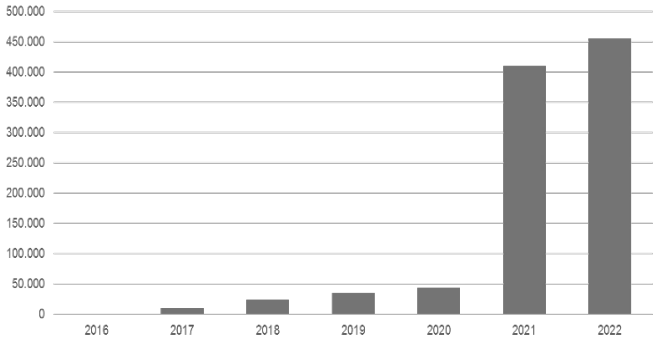

Figure 2. Growth in the number of registered users of the zVEM by year.

The number of unique visits to the zVEM portal also increased exponentially in 2021, reaching 23,975,212 at the end of the year, almost 13 times the number in 2020. The exponential growth is mainly due to the introduction of certificates of testing and certificates of vaccination against COVID-19, and in particular the possibility to print out the EU DCP in July 2021. The high number of visits in 2022 is also recorded in comparison to 2020, although it is down by a third compared to 2021 (Fig. 3).

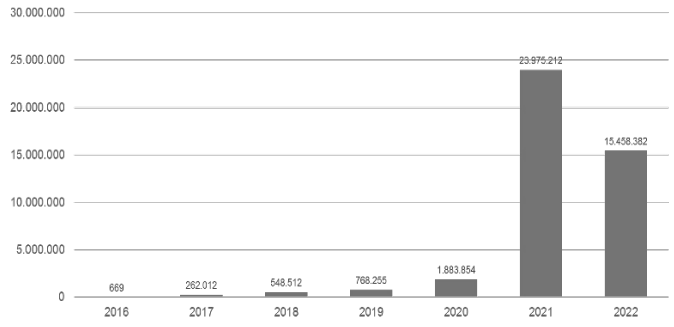

Figure 3: Growth in the number of visits to the zVEM by year

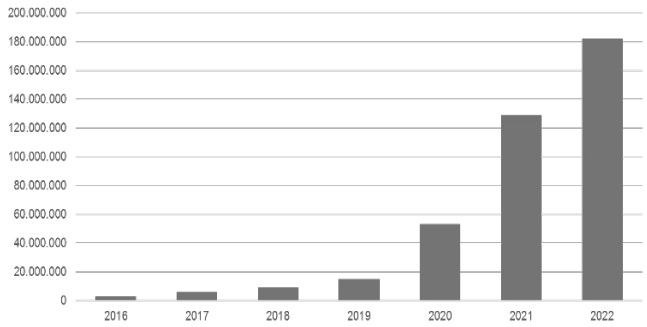

Figure 4. Growth in the number of documents in the CRPD by year.

zVEM plus (zVEM for healthcare providers)

The zVEM plus portal includes various applications, connected to the Slovenian CRPD, which enable the capture of data and its processing, and the issuing of various reports for healthcare providers. It is intended for providers that do not use their own information system for this, such as retirement homes, mobile testing points etc. Some of the most widely used applications of zVEM plus include the OKZ app for the issuing of the Personal medication card and the COVID-19 test app for efficient entry of COVID-tests into the database. In the future, the system will be upgraded to a more fully-fledged appointment management and communication system, through which patients will be able to get appointments, ask for prescriptions and communicate with their health-care providers. The investment was financed by the European Union from the European Regional Development Fund as part of the EU-wide response to the COVID-19 pandemic [10].

The Central Registry of Patient Data – CRPD

The data displayed via the zVEM is drawn from the CRPD. Today, the CRPD contains a database on patients with permanent or temporary residence in the Republic of Slovenia and is the most complex public information system in the country.

Sending data to the CRPD is obligatory under the Health Care Databases Act (ZZPPZ) [13], and thus all healthcare providers are required to use this system. Data is also submitted by concession holders and private operators without a concession. Data processing in the CRPD, access to data, exchange of data for providing medical care and autopsy services, and updating health documentation is regulated by this Act as well [9].

The data on the number of documents in the CRPD shows a big jump in 2020 and further exponential growth in 2021. At the end of 2021, the number of documents in the CRPD has reached 129,010,388. The rapid growth continued in 2022, when the number of documents exceeded 182,000,000 (Fig. 4).

IV. DISCUSSION

The zVEM surely delivers significant benefits to all stakeholders in the Slovenian healthcare system. In addition to the basic benefits of access to eHealth solutions and medical documentation already mentioned, the zVEM is a vital instrument for patient empowerment and directing public health initiatives and communication with the public, especially during the critical times (the COVID-19 crisis). From the patient's point of view, the development and establishment of the zVEM is certainly one of the major gains in recent decades. During the epidemic, the zVEM took on an important role in informing and raising public awareness.

The zVEM and the CRPD are constantly being developed and upgraded, and while this increases their wider usability, it also inevitably increases their complexity. In the time of the epidemic all the upgrades needed to be developed and implemented in the shortest possible time. For some solutions we could use already existing ideas with adjustments, while some needed to be done from the scratch. These developments would not have been possible without previous work on introducing, maintaining and developing the core services of the zVEM, the CRPD, and other eHealth solutions.

All this placed great pressure on the insufficient number of staff in the area of eHealth. This seriously impacts the eHealth budget, since upgrading and developing new services requires both initial investment costs and long-term costs for maintenance and for recruiting new staff members who will ensure the operation of these systems. The COVID-19 epidemic clearly illustrated the importance of the eHealth system for the Slovenian healthcare sector, since it can be asserted without doubt that without the eHealth system individual segments of the healthcare service in Slovenia would have collapsed, and a major portion of the system would be seriously crippled and limited in its operations. The greatest harm in such a situation would be suffered by patients.

The research results revealed that the COVID-19 epidemic had a major impact on the development and use of the zVEM and the CRPD solutions. During the epidemic, use of the eHealth system grew in leaps and bounds, and in some areas increased more than tenfold. Due to the growing requirements of users and needs of the system (patient needs, public health

needs, the needs of healthcare providers, the needs of healthcare policy), numerous existing features were upgraded, and many new functionalities were developed.

V. CONCLUSIONS

In recent years, Slovenia's eHealth system has undergone significant development, which was accelerated by the COVID-19 pandemic. The use of some eHealth applications has increased more than tenfold.

This in turn has brought up difficulties that have arisen to a large extent due to the inadequate investment in digitalisation, both in terms of HR and infrastructure, and also with regard to developing existing and new systems. There is relatively low level of awareness of the benefits of eHealth, which has been gradually improving, unfortunately, mainly due to the COVID-19 pandemic. The system was also very much exposed to the poor digital literacy of users, including the most basic use of computer and telecommunications equipment, as well as computer and information literacy and the use of software systems themselves. The digital culture in healthcare institutions needs to be raised, along with the digital competence of all employees. Digital culture is also important for the close cohesion of informatics and other areas of work in organisations, eliminating the traditional divergence. Here, the digital competence of all employees is very important.

The research also implies that the enormous progress that has been made in healthcare informatics over the past few years can only be maintained in the future with the successful promotion of eHealth and significant additional resources. Major efforts will be needed, as well as funds, to maintain and continue the truly huge progress made in healthcare informatics in recent years.

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How cultural and demographic characteristics influence the use of primary care services in village area in North Macedonia

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Abstract

Background: Individual values, beliefs, and behaviors about health and well-being are shaped by various factors such as race, ethnicity, nationality, language, gender, socioeconomic status, physical and mental ability, sexual orientation and occupation. Understanding the culture, demographic characteristics, religion and providing health care services that are acceptable to Albanian community have particular challenge. Aim of the study is to describe the cultural, ethnical and demographic characteristics of the Albanian ethnic population and their access to health care in a general practice in a village near Skopje. Method: Descriptive study based on the data from the electronic health register and the manually recorded data in the patients' paper health records of registered patientsin the maternal outpatient clinic aged ≥ 0 months. Results: 4137 patients from Albanian ethnicity registered in the GPs practice from all ages. Two specialists of family medicine from Macedonian ethnicity and 3 medical nurses from Albanian ethnicity work in the medical teams. Communication with patients is mostly carried out in the Albanian language. The birth rate is higher than the Macedonian population. In the past 5 years there is increased emigration of young families in the EU countries. Rate of childhood immunization is very high (94%), but the rate of screening programs for chronic diseases is not at a satisfactory level (43.3%). Gynecological visits are regular, but use of contraceptives (0.5%) is on low rate with small number of abortions. Among the population there is a very high percentage of smokers (42%) with approximately 3/4 male smokers over 10 years of age. Patients expect immediate health care for any acute condition (regardless of the level of urgency), while they often postpone preventive and control examinations for chronic diseases. Adherence to the prescribed therapy is at a high level, with the exception of the month of Ramadan and 1 month after when, due to fasting, some patients completely stop the therapy. An exceptional problem is observed in childhood with iron deficiency anemia (27.4%) and poor dental health (87%) due the bad eating habits. Conclusion: Cultural, demographic and ethnical characteristics are important determinants of population health outcomes and need to be recognized by health systems. At the same time, they essentially influence the shaping of the behavior of individuals towards their own health and the health of the family, outside of the framework of the health system. The goal of culturally competent health care services is to provide the highest quality of care to every patient, regardless of cultural or ethnic background.

***Index Terms*—cultural characteristics, ethnicity, islamic patients, primary care services**

I. INTRODUCTION

In primary care settings, cultural perception and competence attitude are imperative as notion of health, illness, sickness, and care means different to different people [1]. Individual values, beliefs, and behaviors about health and well-being are shaped by various factors such as race, ethnicity, nationality, language, gender, socioeconomic status, physical and mental ability, sexual orientation and occupation. The knowledge of cultural and ethnical characteristics facilitate healthcare providers to afford improved care and helps to avert misunderstandings among care provider's staff, patients and their families. However, similar to ethnicity and culture, religion can be an important determinant of health outcomes and warrants explicit attention in public health work [2]. The literature has suggested that different religions may both hinder and enable good health [3]. For example, Ramadan fasting may pose health risks, while Islamic injunctions against sexual promiscuity and imbibing alcohol, as well as a recommendation against smoking, may promote health [4].

Understanding the culture, religion and providing health care services that are acceptable to Albanian community with islamic religion have particular challenge. Aim of the study is to describe the cultural, ethnical and demographic characteristics of the Albanian ethnic population with Islamic religion and their access to health care in a general practice in a village near Skopje, North Macedonia.

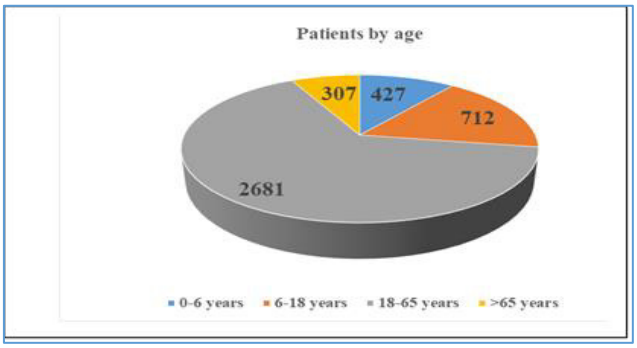
II. Material and Methods

Method: In order to obtain data that can be analytically processed, a descriptive study was planned with registered patients of Albanian nationality in the maternal outpatient clinic aged ≥ 0 months. The doctor's office is located in a village, 11 km from the capital Skopje, North Macedonia with patients from 6 surrounding villages. Two specialists of family medicine from Macedonian ethnicity and 3 medical nurses from Albanian ethnicity work in the medical teams.
Material: The data were collected directly from the electronic database of the registered patients of the office and the manually recorded data in the patients' paper health records, in the period from 19.05.2023 - 01.06.2023. Data collection was conducted on the following characteristics: gender, age, education, employment rate, smoking status, contraceptive rate in women with oral contraceptive therapy, visits for management of chronic conditions, collected prescription drugs for chronic diseases, preventive programs and immunization according the regular immunization calendar.

III. Results

The following results were obtained by analyzing the collected data from the electronic database and manually written data in the patients' paper records. From 4217 patients, 4137 from Albanian, 77 Macedonian and 3 patients from Turkish ethnicity are registered in the GPs practice from ≥ 0 years. All patients of Albanian nationality are of Islamic religion. Communication between the medical personal and the patients mostly is in the Albanian language. According to the gender distribution among patients of Albanian nationality, 2117 were females, while 2020 were male patients. By distribution of age, the obtained data are given in *Figure 1*.

Figure 1. Distribution of patients by age



According to education, among patients under the age of 50, >70% have completed secondary school, among patients over 50 years of age, >45% have primary school, while female patients over 65 years of age ≈ 50% have no education. In terms of established employment between the ages of 18-65, 1069 are unemployed, 369 employed, 3 farmers and 6 foreign insured patients. Out of 369 employed patients of Albanian nationality, 302 are male and 67 patients are female. A large proportion of patients (75%) live in large family communities with ≥ 6 members. In the past 5 years there is increased emigration of young male patients and their families in the EU countries, but not and village- town migration in the country. Mostly families migrate to: Germany, Austria, Croatia, Slovenia, Switzerland and others.

Patients of Albanian nationality get married (100% religiously, but not always civilly regulated), at the age of 18-35 years, average at 23.5 years of age. Married couples in 34% have 0-2 children, 65% have 3-4 children, while about 1% have ≥5 children. Infants up to 1 year old are regularly taken for scheduled check-ups. The percentage of vaccinated children in 2022 according to the mandatory vaccination calendar is ≈ 94% (average value of received vaccines), while the average rate of revaccinated children is ≈ 88%. From 427 registered patients of Albanian nationality aged 0-6 years in 2022, 117 children (27.4%) were diagnosed with sideropenic anemia. In the same age group, ≈ 87% of children with caries were registered, mostly in the form of circular caries.

Patients expect immediate health care for any acute condition (regardless of the level of urgency) and very often they seek medical help in emergency centers. In the other side, they often postpone preventive check – ups and control examinations for acute and chronic diseases. Data on performed screening for patients aged 35-65 years for preventive examination for early detection of diabetes mellitus, kidney diseases and cardiovascular diseases were extracted for the period 2017-2019, in order to avoid the impact of the COVID pandemic on them (*Table I*).

Table I. Screening examination data for Diabetes Mellitus, kidney diseases and cardiovascular diseases in period 2017-2019

Year	Planed patients N	Showed patients n (%)	Invited patients by post-mail N	Showed patients after invitation n (%)
2017	484	144(29.7%)	340	19 (5.6%)
2018	489	270 (55.2%)	219	2 (0.9%)
2019	487	197 (40.5%)	290	8 (2.8%)

According to the recorded data in the health record of female patients, gynecological visits are regular, with a small number of abortions. In the office, 927 patients in the reproductive period aged 15-49 have been registered, 5 of them use oral contraceptive therapy. Female patients who are not married, don't have their own gynecologist and in extremely rare cases visit one and usually consult their family doctor for their gynecological problems. Young married couples who cannot have children are 100% actively treating their infertility. Among patients of Albanian nationality, not a single adoption of a child has been registered in the past 16 years. Among the patients, there is a very high percentage of smokers with 42% (≥ 11 years old 1360 of male, and 196 of female patients) and 1 patient registered as alcoholic.

Regarding registered chronic diseases, due to the existence of Registry for Diabetes Mellitus (DM) and chronic renal

failure (CKD) in the Republic of North Macedonia, data were extracted only for these diseases. In the office in 2021, 183 patients with diabetes mellitus were registered, of which 2 patients with DM type 1. According to gender distribution, 60 (32.8%) are male, while 123 (67.2%) are female patients of female gender. The prevalence of DM in N Macedonia in 2021 is 135,690 patients, of which 1,091 patients are registered with DM type 1. According to gender distribution, 59,870 (44.12%) are male patients, while 75,820 (55.88%)) are female. The prevalence of diabetes in N Macedonia per 100,000 inhabitants was 6533.9, i.e. 65.34 per 1000 inhabitants, while the prevalence of patients registered in the office was 43.39 per 1000 inhabitants.

In N Macedonia in 2021, 3576 patients with chronic renal failure (CKD) were registered. According to gender distribution, 1929 (53.9%) are male, while 1647 (46.1%) are female patients. In 2021, 7 patients with CKD were registered in the office. According to gender distribution, 4 (57.1%) are male patients, while 3 (42.9%) are female. The prevalence of CKD in NMacedonia per 100,000 inhabitants was 172.2, ie 1.72 per 1,000 inhabitants, while the prevalence of patients registered in the office was 1.66 per 1,000 inhabitants. All registered patients with CKD in the clinic are on medical therapy.

In the office, there is an internal system for scheduling examinations by phone from 27 March 2023, but on average less than 10% of examinations on a daily basis are scheduled. Most often, the appointment system is used by young mothers to schedule an examination for their children.

According to the data on completed prescriptions in pharmacies in the period from 2017-2019, a reduced number of completed prescriptions can be observed in the quarter of the year in the post-Ramadan month.(*Table II)*

Table II. Completed prescriptions for prescribed medications in pharmacies for 2017-2019

year	I quarter (%)	II quarter (%)	III quarter (%)	IV quarter (%)
2017	94%	63%	75%	91%
2018	96%	61%	82%	93%
2019	94%	66%	86%	97%

IV. DISCUSSION

This study describes the cultural, ethnic and demographic characteristics of patients of Albanian nationality and their influence on the use of primary health care services in the Republic of N Macedonia. The study included 4137 patients of Albanian nationality in a village near by capital city Skopje. In order to overcome the language barrier, the communication between the medical personal and the patients mostly takes place in the Albanian language. But as the author Kaj J points out in his article, achieving effective communication means more than overcoming language barriers. Because of that, we as medical professionals need to value diversity as an integral part of our consultation skills [5]. According to the processed data, all patients of Albanian nationality are of the Islam religion. The gender distribution is almost equal, with a slight predominance of female patients at 51.17%. In distribution of education rate, we can notice a high rate of illiteracy among the older population, especially among the female population, and a high rate of secondary vocational education among the younger population. This is due to the existing law on compulsory primary and secondary education in N Macedonia adopted in 1995, according to which a child who does not attend primary and secondary school without a justified reason is subject to monetary and criminal sanctions for the child's guardian. Regarding the employment rate, a low employment rate of 34% was observed, of which only 6.2% were female patients. The total rate of registered employment does not correlate with the actual situation, because most of the patients work without being registered, ie. in the "gray" economy. The low employment rate among female patients is primarily due to the need to look after the children (the nearest kindergarten is 11-16 km away from the place of residence) and to take care of elderly family members.

In the past 5 years, an increased migration of young families to EU countries has been registered, but not an increased rural-urban migration within the country itself. The most common reason for this migration is of course the higher wages offered to workers, the higher economic standard and the social protection of the population in the EU member states. But despite the migration, the patients keep their health insurance with us and appear in the lists of active patients and it is difficult to calculate the percentage of migration.

Patients of Albanian nationality get married early, which is always religiously regulated, while the civil marriage is regulated after several years of entering into a religious one. A small part of the patients do not enter into a civil marriage at all. Due to the above, the number of registered divorces is very small. According to the obtained data, the largest number of young families have 3-4 children, while on average in the entire Republic of N Macedonia, families of Macedonian nationality have 0-2 children. Regarding that, we can directly conclude that the birth rate is higher compared to the population of Macedonian nationality. The rate of immunization according to the mandatory vaccination calendar is very high, compared to the official data on vaccination performed in 2022 in N Macedonia. The percentage of vaccinated children according to the mandatory vaccination calendar is ≈ 94%, which is 16.5% higher than the national average vaccination rate of 75.5% in 2022. This number is explained by the trust in education by family doctors and patronage nurses and the small influence of social media in creating attitudes about vaccination in this environment. The average rate of revaccinated children is ≈ 88%, which is 8.8 % higher than the average revaccination rate for 2022, which is 79.2% at the national level but still it is less then safe coverage rate which should be over 95%. The reduced percentage of revaccination is explained by the irregular controls of children after 1 year of life and the emigration of families from the country.

Infants up to 1 year of age are regularly taken for a scheduled check-up, which is extremely important for

monitoring the correct growth and development of children at the first year. An exceptional problem is observed in childhood with iron deficiency anemia in almost 1/3 of children aged 0-6 years. Bad eating habits: use of food from "bags", highly processed food, consumption of a large amount of cow's milk, snacks and juices, are the most common reasons for the development of iron deficiency anemia in children. In children of this age, a high percentage of ≈ 87% of caries in milk teeth was registered, compared to the data from the Ministry of Health for 79.5% of children with caries at the age of 6 in 2018. The predominant form is circular caries, which is associated with long-term use of a bottle with a pacifier, through which milk or juice with the addition of sugar is usually consumed. The poor dental health is also a consequence of the bad eating habits, low dental hygiene and late visits to a dentist.

Although there is an appointment system in the office, which should provide an organized and safer health environment for patients, the percentage of patients who use it is still small. Patients expect immediate health care for any acute condition (regardless of the level of urgency), while they often postpone preventive and control examinations for chronic diseases. The rate of screening programs is not at a satisfactory level. In the following 3 years (2017-2019), out of an average of 486 per year, an average of 186 patients (about 38%) showed up for an examination, 283 (62%) patients were sent an invitation by mail, of which only in an average of 9% responded to the invitation for a preventive examination. This is due to low health education and the need of an examination only at the moment of feeling sick.

According to the data in the health records, unmarried female patients very rarely visit a gynecologist and usually consult their family doctor for their gynecological problems. In this area patients consider that issues related to sexual and reproductive health (SRH) are sensitive subjects and they rarely discuss for them, even with health workers [6]. On other side gynecological visits are regular for married patients and they visit gynocologists regularly especially during the reproductive period. The use of contraceptives is on a low rate which is very similar to the use of oral contraceptive therapy among the female population in North Macedonia. Among the female patients in reproductive period in the office is registered small number of abortions which in correlation with the data on the low level of use of oral contraceptive therapy indicates that young families consciously plan the number of children they would have. The patients in this region understand the burden of infertility and they accept in-vitro fertilization, only with material from both spouses.

Most Muslims are known to share strong family values and patriarchal culture, which in certain situations could benefit young individuals and protect their well-being [7]. According to the Muslim religion, patients do not drink alcohol or use of drugs which has a positive impact on the health of the population. Among the population there is a very high percentage of smokers (42%), but lower in comparison with the smoking rate in North Macedonia which is about 48,4% of smokers. There is a big difference in the distribution of smokers according to genders compared with the country statistics, that is more than 73,6% of men and less than 10.2 % of the female patients (the prevalence of smoking in North Macedonia is 57.9 percent among men and 39.0 percent among women).

In relation to the presented data from registered patients with diabetes mellitus in 2021, a lower prevalence can be observed in relation to the prevalence of DM in N Macedonia by 33.6%, but with a much higher prevalence in female patients in relation to male gender. All this is explained by the greater physical activity that patients have in the rural environment, a large part of the male working population are workers in the construction industry, while the majority of the female population are housewives who maintain their homes and do not have additional physical activity. In relation to the presented data from registered patients with CKD in 2021, an almost identical prevalence can be observed in relation to the prevalence of CKD in N Macedonia, with no patient on any type of dialysis treatment, which points to timely diagnosis and continuous monitoring of patients with this disease.

Adherence to the prescribed therapy is at a high level, with the exception of the month of Ramadan and the month after when the majority of patients change the prescribed daily dosage regimen and some completely stop the therapy. The month of fasting has a great impact on the daily life of the Islam population, which has a direct impact on adherence to therapy in this month and the month after and increased percentage of complications caused by reducing prescribed doses. Author Aslaam M in two separate studies [8,9], refers to the great influence of the month of Ramadan on the change of the prescribed tablet regimen and the compliance of Muslim believers during the 30 religious days. This data should be taken into account when prescribing therapy, especially in the dosage regimen and the method of application for chronic, but also for acute diseases.

The study analyzes data from patients from the Albanian ethnic community in a closed village environment, which limits the study and the conclusions drawn in it cannot be generalized for the entire Albanian population in N Macedonia.

V. Conclusion

The study provided comprehensive data that are extremely important for the improvement of health services in the outpatient clinic, and also provides an opportunity to plan future checks in the direction of improving health promotion, prevention, diagnosis and management of patients' diseases. Cultural, ethnical and demographic characteristics are important determinants of population health outcomes and need to be recognized by health systems. At the same time, they essentially influence the shaping of the behavior of individuals towards their own health and the health of the family, outside of the framework of the health system. The goal of culturally competent health care services is to provide the highest quality of care to every patient, regardless of cultural or ethnic background. Family doctors are the first contact of patients with the health system and should be properly trained to provide health care appropriate to the attitudes, expectations and needs of different ethnic communities represented in their work environment.

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Quality Assessment of Interprofessional Approach to Elderly Care in Family Medicine in Slovenia

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***Abstract*—In Slovenia and worldwide an interprofessional approach is increasingly used in the elderly care in family medicine clinics with the aim of improving the quality of patient care. By developing quality indicators we will be able to quantitatively assess the quality of the interprofessional approach, identify place for improvement, introduce measures and thus enable continuous quality improvement.**

***Index Terms*-- elderly, family medicine, interprofessional, quality**

In Europe, an interprofessional approach is increasingly used in the elderly care in family medicine clinics with the aim of improving the quality of patient treatment [1-4].

There is little evidence in the national and international literature that the introduction of an interprofessional approach to the treatment of patients at the primary level of adult healthcare has achieved its purpose of improving treatment and to what extent [2-7]. The interprofessional approach to the elderly care and other patients in family medicine clinic (FMC) has so far been researched primarily qualitatively with the aim of examining what defines it, what are its advantages, what are the encouraging and inhibiting factors in cooperation between interprofessional experts at the primary level, and what is the satisfaction of experts and patients with such an approach [5,7-12].

Many questions arise: What is the conceptual framework of interprofessional elderly care in family medicine in Slovenia? What is a quality interprofessional approach? How to measure the quality of an interprofessional approach? What are the peculiarities of the interprofessional elderly care in family medicine care in Slovenia? How to measure the quality of the interprofessional approach so that the measuring instruments are adapted to the conditions in the Slovenian healthcare? We will try to answer these questions in a scientific way with the consensus of opinions of experts in this field.

After reviewing, analyzing and synthesizing the literature in this field we found out that quality indicators have not been developed yet for an interprofessional approach to elderly care in family medicine. By developing quality indicators from this area, we will be able to quantitatively assess the quality of the interprofessional approach, identify areas for improvement, introduce measures and thus enable continuous quality improvement.

I. Material and Methods

We will conduct a mixed methods study [13,14]. In the first part, we will use qualitative methods [15] with focus groups and the method of grounded theory by Glaser and Strauss [16] and the RAND/UCLA Appropriateness Method [17]. The name of the method comes from the names of the inventors - it was developed in cooperation between the non-profit institution RAND (Research and Development) and UCLA (University of California Los Angeles). In the second part, the research will be quantitative in conducting a cross-sectional survey [18]. Fig. 1 demonstrates graphic presentation of the methodological part of research.

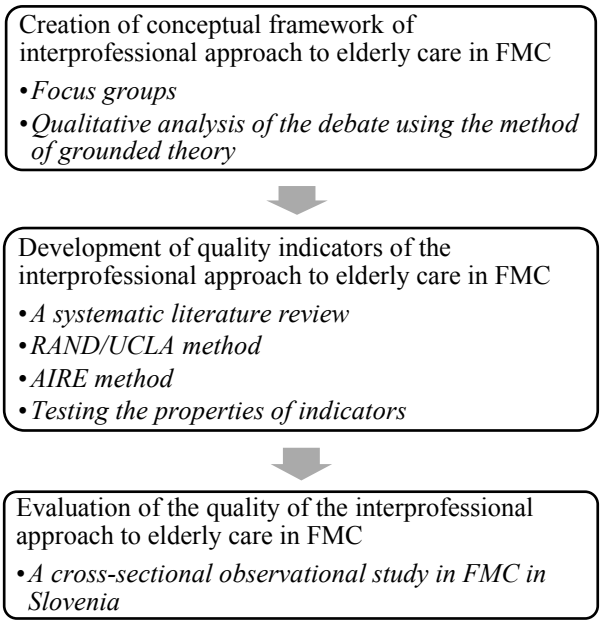

Figure 1: Graphic presentation of the methodological part of the research.

Description of the subjects and methods:

In the first part of the research a qualitative methodology is used: Experts in the field of quality and primary healthcare for adults based on their professional background and competences and representatives of patient associations will be invited to a focus group discussion on the interprofessional elderly care in a FMC. The number of focus groups will depend on data saturation. When the data, statements, attitudes of the participants begin to repeat and we no longer get any fresh ideas, we will end the research [19]. The discussion will be qualitatively analyzed using the grounded theory method to determine the conceptual framework of the interprofessional elderly care in a FMC in Slovenia. The conceptual framework will define the areas and processes that describe the interprofessional approach to the elderly care in a family medicine care in Slovenia, and will be based on theoretical starting points and practical experience [20]. The created conceptual framework will serve us as a theoretical starting point for the development of the quality indicators of interprofessional approach to elderly care in a FMC in Slovenia according to the RAND/UCLA method, which is the only systematic method that harmonizes the opinion of experts and scientific evidence [17]. As part of the RAND/UCLA method, we will carry out a systematic review of domestic and foreign literature on the quality indicators of the interprofessional approach to the elderly care in the PubMed [21] and Science Direct [22] databases using the search terms (interprofessional) AND (family medicine OR general practice OR primary care) AND (quality). In the Pub Med database [21], the inclusion criteria for the articles will be free access, human species, people over 19 years old, English language. The exclusion criterion for an article will be publication age > 5 years. In the Science direct database [22], the inclusion criteria will be a systematic review article and a research article and dealing with the field of medicine, dentistry, nursing and other healthcare professions. The exclusion criterion for an article will be publication age > 5 years. We will create quality indicators based on the systematic literature review and select a range of 8 to 12 experts who will be asked via e-mail to check the evidence and evaluate the suitability of the first version of the quality indicators. Suitability will be assessed by numerical scale from 1 to 9, where 1 indicates very low suitability and 9 indicates the highest suitability. The experts will not know about each other and will give their opinions independently of the opinion of others. In the next step experts will participate in a joint meeting, where they will receive for each quality indicator their own assessment of the appropriateness and frequency distribution of assessments of all the experts. This will be the basis for the discussion. After discussion, they will reassess the appropriateness of each quality indicator on a numerical scale from 1 to 9. We will assume that the experts agree on the indicator if the number of experts who evaluate the indicator outside the three-point region (1-3, 4-6, 7-9), which contains the median, is less than or equal to 2 and that they do not agree on an indicator if at least 3 experts will rate the same indicator with a score of 1-3 and at least 3 experts with a score of 7-9. We will classify the indicators into three levels of appropriateness: suitable (median scores between 7 and 9, no disagreement), uncertain (median scores between 4 and 6 or any median with disagreement), unsuitable (median scores between 1 and 3, no disagreement). We will consider only the quality indicators for the interprofessional approach to elderly care in the FMC, which are suitable and tested to prove acceptability, feasibility, reliability, validity and usability [23,24]. Acceptability will be proven after a pilot study, where we will check with patients and members of the interprofessional team whether the findings from the collected data are acceptable to them. Feasibility is confirmed by the RAND/UCLA method, the feasibility rating on a scale from 1 to 9 (the higher the rating, the easier the feasibility) and a pilot study.

The reliability of the quality indicator will be checked by the method of internal consistency and expressed by Cronbach alpha coefficient value (for reliability we will take the limit at 0.7 and indicate the standard error of the calculation).

Validity:

◦ the face validity of the indicator will be confirmed by the RAND/UCLA method (suitable).

◦ content validity will be determined using the RAND/UCLA method.

◦ construct validity will be determined by factor analysis.

◦ indicators developed according to the RAND/UCLA method have proven predictive validity.

The usefulness of the indicators will be assessed on a scale from 1 to 9 points as low (1-3 points), medium (4-6 points) or high usefulness (7-9 points). To evaluate the methodological properties of the developed indicators, we will use the AIRE instrument (Appraisal of Indicators through Research and Evaluation Instrument) method, which is a valid and reliable instrument specifically based on the assessment of the quality of the quality indicators. It was derived from the AGREE instrument (Appraisal of Guidelines Through Research and Evaluation instrument), which is a widely used standard for assessing the methodological quality of practice guidelines. The AIRE includes 20 items that address four quality domains of quality indicators. Each item includes a statement on the quality of the quality indicators and is rated on a four-point numerical scale (from 1 which means no information or strongly disagree to 4 which means strongly agree). Items from these domains are scored by two independent reviewers and summed across domains. Then a standardized domain score is calculated according to the instrument's guidelines using the formula: (all points-minimum possible points)/(maximum points-minimum possible points) x 100%. A higher standardized score indicates a higher methodological level of quality (range 0-100%). Quality indicators have high methodological quality for a domain if they are rated at 50% or higher, which correlates with "agree" or "strongly agree" [25].

In the second part, the research will be quantitative in the form of a cross-sectional survey. We will use the developed quality

indicators to determine the quality of interprofessional approach to elderly care in family medicine in Slovenia. In the cross-sectional study on the quality of the interprofessional approach to elderly care in family medicine we will include, according to the system of simple random sampling of the selected FMC and according to the system of sequential sampling, elderly people living at home aged 65 years or older, who were treated interprofessionally at the primary level who are able to complete the questionnaire independently and who have been registered in a FMC for at least one year. Among the 974 FMC, we will invite a random sample of 100 Slovenian FMC to participate using the simple random sampling system with the Research randomizer computer program [26]. Each participating FMC will include in the research 7 consecutive patients who were treated interprofessionally, which means that the patient was treated by at least three different experts at the primary level. The number of seven patients was chosen in order to ensure that the assessment of the quality of the interprofessional approach to elderly care in FMC would not be too long for the participating general practitioner to complete and to obtain a sufficiently large sample at the same time. To obtain data for quality indicators, general practitioners will review the medical records of selected consecutive patients who were treated interprofessionally and provide us with the data. If the invited FMC refuses to participate, we will randomly select and invite a new FMC from the non-invited FMC, and so on until we obtain a sample of at least 700 subjects or invite all FMC in Slovenia to participate. For potential quality indicators that will require patients point of view, patients will also be invited into the research to fill out the questionnaire. In addition to data on the quality indicators of the interprofessional approach to elderly care in FMC from the patient's medical records, we will also collect data about patients referrals (destinations and dates of referrals), characteristics of patients and characteristics of FMC. We will determine whether there are factors that are statistically significantly associated with a high-quality interprofessional approach to elderly care. We will compare the size of the FMC (the criteria will be the number of identified patients, number of standardized quotients[1] [27], average number of patient visits in the last 5 working days), the location of FMC (city municipalities, settlements with more than 3,000 inhabitants that do not belong to city municipalities or rural areas) and distance from the other members of the interprofessional team (in the same building/in the immediate vicinity or not), whether it is a private outpatient clinic with concession or a FMC in the public health network, the doctor's level of education (specialist or resident in family medicine), years of work experience as doctor in family medicine and characteristics of patients (gender, age, location of residence). For the statistical analysis of the data from the cross-sectional survey, we will use the analysis of the distribution of the values of the measured variables: frequency distributions, arithmetic mean, standard deviation, Chi square test, t-test. For the statistical analysis of the data on the assessment of the quality of the interprofessional approach to elderly care, we will use the assessment of the quality of the interprofessional approach to the elderly care as independent variable, and the FMC and patient characteristics will be the dependent variables.

II. Results

This mixed methods study on quality assessment of interprofessional approach to elderly care in family medicine in Slovenia has three main objectives:

Objective 1: To develop quality indicators for the field of interprofessional elderly care in family medicine in Slovenia.

Objective 2: To assess the quality of interprofessional approach to elderly care in Slovenian FMC with the help of developed quality indicators for interprofessional treatment.

Objective 3: To develop a multivariate model of interprofessional approach, which will predict the quality of interprofessional elderly care in Slovenian FMC.

After reviewing the literature in this field in the PubMed [21] and ScienceDirect [22] databases, we did not find quality indicators for interprofessional approach to elderly care in family medicine. The added scientific value will be the development of quality indicators for interprofessional approach to elderly care in a FMC, adapted to the healthcare system in Slovenia. With quality indicators we will be able to evaluate the quality of interprofessional approach to elderly care in FMC in Slovenia.

III. Discussion

The design and implementation of quality indicators is a special challenge in the primary health care of adults, as FMC are geographically scattered, organized differently, with different assessments of independence in functioning and with progress in medicine the complexity of treatment at the primary level increases [28]. The development of quality indicators for an interprofessional approach to elderly care will be adapted to the conditions in Slovenian healthcare system. With the developed quality indicators, we will be able to quantitatively assess the interprofessional approach to elderly care in Slovenia. By evaluating the interprofessional approach, we will be able to discover its shortcomings, which will give the interprofessional team the opportunity to improve its performance and thus the quality of the interprofessional elderly care.

We expect that the quality of interprofessional approach to elderly care will be related to workload [29]. In FMC with less

[1] Workload was defined as the number of patients on the physician's list, weighted to take into consideration the age of the patients. The sum of the scores of all the patients on the physician's list yielded the number of standardized quotients [27].

identified patients/fewer standardized quotients, the doctor has more time for in-depth elderly care and consultation with various experts at the primary level healthcare. A general practitioner oversees the holistic elderly care and, as the team leader, decides on the treatment procedures and referrals of the elderly to the others experts. The quality indicators will show whether and where there are still opportunities for improvement of interprofessional elderly care. The model of development of quality indicators adapted to the Slovenian situation will be an original contribution to knowledge and could become an exemplary model for development of quality indicators in or other medicine fields in Slovenia and elsewhere.

ACKNOWLEDGMENT

The authors gratefully acknowledge the contributions of Špela Miroševič to the methods of the research.

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How to confront violence in healthcare

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Abstract— **Background:**

Workplace violence (WPV) encompasses physical violence, harassment, intimidation, and disruptive behavior at the workplace. As an increasingly common phenomenon in the healthcare environment, it is affecting and involving healthcare workers, patients, clients and visitors. Only a safe and peaceful working environment enables the delivery of a high quality, professional and patient-friendly healthcare.

Methods:

In 2017, a multidisciplinary group was established at the Medical Chamber of Slovenia. In addition to its other activities, the group of experts also conducts interactive trainings in which a police inspector, a bachelor of laws, a psychiatrist, a registered nurse, and a family practitioner/specialist of family medicine. Following an online research I terms od needs-assessment, an educational modul was prepared. The training is intended for all healthcare workers. It consists of a 4 hour interactive workshop, which is typically conducted in the health setting of the hosting institution.

Results:

The results of the research showed that 71.4% of all surveyed health workers were already victims of violence by the patient or the patient relatives and 31.6% by colleagues. 17 % of those surveyed were already victims of physical violence. 48 % were exposed to violence in the primary care clinic, 35% in the hospital department and 32 % in the specialist outpatient clinic.In 57% of health care workers, they want additional training in the field of prevention, recognition and protection against violence.The workshop has been conducted four times, three times in the hospital environment and once in a healthcare centre in a small town. More than 100 participants were actively contributing to the contents of the workshop by discussing the vignettes provided by the group as well as discussing their own cases and dilemmas. Their anonymous evaluation sheets reflect satisfaction with the workshop.

Conclusion(s):

While workplace safety is primarily management's responsibility, healthcare workers also play an active role. Knowledge is pivotal in recognizing and addressing violence. By enhancing the competencies to prevent, recognize or confront violence at various educational levels, the workshop described in this presentation aims to create safer healthcare settings for patients and staff. Only a safe and calm working environment can guarantee a professional, competent and high-quality healthcare.

In this paper, an example of needs assessment and building capacity activity in the form of educating medical staff in their own environment as a form of continuous medical education (CME) will be described.

Index Terms-- violence, healthcare, working place safety

I INTRODUCTION

Tragic outcomes and increasing frequency of reports on violent incidents suggest the need for raising awareness and raising competencies of the healthcare workers in this domain.

In its 1996 resolution, the World Health Organization (WHO) defined violence as a major and escalating threat in the world, therefore the prevention of violence is presented as a public health priority [1]. Violence causes short-term, long-term and lifelong consequences for the individual, as well as for the community, wider environment and health systems [2].

Compared to the epidemic of chronic diseases, violence is more widespread and preventable, and therefore a greater challenge to global health [1,3]. Although research findings prove that biological and other factors can predispose to violent behavior, violence is most often the result of their interaction with external factors. In the ecological model, violence is conditioned by the interaction of an individual with another individual, family, community and society. In order for a behavior to be defined as violence, it must involve intent, physical force or power and cause consequences [1]. Today, violence is a global problem that is rapidly expanding. Violence at the workplace occurs almost everywhere, the health profession is particularly at risk, where almost a quarter of all violence at the workplace occurs [4]. According to data from the European Agency for Safety and Health at Work [5] from 2007, the health and social sectors are characterized by the highest exposure to violence at the workplace; in the EU 27 the incidence rate was 15% [5].

Healthcare workers are at high risk of violence worldwide. Between 8 and 38 percent of healthcare workers experience physical violence at some point in their career. Many are exposed to verbal violence. Among the categories of health workers most at risk are nurses and other personnel directly involved in patient care [6].

Among healthcare workers, some consider workplace violence to be a "conscious occupational risk" or even self-inflicted. Psychological violence often remains unrecognized, and is often not perceived as violent behavior and is not reported [7]. Knowledge and recognition

of various forms of violence are essential for effective reporting of violent incidents at work and for taking action [5]. An examination of the accessible databases of the National Institute of Public Health (NIJZ) and the Institute for Health Insurance of Slovenia (ZZZS) does not allow for determination; nor monitoring the frequency of workplace violence and its health consequences [7]. The Slovenian area is characterized by a high degree of criticism of the healthcare system. Dissatisfaction and the resulting tension is the result of a gap between wishes and possibilities, between promises and reality, often the result of organizational deficiencies in health care, biased media reports, and personnel and material shortages [8].

The Slovenian Medical Chamber (SMC) firmly supports the principle of zero tolerance towards violence against the medical profession. SMC strives for employees, patients, relatives and visitors to know, understand and support this policy. In any healthcare system, it must be clear to employees, patients and relatives that violent behavior will not provide benefits, advantages or advantages, but will lead to legal and administrative consequences (e.g. interruption of medical care)[7]. These goals were set by the interdisciplinary group "Don't allow violence", which was established in 2017 at the SMC. Various experts were included in the group (nursing representatives, lawyers, police representative, specialists in traumatology, gynecology, dentistry, psychiatry, family medicine).

II MATERIAL AND METHODS

With the research, we wanted assess the frequency of violent events compared to violence 10 years ago and to find out the needs of employees for training. Based on the results of the research, we wanted to create Recommendations for the prevention of violent incidents and a training plan for employees (measures to prevent outbreaks of violence). We asked ourselves the following research questions: How many respondents have already been victims of physical violence? What are the most common causes of violence? Which healthcare workplaces are most exposed to violence? How many employees need additional training in the field of prevention, recognition and protection against violence?
We used the quantitative method of research and the method of description. The data was collected using a structured questionnaire, using the online survey technique. The research was based on professional and scientific literature, the results of research in the field of violence against doctors both in our country and abroad. We took into account our own clinical experience as well as realistic possibilities. based on professional and scientific literature, the results of research in the field of violence against doctors both in our country and abroad. We took into account our own clinical experience as well as realistic possibilities.

RESEARCH INSTRUMENT DESCRIPTION

We used an adapted version of an already tested survey questionnaire [5], which was modified by the members of the expert group, for the sake of comparability of the results. The questionnaire consisted of 33 questions, divided into three parts. The first set included demographic questions (gender, age, region, occupation, form of healthcare activity, length of service, etc.), the second part consisted of set of work habits/characteristics of work (closed and semi-open type of questions, with the possibility of one or more answers) and the third the set of perceptions of violence at the workplace (closed and semi-open type of questions, with the possibility of one or more answers and two tables, where the respondents are asked to determine the frequency of violence based on the stated claims. In the open question, however, the respondents described the violent event that they most hurt in his professional life.

SAMPLE DESCRIPTION

A purposive sample was used.
Medical faculty graduates without additional training (35), trainee dentists (8), trainees for various specialities, including specialists in GP/FM (231), general practitioners without specialization (39), specialists (870), dentists without specialization (292), nurses (13), nursing technicians participated in the survey (4), administrators (4), others (22), whose occupation was not specified, defined it as "other", who were members of the SMC in 2018. The survey was completed by 421 men (28.2% of all respondents) and 1051 women, representing 70.4% of all respondents, the rest (1.3%) did not specify their gender. The average age of all respondents was 46 years, the average working time 19 years and the average working time in the current job 12 years. The largest number of respondents come/work in the Ljubljana region (544 respondents), and the least in the Zasavje region (18 respondents).

DESCRIPTION OF RESEARCH AND DATA PROCESSING

The research took place from 12 April 2018 to 16 May 2018 with an online survey (1KA). Participation was voluntary. Anonymity was guaranteed. In the data analysis, we focused on secondaries, trainee dentists, specialists, general practitioners without specialization, specialists and dentists without specialization. To present the results, we used descriptive or descriptive statistics. We have also presented important results in tables. To analyze the association of variables, we calculated different statistics according to the type of measurement scale of the variable. Since both independent variables had nominal measurement scales, we calculated Pearson's Chi-square. We calculated the correlation between the independent variable gender and the dependent variables of questions Q15 (violence at the workplace), Q16 (forms of violence).

III RESULTS

Forms of violence

Physical violence by patients was reported by 17% of doctors [9].

Table 1 shows the forms of violence according to incidence/frequency in the past calendar year

Table 1: Frequency distribution of forms of violence in the previous calendar year (*Vir:* Raziskava, 2018 (Čebašek-Travnik, 2018)[9]

Forms of violence	more than 50 times		from 10 to 50 times		from 5 to 10 times		4 to 5 times		never	
	N	%	N	%	N	%	N	%	N	%
a. Arguing	72	6,4 %	199	17,6%	237	21,0%	416	36,8%	205	18,2%
b. Rude and disrespectful behavior	114	10,4%	256	23,4%	221	20,2%	360	32,9%	143	13,1%
c. Threatening with fists	5	0,5%	19	1,9%	40	4,1%	183	18,8%	729	74,7%
d. Various disrespectful gestures	10	1,0%	27	2,8%	61	6,4%	207	21,7%	649	68,0%
e. Insults and cursing	49	5,0%	108	11,1%	153	15,7%	381	39,1%	284	29,1%
f. Metanje predmetov	1	0,1%	15	1,6%	48	5,1%	158	16,8%	718	76,4%
g. Harassment and intimidating/ bullying	13	1,3%	44	4,6%	103	10,7%	337	35,0%	466	48,4%
h. Oral or written threats	13	1,3%	40	4,1%	83	8,6%	360	37,2%	471	48,7%
i. Visual/verbal sexual harassment	1	0,1%	10	1,1%	16	1,7%	75	8,0%	831	89,1%
j. Physical sexual harassment	1	0,1%	3	0,3%	6	0,6%	58	6,2%	865	92,7%
k. Sexual harassment with obscene language	4	0,4%	6	0,6%	30	3,2%	129	13,8%	769	82,0%
l. Hitting, kicking and other forms of physical violence	0	0,0%	0	0,0%	3	0,3%	41	4,4%	888	95,3%
m. Unauthorised invasion of privacy	3	0,3%	12	1,3%	41	4,4%	170	18,1 %	715	76,0 %
n. Unauthorised physical and vodeo recording	0	0,0%	4	0,4%	10	1,1%	116	12,4%	809	86,2%
o. Other	1	0,2%	7	1,4%	5	1,0%	19	3,8%	472	93,7%

a. Example of a Table footnote. *(Table footnote)*

On average, respondents estimate that they have been the victim of an argument 5 to 10 times in the past year. On average, they estimate that they have been the victim of rude, insensitive and disrespectful behavior from 5 to 10 times in the past year, the victim of insults, cursing and the use of derogatory terms up to 5 times in the past year, the victim of harassment and intimidation/bullying (also with gestures) up to 5 times in the past year and that they have been the victim of verbal or written threats, including hate speech or threats by e-mail, telephone, on social networks up to 5 times in the past year.

Analysis of the correlation of dependent variables: forms of violence - Q16 and independent variables-gender

The assumptions of the chi-square ($\chi 2$) test are met for variables Q16a, Q16b, Q16d, Q16e, Q16g and Q16h (Table 2).

Assumptions:

H0: $\chi 2 = 0$ ... There is no association between gender and Q16a-Q16h in the population.

H1: $\chi 2 > 0$ ... There is an association between gender and Q16a-Q16h in the population.

For all selected variables, the $\chi 2$ value is greater than 0.

The exact characteristic level (p) is less than $\alpha = 0.05$ for variable Q16b (rude and disrespectful behavior) and variable Q16e (insults, cursing). We reject the null hypothesis for variables Q16b and Q16e at the 5% level of specificity. With a 5% level of specificity, we can claim that there is a connection between gender and the experience of violence in the form of rude and disrespectful behavior in the population. Also, with a 5% level of characteristic, we can claim that there is a connection between gender and the experience of violence in the form of insults and cursing in the population.

We chose Cramer's coefficient and Pearson's contingency coefficient to measure the strength of the association. The correlation between gender and variable Q16b is weak (0.099). Likewise with variable Q16e (0.131).

Women are more often subjected to violence in the form of rude and disrespectful behavior as well as insults and curses.

Perpetrators of violence

The perpetrators of violence are dominated (71.4%) by patients and/or their companions, this type of violence is called "client initiated violence". 31.6% of violent acts are caused by colleagues. 54.6% of respondents witnessed violence against another healthcare worker. 28.9% of respondents witnessed violence against a co-worker by another co-worker.

Correlation between dependent variables: workplace violence-Q15 and independent gender variables

The assumptions of the chi-square ($\chi 2$) test are fulfilled for most of the variables, as all values of the theoretical frequencies are greater than 5 (Table 4).

Assumptions:

H0: $\chi 2 = 0$ ... There is no association between gender and Q15a-Q15g in the population.

H1: $\chi 2 > 0$ ... There is an association between gender and Q15a-Q15g in the population.

For all variables, the $\chi 2$ value is greater than 0.

The exact characteristic level (p) is less than $\alpha = 0.05$ only for the variable Q15d - witnessing violence against a co-worker by another co-worker. We reject the null hypothesis for variable Q15d at the 5% level of specificity and accept the alternative hypothesis. At a 5% level of specificity, we can claim that there is a connection in the population between an individual's gender and his presence in the event of violence against a co-worker by another co-worker.

To measure the strength of the connection, we chose the root of Person's coefficient, since both variables have two values each (2x2 table). The value of the Person coefficient (-0.069) indicates a (very) low and negative association between the variables.

Men are more often witnesses of violence against a colleague by another colleague.

Other results

48% of the respondents were exposed to violence in the primary healthcare clinic, 35% in the ward and 32% in the specialist healthcare clinic.

Regarding solving conflict situations and outbreaks of violence in their work environment, 72.4% of doctors and 81.8% of dentists do not respond to violence or ignore it. Only 28.7% of doctors and 11.8% of dentists inform security guards or the police about a violent incident.

The consequences of exposure to violence were post-traumatic stress disorder (41.6%) and hypersensitivity to stressful events (34.9%). 39.8% of doctors exposed to violence felt excessive excitement at the possibility of a recurring event, 7.4% of participants in violent the event avoided talking about the violent event. 31.3% of doctors and 29.0% of dentists had a sense of hopelessness and the intractability of the situation.

The most frequently chosen protective measure in a medical institution or the workplace of the respondents is a form for medical personnel to report on violent patients and/or companions (401 respondents), followed by the constant presence of a security guard in the building (369 respondents). (149 respondents) have options for professional training in cases of violence and legal assistance, (124 respondents) have options for psychosocial assistance.

57% of employees in healthcare would participate in additional training in the field of prevention, recognition and protection from violence, 16% of respondents would not attend lectures, 28% of respondents were neutral regarding participation in training [9].

Capacity building-CME activities

At the time of this article, the workshop has been conducted four times, three times in the hospital environment and once in a healthcare center in a small town. The health organizations apply for the workshop at the SMC. The size of the group is adjusted to the interactive methodology of the module, up to 30 participants per workshop. More than 100 participants were actively contributing to the contents of the workshop by discussing the vignettes provided by

the group as well as discussing their own cases and dilemmas. Their anonymous evaluation sheets reflect satisfaction with the workshop.

IV DISCUSSION

Two cross-sectional surveys conducted by the SMC in 2007 and 2018 showed that violence against doctors is a serious public health problem and that psychological violence is on the rise. The research showed that women are more often subjected to violence in the form of rude disrespectful behavior and insults and curses; which raises concerns given that medicine as nursing is a feminized profession. The results of physical violence against doctors are comparable over a 10-year period: in 2007, physical violence by patients was reported by 22% of doctors, and in 2018 by 17%. The Slovenian healthcare environment was marked by two murders of doctors by patients, the murder of a dentist in 2007 and a specialist urologist in 2017. We conclude that the level of violence did not decrease in the 10 years between the two surveys. Actions that may have been taken during this time had no measurable results.

Through research, we found that the most exposed to violence are health workers in primary health clinics, followed by health workers in the department and specialist health clinics. Research in our environment shows that the risk of violent incidents is highest in general emergency medical services and emergency rooms. Doctors who make house visits and perform field work are particular exposed to the risk of violence. With a home visit, the doctor enters the patient's environment [10].

The results of a Spanish survey involving 1,826 members of the medical staff, 3 hospitals, and 22 primary health care institutions (city, urban environments) show that violence against employees in the health sector is a common phenomenon. Every tenth person has already been the victim of a physical attack, 5% even more than once. As a result of physical violence, emergency services are most at risk (48%), similar to what our research showed, followed by psychiatric services (27%). 64% of employees were exposed to verbal violence (threats, insults, intimidation), of which 34% more than once, and 24% repeated verbal violence. Medical technicians and nurses are the most exposed to physical violence because they are in most contact with the patient. Doctors are the next most often targeted by the perpetrators. Everyone receives insults. Unlike in our environment, where the targets of violence are mostly health care providers, threats are more often directed at those who make decisions, also with the aim of influencing their decisions. The research showed no correlation between the frequency of physical assault and the gender of the staff, and male staff members are more often targeted than their female colleagues [11].

In the USA, 13% of healthcare workers reported at least one physical assault, and 1.9 physical assaults also result in physical injury to employees and, as a result, long-term absenteeism [12]. Our research showed that 17% of respondents had already been victims of physical violence. In Slovenia, we do not have data on absenteeism as a consequence of violence against healthcare workers, because workplace violence in the healthcare environment is insufficiently and inadequately documented.

In England, there were 68,683 reported assaults against healthcare staff between 2013 and 2014. Most of these (69%) occurred in psychiatric or long-term care facilities. Most of the reported incidents were caused by patients and/or their families or caregivers [13].

In Slovenia, dissatisfaction, impatience and tension of the healthcare professionals are often transferred to patients and attendants in the waiting rooms. The distress of patients, relatives and even staff can be a reason for violence. The most common risk factors for violence are linked to the patient [7].

The research showed that around 70% of violent events in healthcare are perpetrated by patients and their relatives, half as many by colleagues and as witnesses of violence against a colleague by another colleague; according to gender definition, men predominate. The results warn us of the increase in mobbing, so in the future we will have to direct activities and measures to prevent mobbing in the workplace. Given that life expectancy is increasing, that chronic non-communicable diseases are on the rise; that healthcare environment is globally understaffed, we can expect increases in outbreaks of violence. Perpetrators will be either patients, attendants and or even colleagues.

The research showed (more than 50% of respondents) that there is no permanent presence of a security guard in medical institutions, which is one of the most important protective measures. In the USA, emergency department security officers are constantly present, a maximum of 2 companions are present with the patient, each emergency department should have an isolation room for agitated visitors, which should have video surveillance, there should not be any objects in the room that could be dangerous for (self) harm. In Great Britain, information about violent patients is accessible/spread within the health network, violent patients are denied home visits, violent patients/victims can be refused care, a personal physician can remove a violent patient from their patient list [8].

Among the protective measures against violence in healthcare, less than 20% of the respondents mentioned the possibility of "professional training in cases of violence" and "the possibility of legal assistance". Healthcare professionals require additional training; regarding prevention, recognition and protection from violence. We conclude that the guidelines of the expert group regarding the planned trainings for employees are justified.

ACKNOWLEDGMENT *(HEADING 5)*

The author gratefully acknowledge the contributions, input and devoted work of all members of the spedial interest group “Don`t allow violence”, and this article actually represents a joint effort of all of us.

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Examination of employee satisfaction at the Health center Zagreb-West

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Abstract

INTRODUCTION. The purpose of the research was to identify problems based on which it will be possible to implement interventions in order to improve the quality of the working environment in Health center Zagreb-West, while the purpose of the qualitative part was to determine which factors influence employee dissatisfaction.

MATERIALS AND METHODS. 239 (47.61 %) out of a total of 502 employees participated in the quantitative research, while 55 employees (10.96 %) participated in the qualitative part of the research. Data was collected through an anonymous survey questionnaire on employee satisfaction via the Google Forms online tool, which consisted of 29 questions. The first part included five general questions, and the other 24 questions were related to the research topic. Answers are given using a Likert scale or a numerical rating. Average values between observed groups were analyzed by Student's t-test

RESULTS. A total of 11.3% of respondents were male, the most represented were employees aged 31-40, 65 of them (27.2%). Almost a third of respondents had completed high school. The largest number of employees worked in family medicine (38.5%). 40.6% of employees worked in the health center for less than 5 years. The largest number of respondents rated their job satisfaction as 4 (44.4%). 36% of the respondents gave the work organization a rating of 3. A third of the respondents never received feedback from their superiors about the work they perform, and the relationship with their superiors was rated 3.45. The efficiency of the administration was rated 2.51. Half of the respondents expressed satisfaction with their colleagues at the workplace, but two thirds of the respondents experienced discrimination at the workplace. Only 8 % of employees are completely satisfied with being informed about the situation in the health center. Another job would be accepted immediately by 14 % of respondents, and insufficient pay was cited as the main reason for changing jobs (65 %). The largest number of employees (85 %) specified a higher salary as a work motivation. A quarter of employees did not attend a professional meeting during the past year, and 87 % of respondents answered that they wanted the health center to organize professional lectures. 88 % of respondents used the institution's internet for information. Employees in family medicine, compared to other employees, rated the following items with a lower rating: job satisfaction (3.41 vs. 3.97), feeling at the workplace (3.24 vs. 3.78), work organization (2.50 vs. 2.93), supervisor's evaluation (3.12 vs. 3.58), utilization of working hours (2.90 vs. 3.88).

CONCLUSION. Health institutions should develop strategies for achieving a higher level of employee satisfaction because such employees are more productive, and their satisfaction affects the quality of services.

***Keywords* – Health center, Health personnel, Job satisfaction**

I. INTRODUCTION *(HEADING 1)*

In the healthcare system, employee satisfaction is reflected in their behavior at the workplace. It is necessary that the employee is satisfied with their job and work in order to be able to use all of the employee's potential (1). Job satisfaction factors can be divided into two categories, organizational and personal (2). The first category includes organizational factors that include work in general, reward system, organizational structure, relationships with colleagues at work and working conditions (2). The second category includes personal factors that include the unity of personal interests and the job itself, length of service, age of the employee and life satisfaction (2).

The purpose of the research was to identify problems based on which it will be possible to implement interventions in order to improve the quality of the working environment in Health center Zagreb-West, while the purpose of the qualitative part was to determine which factors influence employee dissatisfaction.

II. MATERIAL AND METHODS

239 health and non-health workers participated in this cross-sectional survey out of a total of 502 (47.61 %) who at the time of the survey from September 18, 2022. until October 4, 2022. were employed in the Health Center Zagreb-West. The research is divided into survey (quantitative) part and qualitative part. All 239 employees filled out the questionnaire, while 55 employees (10.96%) participated in the qualitative part of the research. All activities of the Health center are included (general/family medicine, pediatrics, dentistry, patronage, radiology, pharmacy, administration, physical medicine, psychiatry, gynecology, occupational and sports medicine, laboratory diagnostics and internal medicine). Data were collected through an anonymous survey questionnaire on

employee satisfaction via the Google Forms online tool, which consisted of 29 questions. After submission, the form was locked and subsequent changes to answers were not possible. The first part of the survey included five general questions related to age, gender, level of education, employment activity and length of service in the Health Center Zagreb-West, and the other 24 questions were related to the topic of the research. Answers to 12 questions were given on a Likert scale (1 - I am not satisfied at all, 2 - I am partially dissatisfied, 3. I am neither satisfied nor dissatisfied, 4 - I am partially satisfied and 5 I am completely satisfied) on) and to 2 with a numerical rating (1 – 5). We did a separate analysis of job satisfaction among the largest group of employees, health professionals working in family medicine, and all other employees. The table shows the results for those activities among which more than 10 employees answered the survey questions (family medicine, dentistry, health visiting practice, administration and physical medicine). After descriptive data processing, the average values between the observed groups were analyzed by Student's t-test in the Statistica v.12.0 program.

III. RESULTS

A total of 27 respondents were male (11.3%), while the rest of the descriptive statistics are presented in table 1. Almost a third of the respondents had completed only high school, 32 (13.4%) had completed a master's degree or postgraduate studies, while only two employees had a PhD. The largest number of employees worked in family medicine (38.5%), followed by dentistry (17.6%). 40.6% of employees worked in the health center for less than 5 years, while 37.7% worked for less than 14 years.

Table 1. Descriptive statistics of research participants.

	FM (n = 92)	Dentistry (n = 42)	Health visiting practice (n = 26)	Administration (n = 19)	PM (n = 18)	ALL* (n = 239)
Sex						
Male	11 11.96%	1 2.38%	0 0.00%	3 15.79%	4 22.22%	27 11.30%
Female	81 88.04%	41 97.62%	26 100.00%	16 84.21%	14 77.78%	212 88.70%
Age (years)						
18 – 30	53 57.61%	17 40.48%	6 23.08%	6 31.58%	2 11.11%	97 40.59%
31 – 40	28 30.43%	16 38.10%	9 34.62%	9 47.37%	7 38.89%	91 38.08%
41 – 50	3 3.26%	5 11.90%	3 11.54%	3 15.79%	6 33.33%	23 9.62%
51 – 60	4 4.35%	2 4.76%	7 26.92%	1 5.26%	3 16.67%	19 7.95%
> 60	4 4.35%	2 4.76%	1 3.85%	0 0.00%	0 0.00%	9 3.77%
Length of service in Health Center Zagreb-West						
< 5	35 38.04%	11 26.19%	1 3.85%	2 10.53%	2 11.11%	58 24.27%
5 – 14	22 23.91%	9 21.43%	8 30.77%	8 42.11%	6 33.33%	65 27.20%
15 – 24	12 13.04%	14 33.33%	9 34.62%	5 26.32%	5 27.78%	54 22.59%
25 – 34	18 19.57%	5 11.90%	6 23.08%	2 10.53%	5 27.78%	49 20.50%
> 35	5 5.43%	3 7.14%	2 7.69%	2 10.53%	0 0.00%	13 5.44%

FM = family medicine; PM = physical medicine; *all activities of the Health Center are included

The largest number of respondents rated their job satisfaction with a rating of 4 (44.4%), while a quarter of respondents each gave a rating of 5 and a rating of 3. Respondents gave similar answers to the question "How do you feel at your workplace?". However, 14.6% were not satisfied with the work organization at all, while 25% and 36% of respondents respectively gave the work organization a rating of 2 and 3. The same results were recorded for work evaluation. A

third of the respondents never received feedback from their superiors about the quality of the work they perform, and the relationship with their superiors was rated 3.45. The efficiency of the administration was rated 2.51, but satisfaction with colleagues at the workplace was really high, with half of the respondents being completely satisfied, and 27% partially satisfied. The result that as many as two thirds of respondents experienced discrimination in the workplace is worrying. In terms of being informed about the situation in the health center, respondents mostly gave a neutral answer, while only 8% were completely satisfied. The average answers to individual questions according to the related activity are shown in table 2. 14% of respondents would immediately accept another job, while 10% would never. The main reasons for changing jobs are: insufficient pay (65%), employer's lack of concern for the needs of workers (46%), generally bad working conditions (26%) and bad interpersonal relations (20%). The largest number of employees would be motivated to work by a higher salary (85%), the possibility of paid education (54%), better work organization (48%) and a quality and considerate service manager (43%). As much as a quarter of the employees had never been to any professional meeting or course during the past year, and almost 87% of the respondents answered that they wanted workshops and professional lectures to be organized in Health Center. The survey was rated positively by three quarters of respondents. As the main means of information, 88% of respondents used the Health center internet, and 75% also learned information orally from colleagues. Employees in family medicine (N=92, 38.49%) rated the following items statistically significantly lower than other employees: job satisfaction (3.41 vs. 3.97), feeling at the workplace (3.24 vs. 3.78), work organization (2.50 vs. 2.93), superior's assessment (3.12 vs. 3.58), utilization and schedule of working hours (2.90 vs. 3.88). Doctors in family medicine were statistically significantly more dissatisfied with their work than other employees (3.41 vs. 3.97; $p < 0.001$), they felt worse at their workplace (3.24 vs. 3.78, $p < 0$ .01) and were significantly more dissatisfied with the organization of work at the Health center (2.50 vs. 2.93; $p < 0.01$). Also, they rated the current relationship with superiors within the service (3.12 vs. 3.58; $p < 0.05$) and satisfaction with the use and distribution of their working time (2.90 vs. 3.88; $p < 0.001$) as worse.). Family medicine doctors were more often discriminated against than other employees of the Health center (2.62 vs. 2.14; $p < 0.01$). There were no significant differences between the results of the answers to the other questions in the conducted survey between family medicine doctors and other employees of the Health center.

Table 2. Mean value of answers to individual questions scored on a Likert scale in the research (1 = I am not satisfied; 5 = I am very satisfied).

	FM (n = 92)	Dentistry (n = 42)	Health visiting practice (n = 26)	Administration (n = 19)	PM (n = 18)	ALL* (n = 239)
1.	3,41	4,14	4,23	3,42	3,83	3,75
2.	3,24	4,07	3,92	3,16	3,83	3,57
3.	2,50	2,50	3,21	3,23	2,32	2,77
4.	2,65	3,10	2,77	2,74	2,67	2,74
5.	2,08	2,20	2,08	2,31	2,46	2,20
6.	3,12	3,12	3,88	3,69	3,00	3,22
7.	2,35	2,67	2,96	2,37	2,39	2,47
8.	4,36	4,40	4,42	3,89	3,72	4,26
9.	1,55	1,31	1,81	2,37	1,78	1,63
10.	2,62	2,10	1,81	1,37	2,72	2,33
11.	2,74	3,31	2,69	2,95	2,72	2,91
12.	2,90	4,19	4,00	3,63	3,39	3,50
13.	2,68	3,17	2,81	2,47	2,94	2,83
14.	3,09	3,14	2,77	3,58	2,83	3,14

FM = family medicine; FPM = physical medicine; *all activities of the Health Center are included

Questions: 1. How satisfied are you with your job?
2. How do you feel at your workplace?
3. How satisfied are you with the organization of work in your institution?
4. How satisfied are you with the evaluation of the work you perform by your superiors?
5. How often have you received feedback from your superiors about the quality of the work you do?
6. How would you rate the current relationship with superiors within the service?
7. How would you rate the effectiveness of the administration of the Health Center in solving problems from your service?
8. How satisfied are you with the relationship with the colleagues you work with at your workplace?
9. Have you ever been discriminated against by colleagues at work for any reason?
10. Have you ever been discriminated against (for any reason) by patients?
11. Do you think that your professional potential is well used in your workplace?
12. How satisfied are you with the utilization and distribution of your working time?
13. How satisfied are you with your information and matters concerning the Health Center?
14. If you were offered a job in another institution similar to your current one, how likely is it that you would accept it?

IV. Discussion

Job satisfaction describes whether employees are satisfied and whether their needs at work are met. It is important that the employee has a positive attitude towards the job, considering that it is followed by motivation and achievement, which contributes to the employee's satisfaction (3). 239 employees participated in the research, of which 27 were male (11.30%), and 212 respondents were female (88.70%). According to data published in the Croatian Health and Statistical Yearbook for 2021, the share of women among employed medical doctors was 63.4%. There is a similar share among Doctor of Dental Medicine, where 67.1% of them are female, while the most numerous professional groups within healthcare is made up of nurses/technicians, among whom only 13.6% are men (4). Almost a third of the respondents had completed high school, which also corresponds to the data published in the Croatian Health and Statistical Yearbook for 2021, where it is stated that the largest share of employed health workers and associates has a secondary level of professional education (4). The employees of the Zagreb-West health center rated their satisfaction with their work as very good (3.75), which is in contrast to research conducted in Lithuania, where salary, social status and workload were among the main factors of dissatisfaction with work in primary health care (5). 14.6% of respondents were not at all satisfied with the work organization, 25% of respondents expressed partial satisfaction, while 36% of respondents were neither satisfied nor dissatisfied. In his research conducted in 2013, Bogdanović states that, among other things, one of the elements that influences the creation of a good organizational climate is good work organization, and that a bad organizational climate can result in inadequate achievement of set goals (6). In this research, more than half of the respondents were satisfied with their relationship with colleagues at the workplace, which is of great importance considering that it is known that a good and supportive relationship with colleagues is an important predictor of job satisfaction, especially if it is about employees who work in teams (7).

In terms of being informed about the situation in the health center, respondents mostly gave a neutral answer, while only 8% were completely satisfied. Research conducted in 1985 shows that the exchange of information in the organization is one of the factors that affects employee satisfaction (8). 65% of respondents cited insufficient salary as the main reason for changing jobs. The World Health Organization has identified low wages as one of the causes of fluctation of health personnel (9). Also, many studies show that low wages are one of the main demotivators for employees in the public sector (10,11). Although one of the ways to develop human potential is education, a quarter of employees have never been to any professional meeting or course during the past year, which could lead to employee demotivation. By carrying out systematic training of employees, their knowledge and skills are improved so that they can perform the tasks that are set before them the best they can. Also, in order for the education to lead to the realization of the goals, certain criteria must be met by the employees, such as behavior, motivation to learn and the application of what has been learned in practice. A systematic literature review published in 2020 identified factors that contribute to job dissatisfaction among primary care physicians in Brazil, which are consistent with the results of our study. Some of the factors of dissatisfaction are the workload caused by the large number of patients and the overload of administrative tasks, which results in a lack of time for examinations and consultations with patients. One of the factors of dissatisfaction is the exposure of healthcare professionals to verbal violence by patients or their family members (12).

The employees of the Health Center Zagreb-West rated their job satisfaction as very good (3.75) with significant differences between the activities, with the worst ratings given by family medicine employees and the administration of the Health Center. Healthcare institutions should develop strategies to achieve the highest possible level of satisfaction of their employees, because such employees are more productive and efficient, and their satisfaction directly affects the quality of the provided healthcare services, their availability and efficiency.

Acknowledgment

None.

References

References are important to the reader; therefore, each citation must be complete and correct. There is no editorial check on references; therefore, an incomplete or wrong reference will be published unless caught by a reviewer and will detract from the authority and value of the paper. References should be readily available publications.

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Preliminary analysis of open data pertaining to the services available through the Health Insurance Institute of Slovenia and provided by family medicine

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***Abstract*— BACKGROUND:** The Health Insurance Institute of Slovenia (ZZZS) began publishing service-related data in May 2023, following a directive from the Ministry of Health (MoH). The ZZZS website provides easily accessible information about the services provided by individual doctors, including their names. The user is provided relevant information about the doctor's employer, including whether it is a public or private institution. The data provided is useful for studying the public system's operations and identifying any errors or anomalies. **METHODS:** The data for services provided in May 2023 was downloaded and analysed. The published data were cross-referenced using the provider's RIZDDZ number with the daily updated data on ambulatory workload from June 9, 2023, published by ZZZS. The data mentioned earlier were found to be inaccurate and were improved using alerts from the zdravniki.sledilnik.org portal. Therefore, they currently provide an accurate representation of the current situation. The total number of services provided by each provider in a given month was determined by adding up the individual services and then assigning them to the corresponding provider. **RESULTS:** A pivot table was created to identify 307 unique operators, with 15 operators not appearing in both lists. There are 66 public providers, which make up about 72% of the contractual programme in the public system. There are 241 private providers, accounting for about 28% of the contractual programme. In May 2023, public providers accounted for 69% (n=646,236) of services in the family medicine system, while private providers contributed 31% (n=291,660). The total number of services provided by public and private providers was 937,896. Three linear correlations were analysed. The initial analysis of the entire sample yielded a R-squared value of .998 and p-value <0.001. The second analysis of the data from private institutions showed a R-Squared value of 0.600 +, with a $p < 0.001$. The third analysis used data from public providers and showed a strong level of explanatory power, with a R Squared value of 0.961 with a p-value <0.001. **CONCLUSION:** Our analysis shows a strong linear correlation between contract size of the program signed and number services rendered by family medicine providers. A stronger linear correlation is observed among providers in the public system compared to those in the private system. Our study found that private providers generally offer more services than public providers. However, it is important to acknowledge that the evaluation framework for assessing services may have inherent flaws when examining the data. Prescribing a prescription and resuscitating a patient are both assigned a rating of one service. It is crucial to closely monitor trends and identify comparable databases for pairing at the secondary and tertiary levels.

***Index Terms*: Workload, Family Practice, Slovenia, Primary Health Care, Delivery of Health Care**

I. INTRODUCTION

Healthcare systems possess a substantial volume of data that is important for their day-to-day functioning [1]. The publication and re-use of these data have been infrequent. Slovenia has recently embraced the concept of open data, seeing its value and potential. As a result, the country has started the process of releasing its previously inaccessible data to the public, therefore revitalising it and making it available to interested parties [2]. It is imperative that published data adhere to the FAIR data principles, which include the qualities of being Findable, Accessible, Interoperable, and Reusable [3].

In accordance with a mandate from the Ministry of Health (MoH) [4], the Health Insurance Institute of Slovenia (ZZZS) commenced the publication of data pertaining to primary care services in May 2023. The ZZZS website offers readily available information, in a computer-readable format, regarding the services provided by individual doctors. This information includes their names, provider numbers, the institutions they are affiliated with, whether these institutions are publicly or privately owned, and the number of services they provide on a daily basis [5].

The data presented in this research has significance in examining the operations of the public system and finding potential avenues for enhancing the precision of the collected data. As it has been proven with the data on primary care physicians who accept new patients and those who have reached their quotas [2].

The objective of this research was to analyse the first dataset disclosed on the services provided and establish connections

with the pre-existing publicly available data. Our objective

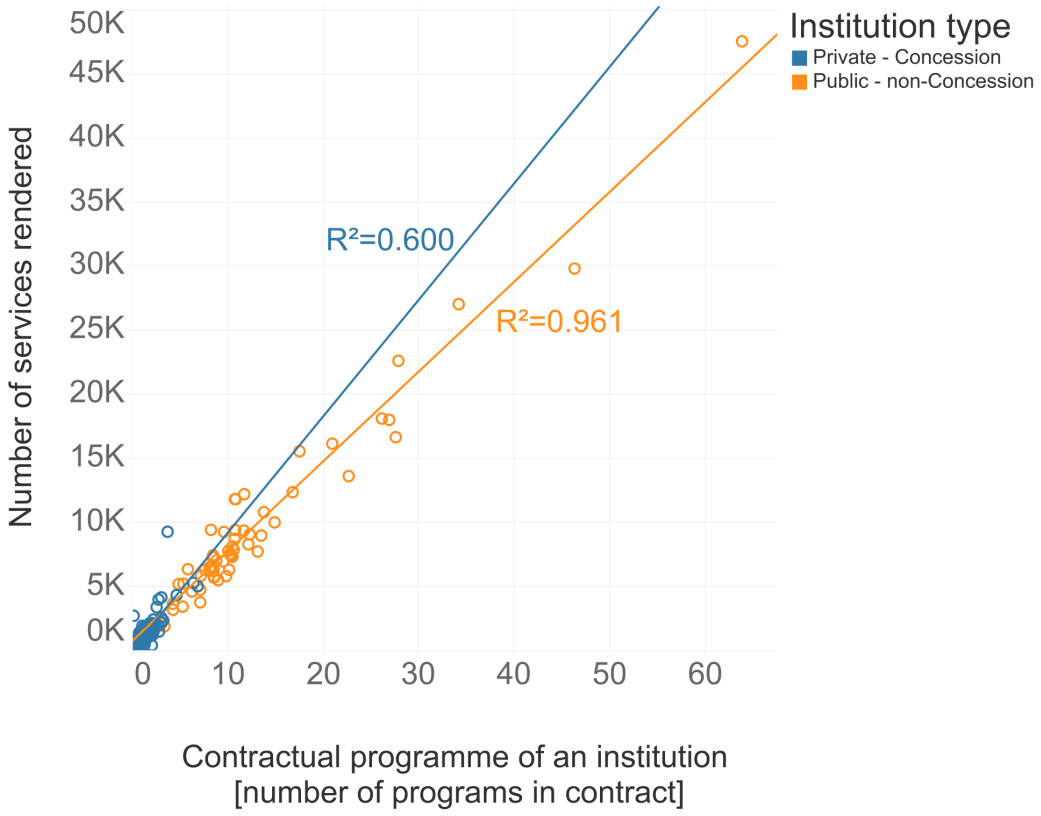

FIGURE 1. CORRELATION BETWEEN NUMBER OF SERVICES RENDERED AND CONTRACTUAL PROGRAMME OF AN INSTITUTION.

was to ascertain if there are any patterns that can be found in the newly published data set that would allow us to deduce the quality of the dataset and compare or differentiate private and public institutions. This is especially important for improvement of newly opened data sets that have not yet undergone public scrutiny.Material and Methods

The data for services rendered in May 2023 was downloaded and used in analysis [6]. The published data on services rendered were cross-referenced using the provider's RIZDDZ number with the daily updated data on ambulatory workload from June 9, 2023, published by ZZZS. The total number of services provided by each provider in a given month was determined by adding up the individual services and then assigning them to the corresponding provider. The correlation was calculated using Tableau version 2023.1. R-squared value gives indicates how much of the variation of a dependent variable is explained by an independent variable in a regression model. All of our correlations compared how much does the contractual programme of an institution predict the number of services rendered.

II. Results

A pivot table was created to identify 307 unique institutions, with 15 institutions not appearing in both lists. There are 66 public institutions, which make up about 72 % of the contractual programme in the public system. There are 241 private institutions, accounting for about 28 % of the contractual programme. In May 2023, public providers accounted for 69 % (n=646,236) of services rendered in the family medicine system, while private providers contributed 31 % (n=291,660). The total number of services rendered by public and private providers was 937,896. Three linear correlations were analysed, first one being the combined data set without the subgroups. The second and third correlations (Figure 1) compare two different institution types. The initial analysis of the entire sample yielded a R-squared value of .998 and a $p<0.001$. The second analysis of the data from private providers showed a R-Squared value of .600, indicating a strong correlation between the variables with $p<0.001$, providing additional support for the statistical significance of the results. The third analysis used data from public institutions and showed a R-Squared value of 0.961 with a p-value < 0.001.

III. Discussion

The objective of this research was to assess recently opened data on the services rendered by primary care doctors and provide a novel perspective on the publicly available data [6]. The utility of this approach has been shown on another open data set, theprimary health physician capacity data [2]. This analysis not only revealed significant discrepancies in the official data and real world state, but also presented the findings in a manner that prioritises the needs and experiences of patients. This hasled to an increased level of public scrutiny and has played a significant role in driving the necessary enhancements to the data and improving the primary source [7].

The use of open data in the future has the potential to generate significant value by leveraging existing data resources [8]. The European Commission is actively engaged in the pursuit of increasing the availability of government-generated data via online publication, in accordance with the current Directive on open data and the re-use of public sector information [8]. Slovenia has developed a website, known as OPSI, which serves as a platform for the uploading and sharing of open data with its residents [9]. The existing challenge, in facilitating data accessibility across numerous organisations and ministries, lies in the absence of a centralised repository for metadata of these datasets. The current situation is resulting in increased difficulty in the user's experience of collecting and using this data, albeit it is not rendering it completely unattainable. For instance, ZZZS opts not to use OPSI as a platform for disseminating their data; instead, they choose to publish the data independently on their own web page. The data pertaining to the public system used in this research were obtained only from the ZZZS site, which serves as a comprehensive source for health system-related data. In the future we expect consolidation or a global list of all the data provided by public institutions leading to the local repositories, a necessary step towards good open data accesibility and findability.

The findings of our study indicate a significant positive linear relationship between the contract size of the programme and the number of services rendered by family medicine providers. A nelegibly stronger linear correlation is observed among providers in the public system compared to those in the private system. This phenomenon may be attributed to the higher concentration of physicians at public institutions, resulting in a larger patient load and a more balanced distribution of patients among these facilities. Contrastly, private providers sometimes have a lower physician-to-institution ratio, with some privately owned institutions employing only one doctor.

The findings of our research indicate that private providers tend to provide a more services compared to their governmental counterparts. Nevertheless, it is crucial to recognise that the assessment framework used to evaluate services may possess inherent deficiencies when scrutinising the data. Both the act of prescribing a medication and the act of resuscitating a patient are classified as services with a rating of one. The current depiction of the work performed lacks realism and should be revised in order to accurately reflect the actual workload. The omission of detailed explanations on the methodology used for measuring the data and the diverse scope included by the concept of "1 unit of service" might result in a significant risk of misinterpretation when being communicated to the general public and the development of negative public attitudes [10].

It is crucial to closely monitor trends and identify comparable databases for pairing at the secondary and tertiary levels as well. This could offer a good public framework to monitor the efficacy of forthcoming measures aimed at addressing the issue of limited access to primary healthcare [11].

Acknowledgment

The authors express their sincere gratitude for the support provided by Sava Med d.o.o. in supporting this study, as well as the valuable insights provided by Znanstveno društvo Sledilnik about health-related open data in Slovenia. We would also want to express our gratitude to the ZZZS for their publication of this data and their assistance in facilitating our comprehension of the first dataset release.

Data availibility

The data-set used in this manuscript is availible online [6].

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PROCEEDINGS

Posters

General Medicine Research Network – Creation of a Framework for the Setup of a General Medicine Research Network in Upper Austria

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Abstract — **As an independent discipline, general medicine has a comprehensible need for independent research that takes into account the epidemiological and methodological specificities of primary care. However, despite the need for comprehensive research, a common problem encountered is the lack of research infrastructure that adequately facilitates such research. With this project we want to close this gap, which is why we conducted several expert interviews with relevant stakeholders on their expectations and recommendations regarding the setup of such a network. Based on the insights gathered, we derived the "Research Network Framework" that consists of core processes and enabling functions and allows to implement and operate such a network as smoothly as possible. Each element of the framework is presented in terms of content and its application is outlined on the example of the project "General Medicine Research Network Upper Austria". By applying the framework to our own project, we were able to quickly build up our network with numerous general practitioners and launch a first project with extensive data collection.**

Index Terms – **General Medicine, General Practice, Primary Care, Research Infrastructure, Research Network**

I. Introduction

As an independent discipline, general medicine has a comprehensible need for independent research that takes into account the epidemiological and methodological specificities of primary care. Only in the primary care setting can studies be conducted that include multimorbid patients and nursing home residents, consider low-prevalence decisions, and test the effectiveness of new interventions in everyday life. General medical research is therefore essential for the advancement of the discipline and thus for the continuous improvement of general medical care.

However, despite the need for comprehensive research in general medicine outlined above, a common problem encountered is the lack of research infrastructure that adequately facilitates such research. Furthermore, there is a lack of concrete procedural models that outline the establishment of such a research infrastructure and enable it to be carried out as efficiently as possible. With this project we want to close this gap and develop a framework which enables the development of a research network based on the requirements and recommendations of the relevant stakeholders and outline its application on the example of the "General Medicine Research Network Upper Austria".

Based on the preceding considerations the following research questions can be derived:

- What are the expectations and requirements of general practitioners regarding the development of a research network?
- What requirements and recommendations from other disciplines need to be considered?
- What are the main elements of a framework for the setup of a research network in the field of general medicine that need to be identified and worked on?
- What tools and processes need to be established to achieve the most efficient workflow and collaboration within the network?
- What kind of enabling functions are needed for the successful implementation and operation of such a network?

II. Material and Methods

In consideration of the need for research infrastructure on the one hand and the lack of a standardized framework for the implementation on the other hand, we conducted several non-standardized, open interviews with various stakeholders who, in our view, are crucial for the successful implementation of a research network in the field of general medicine in general and for our specific project "General Medicine Research Network Upper Austria" in particular. In the first part of interviews, we asked the general practitioners who planned to participate in the network about their expectations, requirements, and recommendations in setting up the network. In the second part of interviews, we held discussions with IT experts, legal advisors, potential funders and sponsors of the project, as well as stakeholders from the JKU Linz and the planned team of organizers and research coordinators of the Institute of General Practice. By doing so, we hoped to address overarching topics for the development of a sustainable network structure.

III. RESULTS

In this section, we will briefly present the results of the expert interviews conducted and the framework derived from these findings, as well as its application on the example of the "General Medicine Research Network Upper Austria".

Interview findings

In a previous study of the Institute of General Practice of the JKU, 650 general practitioners were asked about their attitude towards research by means of a questionnaire. There it was shown that more than a quarter of the general practitioners (105 out of 416 GPs who answered) expressed their willingness to contribute to research. This impression also emerged during our interviews where we tried to elicit the general practitioners' expectations and recommendations regarding a potential network in more detail. Examples of motivation to participate in the research network included gaining evidence with practical relevance and feedback on the general practitioners' own work. Among others, good communication within the network, minimal disruption of practice operations, timely feedback of research results, and involvement in the planning of research projects were mentioned as prerequisites for a functioning network.

The second part of interviews was held with various experts from different disciplines, which we hoped would provide insights into the prerequisites and recommendations regarding the development of the network. Within the prospective administrative team of the Institute of General Practice, the desire for clear responsibilities as well as clear processes within the research projects was expressed above all. Furthermore, the establishment of a common platform as a workflow and collaboration tool was mentioned as important by both the general practitioners and the institute staff. The technical feasibility of such a platform was confirmed by our IT expert, however, the processing and storage of the collected data were identified as the main issues to be clarified. In accordance with that, the legal advisor interviewed also highlighted the importance of compliance with existing data protection guidelines and the associated careful preparation of the required data, for example the anonymization of patient data. This issue was also addressed several times by the general practitioners interviewed. Regarding the cooperation between the Institute and the participating general practitioners the development of memoranda of understanding with the rights and obligations of both parties was further recommended as prerequisite.

Form findings to framework to application

Based on the findings from the interviews presented above, we created the "Research Network Framework" which is divided into two main parts, i.e. research core processes and enabling or supporting functions (see Figure 1).

Research core processes. The core processes include all elements of a comprehensive research project, ranging from general research planning, the development of a specific research objective, the choice of a suitable survey method, data collection, processing and analysis, to the interpretation and presentation of the research results and their dissemination to the participating general practitioners. In this sense, the individual steps do not differ greatly from other research projects, but the number of stakeholders and research projects, as well as the legal, technical and operational factors to be taken into account, impose additional complexity. In this sense, especially the general practitioners emphasized the need for clear, well documented and communicated processes as a key to ensure efficient workflows and minimal disruption of everyday practice operations.

Enabling functions. In contrast to the core processes, the enabling functions cover the overarching topics such as governance and coordination, finance/funding, legal issues as well as systems and infrastructure and therefore serve to operate the network and its core processes as smoothly as possible.

The results of our interviews indicate that for general practitioners, good organization and communication within the network and minimal disruption of practice operations are of eminent importance. For this reason, the enabling function "Governance and Coordination" was created. In the example of our project "General Medicine Research Network Upper Austria", the Institute of General Practice of the JKU is responsible for the organization of the network, the administration of systems and infrastructure, the planning and coordination of research projects and the planning and organization of joint exchanges between the parties involved in the network.

The next enabling function is called "Systems and Infrastructure" and deals with all issues related to a common workflow and collaboration platform which was cited as a key element by several parties. Concerning our project "General Medicine Research Network Upper Austria", we are currently in the process of developing this platform that allows the participating general practitioners to inform themselves about planned and ongoing research projects, the required data and further parameters. Moreover, completed projects and their results and recommendations for implementation in the practical setting can be viewed. The platform will also offer the opportunity to briefly present one's own research ideas which motivates general practitioners to question their own interests and challenges in their daily work and further accommodates the general practitioners' desire for early involvement in the planning of future project ideas.

Two further enabling functions of the framework are called "Finance/Funding" and "Legal issues" and comprise securing funding of the network as well as forming a legal basis for the collaboration between the parties involved. With regard to the financing of the network, it became apparent that sufficient financial resources must be available for setting up the platform or compensating the general practitioners. For this reason, the JKU Linz granted a budget of 100,000 euros over a period of 5 years. In addition, the Austrian Health Insurance Fund is supporting the project with a grant of 15,000 euros for the research coordination. From a legal point of view, the cooperation of the Institute of General Practice and the participating general practitioners within the "General Medicine Research Network Upper Austria" will be governed by memoranda of understanding which have been recommended and prepared by the legal department of the JKU Linz. In addition, all questions regarding data protection and

compliance to existing guidelines are also addressed in this function.

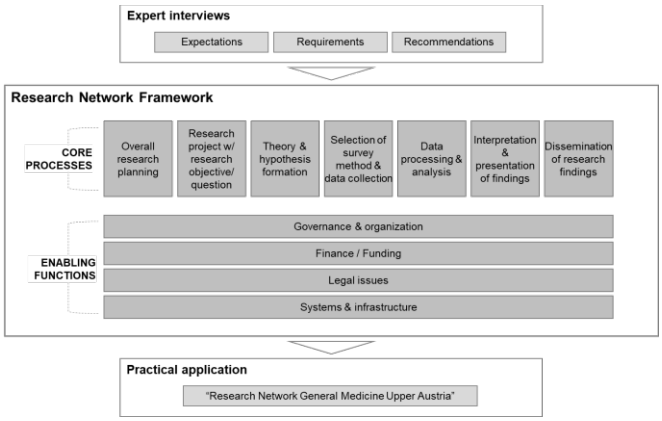

Figure 1. Research Network Framework

IV. DISCUSSION

As demonstrated above, the need for general medical research is urgent. However, the lack of appropriate research infrastructure is evident throughout. Furthermore, there is a lack of concrete frameworks in literature and practice on how to successfully implement such a network efficiently. With this project we wanted to close this gap and developed a framework which enables the setup of a research network based on the requirements and recommendations of relevant stakeholders. The application of our framework on the example of the project "General Medicine Research Network Upper Austria" shows the significance and positive effects of a standardized and structured approach. To date, 20 general practitioners could already be recruited for the research network and a first research project with more than 800 collected data sets could be conducted. For the coming years, we plan to expand the network to the whole of Upper Austria.

A multidisciplinary approach to the early detection and treatment of multiple myeloma

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Abstract-**Multiple myeloma is a malignant disease characterized by an uncontrolled accumulation of clonal plasma cells in the bone marrow, a high concentration of monoclonal immunoglobulins in the serum or urine, and lytic bone lesions. Multiple myeloma occurs with a frequency of 3 cases per 100,000 inhabitants and represents 2- 3% of all malignant diseases and about 15% of all hematological malignancies. Early recognition by family physicians of symptoms suggestive of multiple myeloma and an interdisciplinary approach between family physicians, and hematologists is very significant in early initiation of multiple myeloma treatment. METHODS: The medical documentation of a patient was analyzed, showing the role of the family doctor in early recognition of the symptoms of multiple myeloma, but also the importance of cooperation with the hematologist for a better outcome and early treatment of the patient. RESULTS: A 77-year-old married father of one son comes to the examination with enlarged neck lymph nodes, sore throat and headache. Pharynx hyperemic without purulent patches on the tonsils with swelling of the neck lymph nodes on both sides. Pulmonary vesicular breathing without accompanying sounds. The patient is referred for laboratory tests, a pcr test for covid and a throat swab. Leukocytosis (15,000) and elevated sedimentation and isolated S.aureus from the throat were detected. At the control examination on the seventh day, the patient no longer feels pain in the throat or difficulty swallowing, it was agreed to do a control laboratory, but the patient did not do it. One month later, he comes to the examination because of pain in the spine that lasts for almost 10 days and spreads to the leg, but malaise and pronounced weakness have appeared in the last days. The patient is referred for an X-ray of the LS rbet as well as laboratory analyzes Due to leukopenia, anemia and the presence of general weakness and pain in the spine, the patient was referred to the Hematology Clinic for further investigation and treatment. CONCLUSION: Multiple myeloma is an insidious disease and therefore needs a good history examination and early diagnosis and treatment that would lead to a better outcome for the patient.**

Key worlds: family doctor, myeloma, hematologist

Introduction

Multiple myeloma is a cancer that forms in a type of white blood cell called a plasma cell. Healthy plasma cells help fight infections by making proteins called antibodies.

Antibodies find and attack germs. [1]In multiple myeloma, cancerous plasma cells build up in bone marrow. The bone marrow is the soft matter inside bones where blood cells are made. In the bone marrow, the cancer cells crowd out healthy blood cells. Rather than make helpful antibodies, the cancer cells make proteins that don't work right. This leads to complications of multiple myeloma. [1]

People with multiple myeloma may experience a number of different symptoms and signs. For people with myeloma who have no symptoms, their cancer may be discovered by a blood or urine test that is performed for a different reason, such as for an annual physical exam. [2]

The term “CRAB” is to describe the most common signs of multiple myeloma. This acronym stands for calcium levels (C), renal failure R), anemia (A) and bone pain. (B)[3]

Myeloma may weaken and degrade bones, leading to calcium entering the bloodstream (a condition known as hypercalcemia). This condition may lead to symptoms including nausea, thirst, reduced appetite, confusion or constipation. [4]Renal failure describes lack of function in the kidneys. Because myeloma cells release high levels of proteins, kidney damage may result. [4] If myeloma cells come into contact with healthy bone marrow (where blood cells develop), the body may not make enough red blood cells, leading to anemia. Anemia may cause fatigue, weakness, fast heartbeat, shortness of breath and other symptoms. [3] Because myeloma may damage the bones, pain may result, particularly in the spine and ribs. [4]Symptoms of myeloma may be similar to many other conditions. This can make it difficult to diagnose. Because of this, several tests are required. These may include: urine test, blood test, x-rays, bone marrow biopsy. After MM is confirmed, additional tests are used to check for the presence of impaired kidney function, anemia, thickening of the blood, and other complications of multiple myeloma.[5]Blood and urine tests for monoclonal protein — An abnormal protein produced by the plasma cells, called a monoclonal (M) protein (sometimes called a "paraprotein"), can be found in the blood or urine of almost all patients with MM, which helps establish the diagnosis. M proteins serve no useful function, and may be responsible for increases in the thickness of the blood, kidney damage, or bleeding problems.[5] In some patients, "free light chains" (FLCs), which represent a small portion of the paraprotein, are secreted either in addition to the M protein or by itself. These can be measured by an assay called the free light chain assay.[5] The assay measures the two types of free light chains, kappa and lambda, which are made by plasma cells, and provides a ratio of the two.[5]However, it is important to remember that not everyone with a monoclonal protein has MM. The diagnosis also requires one or more abnormalities

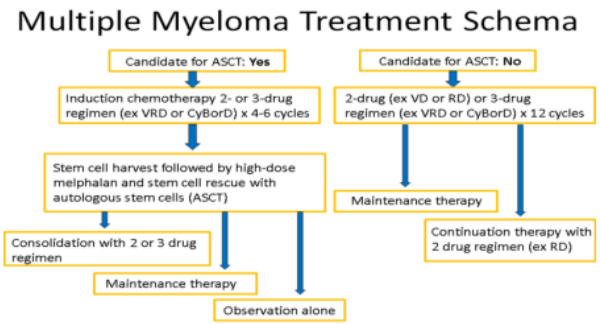
such as anemia, bone lesions, kidney failure, and high calcium levels in the blood. In most individuals with MM, a bone marrow aspiration and biopsy shows that plasma cells comprise an abnormally high percentage of bone marrow cells (more than 10 percent).

It may be necessary to collect samples from different areas because MM can affect the marrow of some bones but not others. [5]Specialized tests performed on the bone marrow sample may reveal genetic or chromosomal abnormalities of the plasma cells in people with MM. The results of these tests are helpful for predicting the response to treatment and survival. About 80 percent of patients with MM have bone changes on imaging at the time of diagnosis. [5] These can include distinct, round (lytic) areas of bone erosion; generalized thinning of the bones; and/or fractures. [5]The bones most commonly involved are the vertebrae, the ribs, the pelvic bones, and the bones of the thigh and upper arm. [5] Imaging tests are done at the time of diagnosis to look for bone changes.

This may include low-dose whole body computed tomography (CT), combined positron emission tomography (PET)/CT, or magnetic resonance imaging (MRI). [5]

The diagnosis of MM requires the following:[5] 1.A bone marrow aspirate or biopsy showing that at least 10 percent of the cells are plasma cells or the presence of a plasma cell tumor (called a plasmacytoma), plus at least one of the following two features. 2. Evidence of damage to the body as a result of the plasma cell growth, such as severe bone damage, kidney failure, anemia, or high calcium in the blood, and/or 3. Detection of one of the following findings: ≥60 percent plasma cells in the bone marrow; serum free light chain ratio of 100 or more (provided involved FLC level is at least 100 mg/L); or MRI showing more than one lesion (involving bone or bone marrow). Multiple myeloma treatment isn't always needed right away. If the multiple myeloma is slow growing and isn't causing symptoms, close watching might be the first step. For people with multiple myeloma who need treatment, there are a number of ways to help control the disease.(1) Standard treatment is induction chemotherapy with a combination of a proteasome inhibitor (e.g.,bortezomib or carfilzomib), immunomodulatory agent (e.g., thalidomide, lenalidomide, or pomalidomide), and glucocorticosteroid (dexamethasone). The most common initial therapy choices are bortezomib + lenalidomide + dexamethasone or cyclophosphamide + bortezomib + dexamethasone. [6]Induction therapy is given 4-6 cycles followed by autologous hematopoietic cell transplantation. [6]Thereafter, many patients receive post-transplant therapy (also called consolidation or maintenance therapy). In patients not eligible for autologous hematopoietic cell transplantation, a prolonged course of initial chemotherapy with a doublet (bortezomib + dexamethasone or lenalidomide + dexamethasone) or triplet (bortezomib + lenalidomide + dexamethasone or cyclophosphamide + bortezomib + dexamethasone) is typically administered (Figure 1). [6]

Figure 1



Material and Methods

The medical documentation of a patient was analyzed, showing the role of the family doctor in early recognition of the symptoms of multiple myeloma, but also the importance of cooperation with the hematologist for a better outcome and early treatment of the patient.

I RESULTS

Case report: A 77-year-old married father of one son comes to the examination with enlarged neck lymph nodes, sore throat and headache. Pharynx hyperemic without purulent patches on the tonsils with swelling of the neck lymph nodes on both sides. Pulmonary vesicular breathing without accompanying sounds. The patient is referred for laboratory tests, a pcr test for covid and a throat swab. Leukocytosis (15,000) and elevated sedimentation and isolated S.Aureus from the throat were detected. It was prescribe antibiotic for 7 days. At the control examination on the seventh day, the patient no longer feels pain in the throat or difficulty swallowing, it was agreed to do a control laboratory, but the patient did not do it. One month later, he comes to the examination because of pain in the spine that lasts for almost 10 days and spreads to the leg, but malaise and pronounced weakness have appeared in the last days. The patient is referred for an X-ray of the LS rbet as well as laboratory analyzes.

X-ray show Disc herniation at L4-L5 and L5-S1, with dorsal reduction of disc spaces and bridged osteophytes Spondylolisthesis of the facet joints at the L2-L3 level Kyphosis deviation in the thoracolumbar part of the spine, with a bridged osteophyte. Laboratory test shows: Le 2.2, Hb 97 G/L SE 64 ER 2.79 *10 Crea 173.64 umol/L. Due to leukopenia, anemia and the presence of general weakness and pain in the spine, the patient was referred to the Hematology Clinic for further investigation and treatment. In the hematology clinic investigation was done. The results are as follow a bone marrow puncture proved the presence of more than 10% of plasma cells.

Laboratory analyzes with a low level of erythrocytes and leukocytes and with elevated calcium and with elevated sedimentation as well as elevated degradation products. Electrophoresis with the presence of monoclonal proteins. A diagnosis of Multiple Myeloma was made. Open history in a day hospital for further treatment.

II . Discussion

Various case reports have been made of myeloma patients worldwide. Something that can be noticed is that fatigue and general weakness dominate in all cases, while the rest of the symptoms are individual. It is precisely because of the general symptoms that patients with multiple myeloma are detected very late, and therefore the outcome of treatment is fatal in the majority of cases. Multiple myeloma is an insidious disease and therefore needs a good history examination and early diagnosis and treatment that would lead to a better outcome for the patient.

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Online and Face-to-Face Learning model – our experience from TRANSSIMED Project

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***Abstract*— Background: The COVID-19 pandemic has changed several segments of human life and it has also changed the face of education. Both traditional and online medium of education have their pros and cons. Many universities and academic institutions have adopted and continue to practice hybrid model of education even COVID-19 pandemic has finished. TRANSIMED project, as part of the ERASMUS+ programs has the main objective to establish a competency-based, sustainable system of simulation-based vocational training in primary health care in three countries (Slovenia, Croatia and N. Macedonia). To achieve the main objectives of the Project, combination model of learning – online and face to face was used by the main leader of the project-SIM Centre-Community Health Centre Ljubljana. Two groups of instructors, basic and advanced, from the partner countries had finished this training. Aim: to investigate instructor's opinions regarding hybrid model of education: online and face-to-face. Method: More than 20 modules were implemented for both levels of instructors. Most of them were processed on line, but some of them were realized as a part of the trainings in the SIM Centre together with the practical part that included working in a group with high fidelity mannequins according to pre-developed scenarios. The education took place over the course of 15 days, of which 9 days were online and 6 days were realized in SIM Centre in Ljubljana for advance instructors and 6 on line and 5 days face to face education for basic instructors. After completing the training, instructors continue to work at national level developing culturally adapted educational programs for education with simulation for medical teams in primary health care level and establishing a sustainable system of education with simulations to improve patient safety, which is the main goal of the project TRANSSIMED. Results: Feedback received from 9 instructors that finished hybrid education. With on line education, there was no need for longer absence from work, which was of great importance for the instructors who works as family doctors. The space flexibility followed by familiarity with digital technology, working in a small group with constant interaction, excellent access to materials on an on-line platform, respecting a time frame and a planned time for completing tasks were also very significant benefits of this education. At the end of each day, evaluation of knowledge with a test was organized. While negative opinions regard technical problems, the long working day, less time for the family and for rest. Perceived benefits of face-to-face education include close contact with teachers, socialization, and interactions, as well as participant's active participation, while the major perceived disadvantage was the material cost. Positive perceptions about hybrid education are often linked to combining the benefits of face-to-face and online education. Conclusion: Considering the length of training, our experience was positive and this hybrid model provided more benefits and highlights both face-to-face and online education for future education.**

***Index Terms*-- face-to-face education, online education, hybrid education, opinions.**

I. INTRODUCTION

The COVID-19 pandemic has changed several segments of human life and it has also changed the face of education. Both traditional and online medium of education have their pros and cons. Students are more aware of self-efficacy, self-awareness, self-paced learning, creating a flexible learning environment, and allowing for an interactive and safe way to learn digitally when reflecting upon hybrid and blended learning. Another strength that should be emphasized is how hybrid and blended learning may increase accessibility for those with physical and mental disabilities, in addition to those who are audibly impaired. Incorporating storytelling with hybrid and blended learning will enhance not only the relationship between the educator and learner by creating a more interactive environment, but will also increase the student knowledge and retention of the content.

Depending upon the professor delivering the content and the student absorbing the content, hybrid and blended learning can pose a potential weakness within an online learning experience. This can also allow for all parties involved becoming complacent if the online course is not fully structured or interactive. When teaching in an online environment another potential weakness is there is no way of gauging body language with students. Hybrid and blended learning certainly has its fair share of potential challenges such as: technology could be compromised, computer compatibility, individual learners integrity may be questionable, adjusting from the traditional classroom to an online learning landscape, online software options are costly, and so forth.[1]

In pandemic conditions, it started with the implementation of online education at all levels of the education system as a unique and applicable way of education, and the duration of the pandemic situation made it possible to choose both the good and the less good aspects of this type of education. In diverse

medical education contexts, e-learning appears to be at least as effective as traditional instructor-led methods such as lectures. Students do not see e-learning as replacing traditional instructor-led training but as a complement to it, forming part of a blended-learning strategy[2]. But in adults, this model of learning has found a suitable application, even in medical education. Many Universities and academic institutions have adopted and continue to practice hybrid model of education even COVID-19 pandemic has finished. Blended learning is a new approach to improving the quality of medical education. Acceptance of blended learning plays an important role in its effective implementation. [3] TRANSIMED project, as part of the ERASMUS+ programs has the main objective to establish a competency-based, sustainable system of simulation-based vocational training in primary health care in three countries (Slovenia, Croatia and N. Macedonia). To achieve the main objectives of the Project, combination model of e-learning – online and face to face was used by the main leader of the project- SIM Centre-Community Health Centre Ljubljana.

II. Material and Methods

In order to obtain objective feedback on the achieved hybrid education, an online survey was conducted with a questionnaire that covered: demographic characteristics, previous experience with online education, experience with hybrid education, advantages and disadvantages of online and hybrid education and a opened question about their opinion for the role of hybrid model in medical education. The questionnaire was filled out by all 9 participants who completed training through a hybrid model for project TRANSSIMED, in the period from March-June 2023.

III. Results

Feedback was received from all instructors aged 34 to 54 years (6 women and 3 men), all specialists in family medicine with work experience between 9 and 21 years as a family doctor was more than positive, ranking 5 from 0 to 5 *(Table I).* All of them have previously experience with on line education and 6 of them were involved in online education as educators at our faculty. Instructors believe that the hybrid education is suitable for learning theoretical knowledge (100%), communication and practical skills (78%), improving performance (89%), but it should be considered whether to use it as a complex model for case report (55%). Main advantages are saving funds, and effective learning of clinical skills with physical presence followed with time saving, possible preliminary preparation, interactivity and faster adaptation in the education process. As main disadvantages was mentioned poor technical performance of education and inadequate interaction with educator during online education.

Table I. Opinion of the instructors from N.Macedonia on hybrid education of TRANSSIMED project

Question	Preferences	n (%)
Do you think hybrid education is suitable for (choose multiple answers)	- Learning theory	9 (100%)
	- Learning practical skills	7 (78%)
	- Learning communication skills	7 (78%)
	- Case report	5 (55%)
	- Performance	8 (89%)
Please choose which of the following do you think are advantages of the hybrid education model	- Time saving	7 (78%)
	- Saving funds	9 (100%)
	- Education tailored to the participant	5 (55%)
	- Possibility of preliminary preparation	7 (78%)
	- Greater availability of materials and other resources	6 (67%)
	- Determination of knowledge through testing and evaluation	7 (78%)
	- Interactivity	7 (78%)
	- Learning clinical skills with physical presence	8 (89%)
	- Possibility of faster adaptation in the education process	7 (78%)
Please state which of the following do you think are disadvantages of the hybrid learning model?	- Insufficient time to learn the material	0 (0%)
	- Poor technical performance of education	5 (55%)
	- Inadequate interaction with the educator and the participants	4 (44%)
	- Inappropriate modules	3 (33%)
	- Inadequate assessment	3 (33%)
Please, from 1 to 5, express your satisfaction with the hybrid education method in the TRANSSIMED project	All 9 instructors rated the education in TRANSSIMED with the highest rating-5	9 (100%)

IV. Discussion

As part of the TRANSSIMED project, in the period March-June 2023, 9 instructors - 5 advance and 4 basic, attended hybrid education model for acquiring competencies through the simulation method. 27 modules were implemented for advanced instructors, and 14 for Basic. Most of them were processed on line, but some of them were realized as a part of the trainings in the SIM Centre in Ljubljana together with the practical part that included working in a group with high fidelity mannequins according to pre-developed scenarios. The

education took place over the course of 15 days, of which 9 days were online and 6 days were realized in SIM Centre in Ljubljana for advance instructors and 6 on line and 5 days face to face education for basic instructors.

Online education is mostly reserved for the theoretical part of education, which implies concise interactive lectures that ended with an assessment. The next day, the lecture started with an evaluation of what was learned from the previous day and a comment on the homework. The participants themselves gave feedback on what they had done and learned, and the facilitators gave directions to the module itself through an intensive interactive discussion. For the next day, the contents that will be processed as well as the materials that could be searched for an easier and better mastering of the education were announced. On-line games were also used in which the teams shared their thoughts and upgraded their knowledge.

Most of this face-to-face education was aimed at mastering practical skills in a simulation center but also for repeating some highlights or upgrading for the next module. On a highly realistic mannequin, through the simulation on an already prepared scenario for saving a life-threatening patient, the instructors were educated by practicing debriefing and feedback. Non-technical skills training in healthcare frequently uses high-fidelity simulation followed by a facilitated discussion known as debriefing. [4]

This hybrid model of education with simulation was a unique experience for the instructors from Macedonia who for the first time had the opportunity to be educated in a SIM center for primary health care teams. They have long working experience as family doctors and are the patient's first contact with the health system even when it comes to managing emergency situations. These situations require updated knowledge, communication skills, trained staff and adequate equipment and organization, so therefore the need for such a specific education in the SIM Center was recognized. [5]

The TRANSSIMED project, under the Erasmus + program, enabled excellent education of instructors through modules implemented with a hybrid model of education.

With the first part of the hybrid model, which included online education, several positive aspects stand out, such as less absenteeism from work, which was of great importance for the instructors who works as family doctors. The space flexibility followed by commotion in pursuing education is also mentioned as positive benefits. Inadequate handling of technique as well as lack of emotions in education are singled out as shortcomings of the highest rank, but the need for equipment and inadequate handling of technique as well as lack of interaction are also perceived. Similar strengths were detected in the Singh's study. [1]

The greatest advantage of the hybrid model of education is the saving of funds followed by the faster adaptation in the educational process and the possibility of prior preparation as well as the practice of practical skills with predetermined knowledge and verification through testing. The possibility of interaction, saving time and the possibility to adapt education to the measure of the participants stand out as an advantage. From a disadvantage perspective, possible poor technical performance, inadequate interaction between the educator and the group, inadequate modules and inadequate testing stand out. Nikolopoulou also find positive perceptions of the Greek students about hybrid education which are often linked to combining the benefits of face-to-face and online education. Students' preferences for their future education highlight both face-to-face and hybrid education.[6]

Regarding the possibility of using the hybrid model in medical education, several answers were given in favor of a more economical education that saves time and resources, in one-on-one education, but also for a group of participants with different places of residence, mastering the new skills and protocols, renewal of knowledge and practical performance of appropriate interventions, trainings in all medical fields and in all levels of medical education. And that's exactly why blended learning is a new approach to improving the quality of medical education. [3]

Prior evidence suggests that students who complete course work using blended/hybrid modality (combination of in-person and online instruction) excel when compared to peers who may have access to only one form of instruction. Blended/hybrid learning offers a creative option to faculty and academic leaders so they can make information available to students even outside of the four walls of the classroom. This helps in optimizing and maximizing productivity of individual students during in-person sessions. [7]

V. Conclusion

Considering the length of training, our experience was positive and this hybrid model provided more benefits and highlights both face-to-face and online education for future education. And in that direction all 9 instructors rated the education in TRANSSIMED with the highest rating-5.
Students' opinions-preferences regarding hybrid model of education – online and face-to-face, have implications for further practices and/or policies. Limitations: The sample we had at this education makes it difficult to extrapolate the results. Exploring participant's opinions-preferences on hybrid model of education will be an ongoing research issue. After the pandemic and the forced full application of online education, the way is paved for more widespread implementation of the hybrid-blended learning mode in education.

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The role and good practices of patronage nursing in primary health care in Slovenia - A case study

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Abstract:

INTRODUCTION: Patronage care is a specialised area of nursing that deals with the holistic care of the individual, their family and the local community in which they reside, in all periods of health and illness. In Slovenia, patronage care is an important part of the primary health care network. It is essential that the work of the registered nurse in the patronage care is primarily carried out in the individual's home and in the local community. At the same time, she is also the coordinator of all the forms of support needed in the home by both the individual and the family. A registered nurse in patronage care is a family nurse. She cares for the individual and their family from before birth until death. She or he accompanies the family during the mourning period. In this article, we would like to give a brief overview of the area and organisation of the work in the patronage care. METHODS: In the preparation of this article, we have used a variety of literature that addresses the holistic health care of the individual at primary level in its various forms. This includes both preventive and curative treatments, which also include the area of work of patronage care. In addition, we have also included some statistics from the monitoring of the number of consultations in the patronage care before and during the COVID-19 epidemic. RESULTS: From the literature review and the regular monitoring of the number of visits over the years, it can be seen that the quantity and severity of consultations is changing and increasing from year to year, due to the irreversible ageing of the population in the field areas, and the reduction of the length of stay in hospitals hospital beds. Comparing the data on the number of attendances before and during the COVID-19 epidemic also shows an increase in the volume of attendance due to changes in the system of attendances at the primary health care level. CONCLUSION: In daily work patronage care face a variety of challenges that require to continuously adapt tha work and approaches according to the needs of individuals, their families and the local community in which they are involved. By successfully overcoming a wide range of challenges, the registered nurse continuously improves her professionalism and innovation. In this way, she helps to create the best possible conditions for the individual to stay as long as possible in his or her home environment, despite various obstacles.

Keywords: patronage care, registred nurse, individual, family and local community

INTRODUCTION

"Health 2020" (World Health Organization 2013), which is the starting point for health policy in 53 European countries, presents as common goals: to radically improve the health and well-being of populations, reduce health inequalities, strengthen public health and ensure people-centred health systems. It calls for a radical change in health policy to foster the development of primary health care based on prevention and management of disease and on convergence towards integrated, individualised and patient- and family-centred care. In this context, the importance and dynamism of the roles of health care providers is increasingly being highlighted. As Barrett et al (2016) note, many concepts and definitions have been developed about the provision of nursing care in the community and in the patient's home, which in Slovenia refer to as 'patronage care'. Dickson et al (2013) present seven key elements of community nursing: meeting community health needs, working directly with people, a public health approach, service coordination, supporting self-care, interdisciplinary collaboration and continuity of care.

In Slovenia, patronage care is an important part of primary health care, which differs from other primary health care activities in that it is primarily carried out in the patient's home, in the local community, in the field and also in the health centre. It is a polyvalent primary health care activity and is therefore a specialised area of nursing in its own right. It deals with the individual, the family and the local community in a specific field area during periods of health and illness. The provider in the patronage care is a registered nurse in the patronage care (RN) or a community nurse (CN), who identifies care needs, plans and implements interventions, and evaluates the objectives achieved. She advises on healthy lifestyles and points out risk criteria that may endanger the health of the individual, his/her family and the local community (Železnik et al., 2011). Due to the emerging demographic changes, the role of the registered nurse in the patronage care is constantly being upgraded and adapted according to the needs of the population and the development of long-term care services. The global goal of the registered

nurse in the patronage care is to achieve the well-being of the individual, the family and the community through services of a preventive, curative and social nature.

A registered nurse in the patronage care is a family nurse whose work reflects an understanding of the practice context and cultural characteristics necessary for the service user and their families to receive care that is evidence-based, of high quality and in line with their values and beliefs (McCormack, 2018). She cares for the individual and their family from before birth until their death. The individual's family is accompanied by registered nurse in patronage care at the mourning ceremony. (Ramšak Pajk et al., 2016) She is the home health care provider and coordinator of all forms of home support and the link between the individual and her/his personal doctor.

Coordinate the work:
- with services in the health centre,
- with your chosen personal doctor (adult healthcare, healthcare for pre-school, school children and young people, women's healthcare)
- other health teams (ambulance of specialist at primary level - anticoagulant ambulance , ambulanfe for diabetic, etc.)
- with secondary and tertiary level services (hospitals, rehabilitation centres, spas, etc.)
- with other services and organisations outside the health care system that can contribute in any way to the optimal solution of the individual's and family's situation (Home Care Services, Red Cross, Social Work Centres, local community, Senior Citizens' Homes, etc.) (Železnik et al. 2011).

STAFF WORKING IN RESIDENTIAL CARE

The working standard is 2500 individuals per single registered nurse in patronage care and 5000 individuals per single health technician (HT), provided that the network is filled with registered nurses.

In 2021, the document Staffing Standards and Norms in Nursing and Midwifery Care was published under the auspices of the Health and Midwifery Care Chamber - the Association of Professional Associations of Nurses, Midwives and Health Technicians of Slovenia (the Chamber - the Association). However, these are not yet in force. The chapter on preventive care provides for the recruitment of registered nurse in patronage care according to the following scheme:

- URBAN ENVIRONMENT: 2200 individuals or 1 registered nurse in patronage care per 1200 treatments
- SEMIRURAL ENVIRONMENT: 2000 individuals or 1 registered nurse in patronage care per 1090 treatments
- RURAL ENVIRONMENT: 1,800 individualss or 1 registered nurse in patronage care employee for every 980 treatments
- And 0.2 nursing technicians for every registered nurse in patronage care, which equates to 1 helath technician (HT) for every 5 registered nurse in patronage care.

As can be seen from the above data, the main actors in the patronage care are registered nurses, registered health professionals and, in some cases, a senior nurse. In some organisational units, however, there are also health technician working in the area of patronage care. The differences between these two profiles in the patronage care are exclusively in the competences they have in carrying out health education interventions.

The activity of private duty nursing can be carried out within health care institutions or as an independent concession, but in this case the registered nurse in patronage care must be integrated into the public health network and must take over all areas of activity (Železnik et al., 2011).

In Tabel 1, you can see the number of teams in the patronage care sector from 2013 to 2020, separately by level of education and in total.

THE CONTENT OF PATRONAGE VISITS

Based on the legal definitions of individual and family treatments in the context of health care, they can be divided into preventive and curative treatments. Preventive treatments are defined in the Regulations for the Provision of Preventive Health Care at Primary Level (hereafter referred to as the Regulations), which were issued in 1998 on the basis of the Health Care and Health Insurance Act and the Act on Health Care Activity. However, in practice it is often impossible to strictly distinguish between preventive and curative care. Because in the vast majority of curative treatments in the field, in addition to the provision of a range of health care services ordered by a doctor, many preventive measures are hidden, which are aimed at preventing the disease and its consequences (Ramšak Pajk et al., 2016).

The Regulations (1998), which have undergone many revisions over the years, stipulate that preventive care in patronage care includes:

- Family health education
- Health education in the local community
- An antenatal visit to a pregnant woman
- Attending a newborn and infant
- Patronage visit to a mother after childbirth
- Patronage visit to a child in the 2nd and 3rd year of age
- Patronage visits to risk groups (patients with active tuberculosis, muscular and neuromuscular disorders, tetra and paraplegia, multiple sclerosis, cerebral palsy, intellectual disabilities, disabilities, chronic illness and over 65 years of age)
- Consultative patronage visit to non-responders in prevention programmes (SVIT, ZORA, DORA)

Tabel 1:Number of teams contracted by National health Insurance Fund in Slovenia.

Year:	2013	2014	2015	2016	2017	2018	2019	2020
RN	707,31	715,93	719,03	725,83	740,98	750,41	783,50	822,99
HT	140,98	140,91	129,03	122,93	110,99	99,65	87,50	80,81
Total:	848,29	856,84	848,06	848,76	851,97	850,06	871	903,80

The most common procedures and interventions in the doctor ordered care are:

- Monitoring vital signs and health status in the patient at home
- Administering medicines to a patient at home
- Wound care (acute and chronic)
- Catheterisation in a woman in the home environment
- Application of the klistir at home
- Nursing care for a patient with a stoma
- Nursing care of the patient with nasogastric tube and feeding stomas
- Collection, preparation and transport of biological samples for laboratory tests
- Nursing care for a patient on continuous oxygen therapy at home
- Palliative care in the home environment
- Various other procedures and interventions as part of nursing care activities (peritoneal dialysis, vascular catheter care, pleural drainage care, elastomeric pain pump application, infusion application, etc.)

The chart above shows the growth in the number of patronage care appointments, which are divided into preventive and curative treatments. Statistically speaking, in 2012, was 80.82% of curative treatments and 19.18% of preventive treatments were carried out in the patronage care in Slovenia. In 2021, the proportion of curative treatments was already 86.62%, while the proportion of preventive treatments was only 13.38%. In 2020 and 2021, the implementation of preventive treatments was adapted to epidemiological measures. In particular, visits to pregnant women, children, newborns and infants were carried out without interruption, while other preventive visits, the omission of which could have negative consequences for patients' health, were carried out to a lesser extent.

THE CHALLENGES OF WORKING IN PATRONAGE CARE

Registered nurses in patronage care face many challenges in their work. The population is ageing at an unstoppable rate, leading to specific nursing and care needs for elderly patients. And hospital bed lengths are getting shorter. This is leading to an increase in the number of patients in the home environment

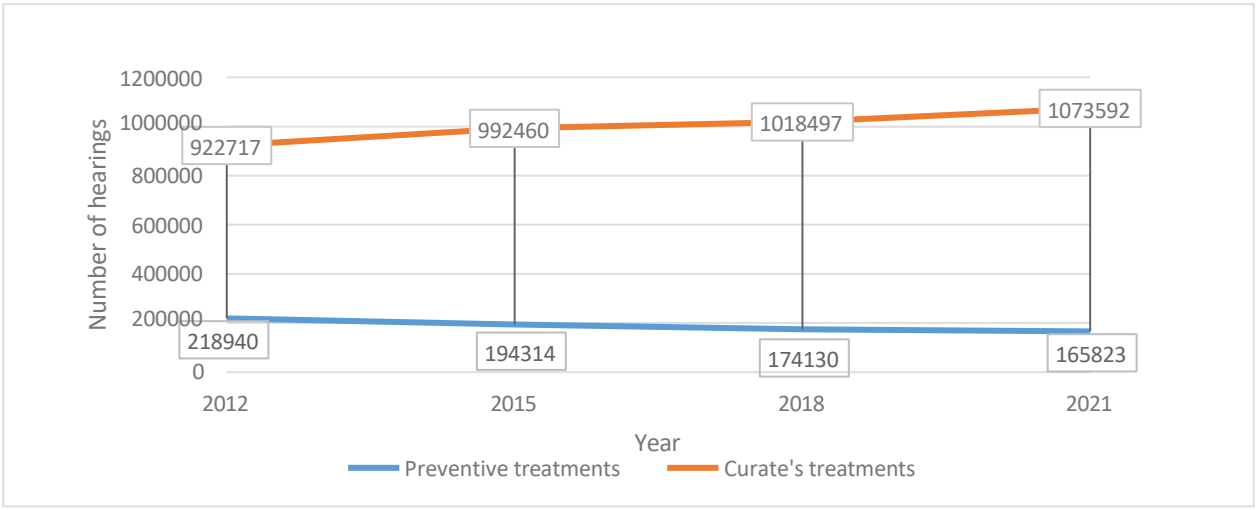

Diagram 1: Number of patronage preventive and curative appointments from 2012 to 2021

Year	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Appointments / example	1.141.657	1.140.302	1.148.462	1.186.774	1.207.608	1.197.204	1.192.627	1.212.633	1.184.649	1.239.415

Tabel 2: Number of appointments/exeples per year from2012 to 2021.

who require more complex and longer treatment, and thus an increase in the number of curative visits. Both of these facts, in turn, lead to the need to adapt daily work and approach to the needs of individuals and their families. More complex treatments require continuous education on the new medical-technical procedures and approaches that are being developed on a daily basis. Therefore, a major challenge in the patronage care is to achieve greater autonomy in work (Ramšak Pajk et al.,2016).

The strengths of registered nurses in patronage care are their exceptional knowledge of the community, where they perceive social and health problems in conjunction with the local community and other stakeholders, find appropriate solutions. In this way, they can help to create the conditions for the individual to stay as long as possible in the home environment, despite age, illness and handicaps (Ramšak Pajk et al. 2016).

In 2020 and 2021, the implementation of the patronage health service was clearly affected by the COVID-19 epidemic. Due to the epidemiological measures, both preventive and curative activities were curtailed. Only those patronage treatments were carried out, the omission of which could have had negative consequences on the patient's health (Statistical Yearbook of Health Statistics of Slovenia 2021).

PATRONAGE CARE DURING A COVID EPIDEMIC - 19

Over the last three years, healthcare at all levels has been particularly challenged by the COVID-19 epidemic, which has posed an additional challenge for the patronage care. The registered nurses in patronage care were often the first to enter the homes of families with sick individuals. There has also been an increase in the number of attendances per registered nurse in the patronage care due to increases in the number of work orders issued by ambulance of chosen personal doctor. The Association of Nurses and Health Care Technicians in Patronage Care, which operates under the auspices of the Chamber of Nurses and Health Care Technicians of the Federation, has prepared guidelines to help registered nurses in patronage care to carry out patronage visits during the epidemic.

The relationship of trust between the individual, their family on the one hand, and the registered nurse on the other, has been the most challenging at this time. Many times it appeared that individuals had concealed the fact that they themselves were ill or had close contact with someone who was ill. One of the challenges during the epidemic was the correct use of protective equipment. Because of the different weather conditions (wind, rain, sun, hot, cold), it proved to be a challenge to consistently follow the instructions for the correct fitting and removal of all the necessary protective equipment needed to come into contact with a sick individual when working in the field.

The Table 2 shows the number of services provided in the area of patronage care before and during the COVID-19 epidemic.

Over the 10-year period from 2012 to 2022, the number of employees in patronage care has increased by 8.8%, while the number of visits has increased by 8.6%. Compared to 2012, the number of visits per employee has remained almost the same according to the data (0.2% increase). In 2021, despite the reduced functioning of the health system due to the COVID-19 epidemic, there is a 2.8% increase in the number of visits per employee compared to 2020. Also in 2021, there is a record number of visits per 1,000 inhabitants, which is attributable to the reduced functioning and reduced access to other providers in the health care system (Health Statistical Yearbook of Slovenia 2021).

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Burnout in Family Medicine Trainees During Pandemic

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Abstract

Background

During the pandemic, burnout was shown worldwide to be associated primarily with increased workload, inadequate protective equipment, fear of infection and transmission of infection to others. The aim of the study was to determine the prevalence of the individual burnout dimensions, i.e. emotional exhaustion (EE), depersonalisation (D) and low personal accomplishment (PA), as well as the overall prevalence of burnout (MBI_{TOT}) in family medicine trainees and to identify factors associated with burnout. In addition, the study aimed to compare burnout prevalence during the pandemic with another Slovenian study where burnout prevalence among family medicine trainees was 18.3%, EE 45.9%, D 43.1% and PA 45.9%.

Methods

The study was quantitative and cross-sectional. Data were collected using an anonymous online questionnaire sent to the e-mail addresses of 230 family medicine trainees who were registered on the list of family medicine trainees at the Medical Chamber of Slovenia at the time of the study, between 19.4. and 15.7.2021. The questionnaire contained socio-demographic data, questions on workload, protective equipment, fear of infection transmission and the Maslach Burnout Questionnaire (MBI). Data were statistically analysed. using bivariate tests and multivariable regression modelling.

Results

The 102 participants (44.5% response rate) were 30.5 ± 2.5 years old and 81.4% were women. The mean duration of specialisation was 3.9 ± 2.0 years. Most of the participants were married or in a partnership (79.4%), more than half of them had children (53.9%) and 54.9% worked in cities. Half of them (52.9%) examined an average of 40-60 patients per day and 27.5% examined 60-80 patients per day. Most (79.2%) worked in COVID-19 clinics and were vaccinated (76.5%); one third (35.3%) worked there up to 5 hours per week and 15.7% worked more than 10 hours per week. The overall prevalence of burnout (MBI_{TOT}) was 48.6 %. The highest prevalence was 50.0% for EE (p=0.843), 51.0% for D (p=0.427), 70.6% for PA ($p < 0.001$) and 37.3% for all three combined (p=0.001), which could be attributed to pandemic-related conditions. Only 21.6% of trainees were not burnt out in any dimension – less than in 2012 (29.4%), but the difference proved not to be significant (p=0.193). Bivariate, it was not related to increased workload, but was most likely related to inadequate protective equipment (p=0.020), fear of becoming infected (p=0.005), fear of transmitting infections to family members (p=0.033) and parenthood (p=0.027).
Factors associated with non-burnout were not having been vaccinated (p=0.005) and not having children (p=0.026); further research is advisable to assess and interpret these characteristics.

Conclusions

The prevalence of burnout among family medicine trainees was higher during the pandemic than in 2012. Given the factors associated with higher burnout scores, it is reasonable to assume that pandemic-related anxiety and systemic unpreparedness acted as additional burnout factors.

Index terms: Burnout, family medicine trainees, emotional exhaustion, depersonalisation, personal accomplishment

I. Introduction

Burnout is known as a psychological syndrome described by three components: emotional exhaustion (EE), depersonalisation (D) and reduced personal accomplishment (PA), which occur as a sustained response to chronic stressors at work [1]. It usually occurs after at least one year in a particular position, as stressors then begin to accumulate, leading to cynicism and a decline in the individual's effectiveness [1-3].

It is more common in age groups over 30 or 40, in single men and in people with higher levels of education [1]. It occurs more often in people who have difficulty adapting to change, who trust others more than themselves, who have lower self-esteem and who tend to deal passively with stressful events [1,4], or in people who are overly committed to their work and want to achieve more than their colleagues, for example [2].

Burnout is associated with suboptimal patient care and an increased risk of medical errors. Doctors experienced lower productivity, lower job satisfaction, strained relationships with colleagues and an increased likelihood of leaving their jobs. The risk of alcohol or drug abuse and suicidal tendencies also increased [5-7].

In the Slovenian context, burnout in family medicine trainees was comparable to another study. A 2018 study that focused on

burnout and empathy in family medicine trainees and specialists showed an even lower percentage of individuals who were not affected by burnout than the 2012 reference study [8]. Burnout rates were higher among those with longer service time, a greater number of patients per day, doctors in rural areas and those with chronic diseases [9].

Before the pandemic, burnout among residents was known to be related to the burden of responsibility [10,11]. lack of sleep, lower salaries [10], insomnia, working more than 60 hours per week, poor access to supervising specialists and inadequate collegial support [12].

During the COVID-19 pandemic, work-related stress increased. Stress increased due to inadequate protective equipment, fear of infection, transmission to the home environment and patients [13-16], workers had to make difficult decisions (who to treat) and had less time for themselves or their families [15,17].

Residents exposed to SARS-CoV-2 patients had a higher prevalence of stress compared to those who were not exposed, and women were more prone to depression than men, while unmarried individuals were more prone to depression [18]. On the other hand, the data show that burnout was higher in regular departments due to insufficient education about protective equipment [19]. There was also a higher risk of developing depression, anxiety and insomnia [20].

II. Material and Methods

The aim of this study was to investigate the prevalence of burnout among internal medicine residents during the COVID-19 pandemic (from March 2020 to the completion of the survey on 15 July 2021) and to identify associated factors. It was hypothesised that the EE, D and PA prevalence of burnout and the overall prevalence of burnout (MBI_{TOT}) would be at least 5% higher than those reported in a reference study of burnout in trainees [8]. In addition, increased workload, inadequate protective equipment and fear of infection were expected to be associated with burnout.

The study was a quantitative study of a cross-sectional nature. Data were collected using an anonymous online questionnaire sent to the email addresses of family medicine trainees. 230 active trainees who had worked during the pandemic were invited to participate. Data collection took place from 19 April 2021 to 15 July 2021.

The questionnaire consisted of questions on socio-demographic data, questions on work and workload, adequacy of protective equipment and fear of transmission of infection, and the Maslach Burnout Inventory (MBI) [3] – Slovenian version.

Statistical analysis was conducted using IBM SPSS 28 for Microsoft Windows (IBM Corp., Armonk, NY). Results of categorical variables were presented as frequency and percentage, whereas continuous variables were presented as mean ± standard deviation. Bivariate statistical methods included chi-square test and one-way analysis of variance. The influence of independent variables on overall burnout was conducted using ordinal logistic regression. A significance level of $p < 0.05$ determined the threshold for statistical significance.

III. Results

The survey was completed by a total of 102 of the invited (response rate 44.5%) of family medicine trainees.

The mean scores for burnout according to the MBI [4] scales were as follows: EE: 26.5 ± 10.6; D: 10.8 ± 4.6; and PA: 29.1 ± 6.5. The results in Table 1 show that 45 (48.6%) respondents reported high levels of MBI_{TOT}. Regarding the individual dimensions, 51 (50.0%) reported high EE, 52 (51.0%) reported high D and 72 (70.6%) reported low PA. The prevalence of a high level of burnout in all three dimensions of the MBI was present in 37.3% of cases, while 21.6% did not report a high level of burnout in any MBI dimension. Compared to the 2012 study [8], only PA and high burnout level were statistically significant in all dimensions ($p < 0.001$ and $p=0.001$), EE ($p=0.843$), D ($p=0.427$), no high burnout level ($p=0.193$).

TABLE I. Prevalence of EE, D and PA (n=102)

	EE n (%)	D n (%)	PA n (%)	MBI_{TOT} n (%)
High	51 (50.0)	52 (51.0)	8 (7.8)	45 (486)
Medium	26 (25.5)	39 (38.2)	22 (21.6)	38 (31.9)
Low	25 (24.5)	11 (10.8)	72 (70.6)	19 (19.5)

The results of the bivariate analysis examining the relationship between the observed factors and overall burnout, as shown in Table 2, revealed statistically significant associations. High burnout was found to be statistically significantly associated with parenting ($p=0.027$), fear of personal infection ($p=0.005$) and fear of transmitting infection to family members ($p=0.033$).

TABLE II. BIVARIATE RELATIONSHIP BETWEEN OBSERVED FACTORS AND BURNOUT MBI_{TOT}

	All	MBI_{TOT}			p
	n=102 (%)	Low n (%)	Medium n (%)	High n (%)	
Gender					0.600*
Male	19 (18.6)	5 (26.3)	7 (18.4)	7 (15.6)	
Female	83 (81.4)	14 (73.7)	31 (81.6)	38 (84.4)	
Residency in family medicine (in years)	3.9 ± 2.0	3.5 ± 1.8	3.6 ± 2.0	4.4 ± 2.1	0.119#
Marital status					0.215*
Single	21 (20.6)	6 (31.6)	9 (23.7)	6 (13.3)	
Married/partnership	81 (79.4)	13 (68.4)	29 (76.3)	39 (86.7)	
Having children					0.027*
Yes	55 (53.9)	8 (42.1)	16 (42.1)	31 (68.9)	
No	47 (46.1)	11 (57.9)	22 (57.9)	14 (31.1)	
Work location					0.745*
Town	56 (54.9)	11 (57.9)	19 (50.0)	26 (57.8)	
In rural area	46 (45.1)	8 (42.1)	19 (50.0)	19 (42.2)	
Inadequate protective equipment	2.5±1.2	2.0±1.2	2.5±1.0	2.8±1.2	0.050#
Fear of transmitting infection to family members	3.8±1.0	3.3±1.4	3.8±0.8	4.0±1.0	0.033#
Fear of getting infected	3.0±1.2	2.2±1.1	3.3±1.0	3.1±1.3	0.005#
How many times per month did you work in the emergency department?					0.535*
I did not perform shifts	17 (16.7)	4 (21.1)	7 (18.4)	6 (13.3)	
1-2 times per month	40 (39.2)	4 (21.1)	15 (39.5)	21 (46.7)	
3 times per month	26 (25.5)	6 (31.6)	11 (28.9)	9 (20.0)	
4 times per month or more	19 (18.6)	5 (28.9)	5 (13.2)	9 (20.0)	
Average number of patients per day in your clinic?					0.112*
up to 40 daily	20 (19.6)	5 (26.3)	8 (21.1)	7 (15.6)	
40-60 daily	54 (52.9)	8 (42.1)	25 (65.8)	21 (46.7)	
60-80 daily	28 (27.5)	6 (31.6)	5 (13.2)	17 (37.8)	
How many hours per week did you work in a COVID-19 clinic?					0.252*
I did not work in a COVID-19 clinic	21 (20.6)	6 (31.6)	4 (10.5)	11 (24.4)	
up to 5 hours per week	36 (35.3)	7 (36.8)	11 (28.9)	18 (40.0)	
between 5 and 10 hours per week	29 (28.4)	4 (21.1)	15 (39.5)	10 (22.2)	
more than 10 hours per week	16 (15.7)	2 (10.5)	8 (21.1)	6 (13.3)	
Have you been vaccinated?					0.608*
yes	78 (76.5)	13 (68.4)	29 (76.3)	36 (80.0)	
no	24 (23.5)	6 (31.6)	9 (23.7)	9 (20.0)	

* chi-square test, # one-way analysis of variance

Multivariable ordinal logistic regression results showed that higher ratings of inadequate protective equipment increased the risk of burnout (OR=1.64; 95% CI=1.08-2.48; p=0.020). Doctors without children reported lower burnout (OR=0.27; 95% CI=0.09-0.85; p=0.026), and unvaccinated doctors reported lower burnout (OR=0.18; 95% CI=0.05-0.59; p=0.005). The independent variables explained 31.9 % of the original variance of the dependent variable, overall burnout (Nagelkerke R^2=0.319).

IV. DISCUSSION

The prevalence of burnout (MBI_{TOT}) in the study was 48.6% and 37.6% in all three dimensions, respectively (Table 1).

Comparing these results with the 2012 study by Selič et al. there were 19.3% more people with burnout. There were also more people experiencing high levels of burnout in all three dimensions, but statistically significant differences of 5% were only observed in the case of low PA. EE and D only slightly exceeded the predicted 5%. In addition, fewer respondents reported no burnout compared to previous studies [8].

Compared to the pre-pandemic meta-analysis, which included trainees from different disciplines, 12.9 % more people were affected by burnout [10]. Before the pandemic, the burnout rate among family medicine trainees in the United States was 36.8 %, but this study only considered EE and D, which makes a direct comparison with our results difficult, as a significant proportion of burnout was attributed to the low PA [11]. The only case with higher burnout rates before the pandemic was found in China, where at least 71.05 % were affected by burnout [12]. In our study, the percentage was closest to this in the low category PA (Table 1). Among the studies conducted during the pandemic, 2.3 % fewer trainees of different disciplines suffered from burnout in the United States than in our study [18]. Compared to the Romanian studies, fewer trainees suffered from burnout in our study, which could be due to better organisation of the health service [19].

Compared to the Slovenian burnout studies from 2012 and 2018, participants in this study had fewer children (Table 2). However, compared to previous studies, participants without children reported lower burnout rates, while participants with children reported higher burnout rates (Table 2) [8,9]. The association that single people would experience more burnout [1] was also not statistically significant (Table 2). Women were more numerous in the study and experienced more burnout (Table 2), similar to a pre-pandemic study [11]. However, this result was not statistically significant (Table 2). Statistically significant differences in the highest burnout scores between trainees from urban and rural areas were not found, in contrast to a 2018 study where EE higher scores were observed among doctors from rural areas [9].

One factor contributing to the higher burnout rate compared to the 2012 study could be the higher number of patients treated daily. As many as 18 % of the respondents treated 60-80 patients per day (Table 2). This could be due to a difference in counting "short visits", which may have already resulted in a higher patient load per day in 2012 [11]. However, it is noteworthy that the trend towards a higher daily patient load is also observed in the interim study, where 9.2 % more respondents reported seeing more than 60 patients per day than in 2012 [12]. The workload has also changed in terms of the number of shifts per month. More trainees were now involved in shifts in the emergency department (Table 2). More of them participated in shifts three times per month and fewer in shifts four times per month (Table 2). However, unlike in the 2012 study [11], a greater number of shifts was not associated with burnout. Increased workload (more patient visits and more shifts) was not associated with burnout (Table 2), as suggested by other global studies [1,4,8,10]. This could be due to youth (30.5 ± 2.5 years) and the initial enthusiasm of young doctors, who have not been exposed to various stresses for so long and may be better able to compensate for them. In comparison, older and more experienced doctors were more vulnerable to EE in the 2018 study [9]. On the other hand, almost half of the respondents in this study were affected by burnout, which is still a high percentage and can be related to Maslach's findings that young people at the beginning of their career may be more vulnerable to burnout due to lack of experience [1]. If such a high percentage of burnout is already present in our studied group due to other reasons, it is reasonable to assume that the burnout percentage will be even higher in a few years due to increased workload – it increases after passing the residency exam along with higher levels of responsibility [9], and given the current state of the country and projections for the future, there will be fewer doctors per patient in the coming years, leading to an even higher workload for those who remain.

Factors associated with burnout during the pandemic were inadequate protective equipment, fear of infection and fear of transmitting infection to family members (Table 2), which has also been demonstrated in other studies [13-16]. Working in a COVID-19 clinic was not statistically associated with burnout (Table 2) and is consistent with the Romanian study where burnout rates were lower in COVID-19 clinics compared to regular departments. In the COVID-19 clinics, clear treatment pathways and protocols were quickly established for patients, whereas this was more difficult to achieve in regular departments and clinics, especially with COVID-19 positive patient influx. COVID-19 Clinics also received more appropriate equipment earlier and staff were more familiar with the correct use of personal protective equipment [19].

The influence of vaccination has not been observed in other studies; in this study, non-vaccinated trainees reported lower burnout. This could be due to the personal characteristics of the individuals. Those who took a clear and firm stance, in this case against vaccination, may have been more decisive and confident in their decisions. They may have been more protective, taking more time for themselves and therefore less prone to burnout [1,4,8,10].

The results of this study should be interpreted with caution due to the low response rate, which could already indicate burnout, saturation with work in the clinics or simply

respondent fatigue. The low response rate might have influenced the final results, especially when comparing the frequency of EE and D, which was higher but did not exceed the predefined difference of 5% compared to the study by Selič et al. [8].

With each new doctor experiencing burnout, the risk of sick leave increases and consequently the workload is shifted to a smaller and smaller group of colleagues, which subsequently increases the level of burnout [1,10]. Given the very high rate of burnout among GP trainees and the current state of the healthcare system, it is crucial to regulate conditions at the primary level to create a safer and healthier future for all – workers and patients alike.

V. ACKNOWLEDGMENT

We sincerely thank the statistician Alojz Tapajner for the statistical analysis.

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Portal for patients – new way of electronic communication

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Abstract — **Background: In Slovenia, like in many other countries, family medicine specialists/general practitioners (GPs) are usually the first contact of a patient with a doctor. GPs help with numerous problems that patients have and represent a connection by referrals with specialists of secondary and/or tertiary level. Because they conduct many consultations daily, also by increasing demands (aging population, insufficient number of doctors in Slovenia), it is sometimes hard for a patient to come into a contact with his/her family medicine doctor. Also, e-mail communication is not in line with GDPR. To improve and provide a safer communication option, a new online tool has been implemented in Community Health Center Ljubljana, called »Portal for patients«. The purpose of this study was to assess user satisfaction with it.**

Methods: Quantitative study was conducted between March and May 2023 using an anonymous internet survey about Portal for patients that was put on the Portal, allowing anyone using the Portal to access it. Altogether 837 patients successfully completed the survey. Between them, there was 325 men and 505 women, with mean age of 49,8 years.

Results: T-analysis of answers showed that more than a half of users are satisfied with the program, do not have technical issues, and found it easy to learn to use the program. In average they do not think that the responsiveness or communication with the family medicine office has improved with the introduction of the Portal, nor that the use of the Portal contributes to the quality of medical treatment in primary care.

Conclusions: Portal for patients is a new tool of electronic communication between family medicine offices and their users (patients). It is generally well received among patients but according to our survey, people believe that it needs some technical improvements. It can also only replace e-mail, while patients want to still be able to communicate with family medicine office by phone, regular mail and in person.

Index Terms – **communication, general practitioners, family medicine office, patient, Portal for patients.**

I. Introduction

Good organization of work in health care is a prerequisite for patients to receive adequate health care. Besides that, patients appreciate good accessibility to a doctor, involving patients in treatment and sufficient time for consultation with a doctor [1].

Communication between doctors and patients is the central driving force in formation of a relationship between the doctor and the patient, and the relationship itself is key to ensuring quality treatment [2].

Performance and quality of work in a family medicine office does not depend only on doctor's professional knowledge and skills. The following organizational elements are also important: location, size, equipment and arrangement of the clinic, quality and flawlessness of medical equipment, coordinated and well-organized teamwork. Effective internal organization of health centers and clinics have been proven to improve the quality of medical care [3].

General practitioners (family medicine specialists) in Slovenia conduct many consultations daily. Aging population and insufficient number of doctors in the country represent a challenge. Therefore, patients sometimes find it hard to encounter their family medicine doctor.

Computer software is useful to family medicine offices in all segments of the organization of patient care (ordering a consultation or examination, prescribing electronic recipes and referrals, managing the patient's sick leave and other administration activities and documentation). But e-mail communication is not in line with GDPR (General Data Protection Regulation).

Because of all stated above, a new online tool has been implemented in Community Health Center Ljubljana, called »Portal for patients«. The purpose of this study was to present this new technology and assess user satisfaction with it.

II. Material and Methods

- Type of study: This was a quantitative study.

- Participants: We conducted an online survey, that was accessible to all patients of Community Health Center of Ljubljana, that have already registered and have been using the tool »Portal for patients«. The survey was conducted between March and May 2023. We received 837 fully completed questionnaires by patients.

- Data collection: The survey was anonymous.

The first 3 questions were about age, gender and level of education.

Then there were 13 questions regarding user satisfaction with »Portal for patients«. This set of questions was composed in a way that the participants had to answer with one of the options:

1 – I do not agree at all.

2 – I do not agree.

3 – I cannot define myself.

4 – I agree.

5 – I totally agree.

The last question was open type. We asked the participants if they want to share something else with us.

- Statistical analysis:

We calculated the sum score from all items. We used a Baker & Hearnshaw equation [(∑items 1±i) × 100/(5 × i)] × 1.25±25) to range the scale's score from 0 to 100 [4]. ∑items 1±i represents the sum of the scores of i items; 5 represents the maximum score points of each item; and i represents the number of items. The other numbers are needed for mathematical purposes in order to range the scale's score from 0 to 100.

For each factor, we also calculated the Cronbach's alpha.

For bivariate analyses, we used independent t-test and Pearsin correlations.

III. Results

There were 837 respondents in a sample, out of which 505 (60.8%) were women (Table 1). The mean age of the sample was 49.8 ± 15.0 years.

Table 1: Gender and level of education

	Frequency	Valid percent
Men	325	39.2
Women	505	60.8
1st level - Unfinished primary school	3	4
2nd level - Finished primary school	16	1.9
3rd level – Lower Secondary education (2-year program)	16	1.9
4th level – Upper Secondary education (3-year program)	75	9
5th level – High school (4-year program)	212	25.3
6th level 1 – Post-secondary non-tertiary education	92	11
6th level 2 – Short-cycle tertiary education	106	12.7
7th level – Bachelor's or equivalent level	237	28.3
8th level – Master's or equivalent level	80	9.6

Cronbach's Alpha of the questionnaire was 0.915. Mean of the sum score was 58.9 ± 22.5 points.
Participants agreed the most with the item "For using the Portal I do not need help, for example of a family member or a friend.", and the least with the item "The people who care for me and affect me, want me to use the Portal" (Table 2).

Table 2: Average response to individual question

	Mean	Standard Deviation
1. The people who care for me and affect me, want me to use the Portal.	2.88	1.31
2. My nurse and family medicine doctor encouraged me to use the Portal.	3.14	1.38
3. Learning to use the Portal was easy for me.	3.62	1.28
4. I have no technical problems using the Portal.	3.52	1.32
5. I know how to access the Portal.	4.12	0.93
6. Using the Portal has become a habit for me.	3.51	1.31

7. For contacting family medicine office, I like to use the Portal the most (rather than the phone, e-mail).	3.14	1.47
8. For using the Portal I do not need help, for example of a family member or a friend.	4.15	1.16
9. Responsiveness and communication with family medicine office have improved.	3.15	1.26
10. I am satisfied with Portal for patients.	3.19	1.29
11. I have a feeling that using the Portal contributes to quality of medical treatment.	2.95	1.24
12. I would recommend using the Portal to my friends and family.	3.18	1.34
13. Using the Portal allows me to be more involved in my own medical care.	3.07	1.26

Table 3: Differences regarding gender

Item	Mean (male vs. female)	t-test	p-value
The people who care for me and affect me, want me to use the Portal.	3.0 ± 1.3 vs. 2.8 ± 1.3	2.1	0.04
I have no technical problems using the Portal.	3.7 ± 1.3 vs. 3.4 ± 1.3	2.4	0.02
Using the Portal has become a habit for me.	3.6 ± 1.3 vs. 3.4 ± 1.3	2.0	0.05
For contacting family medicine office, I like to use the Portal the most (rather than the phone, e-mail).	3.4 ± 1.4 vs. 3.0 ±1.5	3.6	< 0.01
I have a feeling that using the Portal contributes to quality of medical treatment.	3.1 ± 1.3 vs. 2.9 ± 1.2	2.8	0.01
I would recommend using the Portal to my friends and family.	3.3 ± 1.3 vs. 3.1 ± 1.3	2.4	0.02
Using the Portal allows me to be more involved in my own medical care.	3.2 ± 1.2 vs. 3.0 ± 1.3	2.9	0.003

Table 4: Differences regarding education

Item	Mean	t-test	p-value
For using the Portal I do not need help, for example of a family member or a friend.	finished **primary school**: 2.5 ± 1.5 vs. other: 4.2 ± 1.1	-4.8	< 0.001
The people who care for me and affect me, want me to use the Portal.	finished **secondary education**: 3.1 ± 1.2 vs. other: 2.8 ± 1.3	2.2	0.03
I know how to access the Portal.	finished **secondary education**: 3.8 ± 1.1 vs. other: 4.2 ± 0.9	-2.5	0.02
For using the Portal I do not need help, for example of a family member or a friend.	finished **secondary education**: 3.7 ± 1.5 vs. other: 4.2 ± 1.1	-3.3	0.001
For contacting family medicine office, I like to use the Portal the most (rather than the phone, e-mail).	finished **high school**: 3.4 ± 1.4 vs. other: 3.1 ± 1.5	2.7	0.01

Responsiveness and communication with family medicine office have improved.	finished **high school**: 3.4 ± 1.2 vs. other: 3.1 ± 1.3	3.3	0.001
I am satisfied with Portal for patients.	finished **high school**: 3.4 ± 1.2 vs. other: 3.1 ± 1.3	2.5	0.01
I have a feeling that using the Portal contributes to quality of medical treatment.	**finished high school**: 3.1 ± 1.2 vs. other: 2.9 ± 1.3	2.1	0.04
I would recommend using the Portal to my friends and family.	finished **high school**: 3.3 ± 1.3 vs. other: 3.1 ± 1.3	2.0	0.05
Using the Portal allows me to be more involved in my own medical care.	finished **high school**: 3.3 ± 1.2 vs. other: 3.0 ± 1.3	3.9	< 0.001
I know how to access the Portal.	finished **tertiary education**: 4.2 ± 0.8 vs. other: 4.0 ± 1.0	2.4	0.02
For using the Portal I do not need help, for example of a family member or a friend.	finished **tertiary education**: 4.3 ± 1.0 vs. other: 4.0 ± 1.3	3.8	<,001
For contacting family medicine office, I like to use the Portal the most (rather than the phone, e-mail).	finished **Bachelor's or Master's level**: 2.8 ± 1.5 vs. other: 3.2 ± 1.5	-2.0	0.05
Responsiveness and communication with family medicine office have improved.	finished **Bachelor's or Master's level**: 2.7 ± 1.3 vs. other: 3.2 ± 1.2	-2.8	0.006
I am satisfied with Portal for patients.	finished **Bachelor's or Master's level**: 2.7 ± 1.3 vs. other: 3.2 ± 1.3	-3.5	< 0.001
I have a feeling that using the Portal contributes to quality of medical treatment.	finished **Bachelor's or Master's level**: 2.5 ± 1.3 vs. other: 3.0 ± 1.2	-3.2	0.002
I would recommend using the Portal to my friends and family.	finished **Bachelor's or Master's level**: 2.8 ± 1.4 vs. other: 3.2 ± 1.3	-2.3	0.02
Using the Portal allows me to be more involved in my own medical care.	finished **Bachelor's or Master's level**: 2.6 ± 1.3 vs. other: 3.1 ± 1.2	-3.6	< 0.001

Table 5: Differences regarding age

Item	**Pearson coefficient**	**p-value**
The people who care for me and affect me, want me to use the Portal.	0.138	< 0.001
Learning to use the Portal was easy for me.	-0.182	< 0.001

I have no technical problems using the Portal.	-0.087	0.01
I know how to access the Portal.	-0.125	< 0.001
For using the Portal I do not need help, for example of a family member or a friend.	-0.295	< 0.001
I am satisfied with Portal for patients.	0.576	< 0.001
I have a feeling that using the Portal contributes to quality of medical treatment.	0.503	< 0.001
I would recommend using the Portal to my friends and family.	0.588	< 0.001
Using the Portal allows me to be more involved in my own medical care.	0.514	< 0.001

In the last, open type question, we received many comments, short and long, some positive and welcoming to the new software, while others were negative and critical. Here are some examples of the patient's comments:

- "It is necessary to eliminate character limit in messages. Writing messages should work non-stop, even when the doctor is absent. When another doctor substitutes, the messages should be transferred directly to his office."
- "We were practically forced into using the Portal, but it did prove to be good novelty. I would like an easier access to Portal (without simultaneous e-mail use). As the Portal allows sending only 1 message until the doctor answers, this should be clearly visible (it would be even better if you could send more messages, sometimes the need for this appears later)."
- "Authentication of access to the Portal is not user friendly (when requesting for access it requires sending additional codes by text message and e-mail every time). During the time when the doctor's office doesn't work, I couldn't write a message. Also the appearance of the application (look and feel) is rather clumsy and obsolete. Responsiveness of nurse and doctor on the other hand is more than satisfactory."
- "We need improvements also in telephone contact. Some seniors do not have a computer or they don't know how to use it."
- "Access to health care has improved by using the Portal in my opinion. Good system."
- "The idea of Portal itself is excellent. The execution is on low technical and user level. From a programmer's point of view, I think that you are capable of much better."
- "Thank you."
- "I made the decision myself for using the Portal and I also encourage others to use it. I hope I can take care of myself as long as possible. As for claims that the use of the Portal contributes to a better medical treatment: it truly does provide a faster contact with the doctor, but still, as a representative of the old generation, I prefer personal contact with my doctor. Kind greetings!"
- "No Portal will ever and in no way compensate the direct contact between patients and doctors. At least until (I hope never) AI will not be on higher mental and emotional level of development from homo sapiens."
- "I have no comments. I am glad you introduced the Portal for patients."
- "The portal is a great thing for bureaucratic matters that have to be done, but by no means can replace a visit to the doctor when this is necessary. I was helping older family members to use it - they just needed encouragement and a little practice and now they are grateful, because contact like this is sometimes easier. I support the Portal and above all, centralization of medical documentation in electronic form."
- "All changes are initially unpopular, but eventually you get used to it and you see that it is really great (no waiting in line, no waiting on the phone). You can see your file, past medications, ongoing therapy, conversations are possible, responsiveness of doctors and nurses is faster. I must also say that I had a very responsive doctor and nurse even before the introduction of the Portal. I believe that for older generation it is more difficult to use the Portal, but hopefully they can get help from their children, grandchildren, neighbors and in any case the family medicine office is still available to them by telephone. Best regards."

IV. DISCUSSION

It has been noticed that many patients in Slovenia find it difficult to get in touch with their GPs. To fasten the accessibility of family medicine offices, a new online tool has been implemented in Community Health Center Ljubljana, called »Portal for patients«.

The Portal is a safer communication option than regular e-mail in view of compliance with EU general data protection regulation (GDPR). Registration to Portal is possible in two ways: registration using SIGEN-CA and SIGOV-Ca certificates and SI-PASS directly on the Portal (https://portal.zd-lj.si/register) or registration with personal identification at the clinic - the medical staff adds the patient to the system and sends two registration codes (one by e-mail, the other by text message on mobile phone); which are valid for 24 hours. The patient can also authorize another person if he does not have his own email address and mobile phone number. In this case, the authorized person completes the registration process, and the authorizer signs the authorization [5].

As the technology is new (it has been implemented at the end of the year 2022), we wanted to access user satisfaction with the help of an internet survey.

Examining the answers of 837 participants of our survey, we found that the Portal is generally well received among patients. In 11 out of 13 questions, the answers were more positive (scoring higher than 3 out of 5 points). That means more than a half of participants stated that medical staff encouraged them to use the Portal, that learning to do so was easy for them, that they had no technical problems, know how to access the Portal, it has even become a habit for them and they do not need help, for example of a family member or a friend for using it. They also in larger proportion think that responsiveness and communication with family medicine offices have improved, are satisfied with Portal for patients, would recommend using it to their friends and family and believe using it allows them to be more involved in their own medical care.

Only in 2 out of 13 questions the answers were more negative; less than a half of participants believe that people who care for them and affect them, want them to use the Portal and think that using the Portal contributes to quality of medical treatment.

In 7 out of 13 questions we found statistically important difference in answers between gender of participants. In all of those, the men answered more positively and welcoming to new technology than women.

Statistical analysis also showed some differences in answers regarding to the levels of education of participants:

- Participants with finished primary school need more help for using the Portal compared to everyone else.
- Those with finished secondary education find it harder to access the Portal and in comparison to everyone else need more help with it.
- Those with finished high school to a greater extent compared to all others believe that communication has improved, that the Portal contributes to quality of medical treatment and allows them to be more involved in their own medical care, are more satisfied and would recommend the Portal to their friends and family.
- Those with Bachelor's or Master's or equivalent level of education were in 6 out of 13 questions less satisfied with new technology than everyone else. They don't believe that responsiveness and communication with family medicine office has improved nor that it allows them to be more involved in their own medical care.

There have been some statistically important differences in answers regarding age of the participants as well, and those answers are represented in Table 5. In answers with positive Pearson coefficient, the older the participants age, more positive they evaluated the Portal (in questions about whether the medical staff recommended the Portal to them, if they are satisfied with the Portal, if they have a feeling that using it contributes to quality of medical treatment, if they would recommend using it to their friends and family and if it allows them to be more involved in their own medical care). And on the contrary; in those questions with negative Pearson coefficient, the older the participants age, less satisfied they are with the Portal (questions about learning how to use the Portal, technical problems, accessing the Portal and the need for help using it).

While reading the comments participants wrote in open question at the end of the survey, one thing was clear: people think that Portal for patients can only replace e-mail, they want to still be able to communicate with family medicine office by phone and, of course, in person.

Of course this tool, like other computer and mobile applications, may be hard for the older generation to use and understand, but they can hopefully get help from their close ones and if not, continue to use telephone as the first communication tool.

As some of the participants of the survey stated, some technical improvements would be welcome, for example simplifying the access. But then the safety of personal information would be in question.

Portal for patients is a useful tool, but it does not in any case substitute to a patients visit at the doctor in person. It just simplifies and fastens the contact with family medicine office, and makes it easier to set an appointment. It is useful for getting quick information and advice, as well as managing administrative matters, such as writing electronic recipes, referral letters to control examinations by other specialists, ending sick leaves and so on.

In further systematic improvements it will remain important to find the right balance between the capacity of family medicine offices and the actual needs of patients on the other hand. All available communication options need to be used, but the choice of each primarily depending on individual patient's needs.

V. CONCLUSSION

Portal for patients is a new tool of electronic communication between family medicine offices and their users (patients). It is generally well received among patients but according to our survey, people believe that it needs some technical improvements. It can also only replace e-mail, while patients want to still be able to communicate with family medicine office by phone, regular mail and in person.

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The impact of the covid-19 epidemic on the newly diagnosed patients with arterial hypertension and type 2 diabetes and their management in family medicine clinics of the Maribor region

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Abstract

Background

The aim of this study is to find out whether COVID-19 epidemic measures have affected the number of newly diagnosed patients with arterial hypertension and type 2 diabetes in the general population.

Methods

A study of data from two family medicine clinics within the ZD dr. Adolfa Drolca Maribor (ZP Rače) and two private family medicine clinics (SAVA MED d.o.o. and MEDIKUS d.o.o.) in Sp. Duplek were carried out. The study included all patients with newly diagnosed arterial hypertension (MKB DG: I10) or type 2 diabetes (MKB DG E11.) in the period between 2018 and 2021. The data was obtained through the health information system ProMedica and by inspecting the electronic medical record files of the mentioned clinics.

Results

The results for RA Rače and RA Duplek show 57 (167.6%) more newly diagnosed cases of arterial hypertension and 43 (134,4%) more newly diagnosed cases of type 2 diabetes in the period before the epidemic compared to the period during the epidemic. The increase in the number of newly diagnosed cases is therefore statistically significant. The percentage of first follow-up health check-ups of patients with newly diagnosed arterial hypertension in 2018/19 was 53.8 vs. 52.9 during the epidemic and newly diagnosed type 2 diabetes was 62,7 vs. 53,1. In these cases the difference was not statistically significant.

Conclusion

In the years 2020 and 2021 there were considerably fewer newly diagnosed patients. The patients who were diagnosed with a chronic non-communicable disease, nevertheless received treatment in accordance with medical care guidelines.

***Index Terms*-- preventive health care, arterial hypertension, type 2 diabetes, COVID-19, family medicine.**

I. INTRODUCTION

Prevention

The word prevention comes from the Latin word "praevenire" (prea - before and venire - comes) and means to prevent an event (disease, accident) before it even happens by taking correct and timely action(1).

Prevention in healthcare deals with health protection, disease prevention and timely detection and treatment of diseases.

We know four types of prevention(2):

• *primary prevention*

The aim of primary prevention is to improve the state of health and prevent the onset of disease. It includes a healthy population with a very low risk of developing diseases, which we want to further educate about the risk factors for the development of various diseases or to protect against the development of diseases (e.g. mandatory vaccination program, smoking prevention, salt iodization).

• *secondary prevention*

The goal of secondary prevention is the detection of preclinical stages of the disease, their diagnosis and early treatment. It covers healthy people with a high risk of developing the disease (smokers, overweight people).

• *tertiary prevention*

The aim of tertiary prevention is to prevent the progression of the disease (treatment, monitoring). It focuses on the psychological, physical and social rehabilitation of patients. It tries to prevent complications of the disease and preserves impaired abilities and establishes optimal functioning.

• *quaternary prevention*

The goal of quaternary prevention is measures that protect individuals (healthy individuals or patients) from medical interventions that could cause more harm than good(3,4).

In the Republic of Slovenia, we have had a program of primary prevention of cardiovascular diseases since 2000, which was

initially implemented as part of the CINDI program(5). In 2011, at the level of family medicine clinics, the project of reference clinics began to be implemented, the purpose of which is primary and secondary prevention of the most common chronic non-communicable diseases (CNC)(6). A registered nurse works in the referral outpatient clinic, and her work is aimed at screening the defined adult population and monitoring well-managed patients with a stable, well-managed chronic disease(6).

Arterial hypertension

AH is an important risk factor for cardiovascular diseases. Lifestyle factors (physical inactivity, risky drinking of alcoholic beverages, salting of food, obesity) and heredity play a role in its development. In more than 90% of patients with AH, the cause of the disease is unknown, and therefore we speak of essential AH(7). In 10% of patients, we are talking about secondary AH, where the cause of AH is known (diseases of the thyroid, adrenal glands, kidneys, as a result of taking certain medications)(7) and it is treated by treating the underlying cause.

A screening test for AH is blood pressure measurement. We speak of AH when the patient has several consecutive blood pressure measurements above 140/90 mmHg(8).

The diagnosis of AH (I10) is made when the blood pressure is elevated during at least two visits to the family medicine clinic or when the average of the elevated blood pressure values measured at home in the morning and in the evening for seven consecutive days.

Treatment includes lifestyle changes (dietary measures, regular exercise, maintaining a suitable body weight, limiting the intake of alcoholic beverages and stopping smoking), regular blood and urine laboratory tests, ECG measurement and, if necessary, the introduction of a suitable antihypertensive drug(9). Most antihypertensive drugs lower mean systolic pressure by 10-15%(10).

The appropriate treatment must be selected individually for each patient, depending on the level of AH at the time of diagnosis and its associated diseases.

Type 2 diabetes

The term diabetes refers to a group of different diseases that have in common an excessively high level of glucose in the blood. The diseases differ according to their pathophysiology and are divided into type 1 diabetes, type 2 diabetes, gestational diabetes and secondary diabetes. The most common type of diabetes is type 2 diabetes (DM2), which accounts for approximately 90% of all diabetes(11).

The DM2 screening test is a measurement of fasting blood glucose in people with known risk factors for DM2 (12).

The diagnosis of DM2 (E11.9) is made on the basis of measured fasting blood glucose or by OGTT in persons with borderline basal glycemia(13):

In order to be included in the screening program for DM2 in the referral clinic, an individual must meet certain criteria(14).

Inclusion criteria:

• defined persons over 30 years of age.

Exclusion criteria:

• patients with already known and treated diabetes,

• patients with already known and treated arterial hypertension,

• patients with already known and treated cardiovascular disease.

Treatment of DM2 includes lifestyle changes (weight loss, dietary measures, regular exercise, restriction of alcohol intake and smoking cessation). It has also been shown that a very important factor in the successful treatment of diabetes is patient education about the nature and causes of the disease(15). The goal of DM2 treatment is to reduce blood glucose to a value of Hb1Ac <7 in the long term and thereby prevent microvascular complications of the disease. Higher average values of Hb1Ac are allowed in elderly patients and in patients with a shorter life expectancy, as in these patients it is assumed that a more intensive therapy would result in a higher cost of treatment and at the same time worsen the quality of life(16).

The epidemic of COVID 19

In order to prevent the spread of the Coronavirus disease 2019 (COVID 19), general measures have been taken all over the world (care for hand hygiene, wearing a surgical mask indoors and social distance of at least 1.5m). All non-essential services were closed, public events were cancelled, gatherings of people were prohibited.

During the first wave of the epidemic, the implementation of preventive programs was interrupted several times in Slovenia. All preventive activities were abandoned only during the first interruption, and during the following interruptions, the scope of preventive services was reduced mainly due to the redeployment of personnel due to additional activities that were necessary to contain the spread of infections (taking swabs, vaccinations, setting up call centers, etc. .)

The purpose of the research was to determine the impact of the COVID-19 epidemic (in 2020 and 2021) on the number of newly diagnosed AH and DM2 patients and what their further management was in the family medicine clinics of the Maribor region.

II. Material and Methods

Type of research and place of implementation

A quantitative retrospective study was conducted. Data from the medical records of two family medicine clinics of the Medical Center dr. Adolfa Drolca Maribor (ZP Rače), and data from two family medicine clinics of private providers (SAVA MED d.o.o. and MEDIKUS d.o.o., Sp. Duplek).

A sample

Data were collected from ZP Rače, within two clinics of the Medical Center Dr. Adolfa Drolca Maribor and data from the medical records of two private family medicine clinics (SAVA MED d.o.o. and MEDIKUS d.o.o.) from Spodnji Duplek.

All patients who were newly diagnosed with AH (MKB DG: I10) or DM2 (MKB DG: E11.9) in the years 2018-2021 were included. Sample data were obtained using the ProMedica health information system from the annual reports of the works for an individual referral clinic and reviews the electronic medical records of the aforementioned family medicine clinics.

In the second part of the research, we examined the electronic medical records of patients who were diagnosed with the disease between 2018 and 2021 to see if they had a check-up at the referral clinic within six months of the diagnosis.
Patients in whom AH or DM2 was detected before 2018 or after 2021 were not included in the study.

Data collection and description of variables

The patients were divided into two groups, namely those in whom the disease was detected during the years 2018-2019 and those in whom the disease was detected during the years 2020-2021. Each group was then further divided into two subgroups, those who had a follow-up examination at the reference clinic within half a year after the diagnosis and those who did not. The time interval of observation in both cases was the same. Some control examinations (of those patients who had the disease detected towards the end of 2021) were also carried out in the first half of 2022, when there is officially no longer an epidemic, but all preventive measures remain recommended in healthcare.

Statistical analysis

Categorical variables were presented as numbers and percentages. Covariate variables were presented with mean values and standard deviation. In the first hypothesis, the binomial test was used to analyze the statistically significant difference in the prevalence of the research and control groups. Binomial test and Fisher's exact test were used to compare categorical variables in the second hypothesis. The limit of the statistical characteristic was determined by a value of $p < 0.05$. The results were processed using Microsoft Excel 2016 MSO.

Research ethics

The research was approved by the Medical Ethics Commission of the Republic of Slovenia (Decision No. 0120-128/2022/3, April 21, 2022).

III. Results

Table 1: Newly diagnosed chronic diseases in 2018/19 and 2020/21

Chronic disease	Period	
	2018/19	2020/21
Arterial hypertension	91	34
Sladkorna bolezen	75	32

The binomial test showed that the number of newly diagnosed AH cases was statistically significantly higher before the epidemic ($p<0.001$). Also, in the period before the COVID-19 epidemic, 43 and 43 134.4% more DM2 cases than during the epidemic. The binomial test showed that the number of newly diagnosed DM2 cases was statistically significantly higher before the epidemic ($p<0.001$).

Table 2: First Control examination after detection of AH in 2018/19 and 2020/21

Period	First control examination after detection of AH		Total newly discovered n (%)
	da n (%)	ne n (%)	
2018/19	49 (53,8)	42 (46,2)	91 (100,0)
2020/21	18 (52,9)	16 (47,1)	34 (100,0)

Fisher's exact test did not show a statistically significant difference regarding the proportion of control first examinations of arterial hypertension between the two periods ($p=1.000$).

Table 3: Control first inspection after detection of DM2 in 2018/19 and 2020/21

Period	First control examination after detection of DM type 2		Total newly discovered n (%)
	da n (%)	ne n (%)	
2018/19	47 (62,7)	28 (37,3)	75 (100,0)
2020/21	17 (53,1)	15 (46,9)	32 (100,0)

Fisher's exact test showed no statistically significant difference in the proportion of control first DM2 examinations between the two periods ($p=0.394$).

IV. Discussion

It turned out that in the period before the COVID-19 epidemic, 57 and 167.6% more cases of AH than during the epidemic were diagnosed. Also, in the period before the COVID-19 epidemic, 43 and 43 134.4% more DM2 cases than during the epidemic were diagnosed.

A 2011 World Health Organization survey found that approximately 55 million people die each year, with 2/3 of the deaths being caused by non-communicable chronic diseases, including cardiovascular disease, diabetes, lung disease and cancer(18). Considering that in 2020-2021 we had a reduced prevention program and consequently less detection of chronic non-communicable diseases, in the coming years we can expect more people in whom AH and DM2 will be detected in later stages, as a result, complications of the disease will also be associated more often .

Preventive measures implemented at the national level must be cost-effective or have a significant impact on the quality of life. The most cost-effective interventions are usually those aimed at higher-risk populations. In screening, efficiency also depends on frequency (more frequent screening brings greater benefits, but is less financially efficient)(19).

In 2014, it was estimated that by 2023, the number of non-communicable chronic diseases in the USA will grow by 42%, which will cost the country 4.2 billion US dollars due to the increased volume of patient treatment and reduced economic activity of the population(20). A 2017 Monte Carlo study showed that early detection and treatment of AH has the greatest annual financial savings(21).

On the other hand, the American Diabetes Association has estimated that the costs of medical care for patients with diabetes are twice as high as for people without diabetes, mainly due to patient backlogs, reduced productivity due to the consequences of the disease, and premature mortality(22).

In Slovenia, the direct medical costs of diabetes in 2012 were estimated at EUR 114.3 million, of which 35% were medicines, 14% medical devices, 14% hospital treatment and 13% care in social institutions. Other costs of treatment and management of the disease, including visits to the doctor at the

primary and secondary level, accounted for around 25% of the annual costs(23).
In addition to the direct costs, the indirect costs of the disease are also added, which include the financial consequences of lost productivity due to morbidity and mortality. In this same research, the estimated indirect costs amounted to EUR 5.5 million, of which the patient stock was EUR 2.3 million and the lost future income was EUR 3.2 million. Due to the lack of data on disability and premature retirements as a result of diabetes, it was not possible to estimate this cost completely accurately, so the estimate of indirect costs is also significantly underestimated(23).
In 2020, there were 118,215 recipients of glucose-lowering drugs in Slovenia, which is 1.6% (1,841 people) more than in 2019 or as much as 41% (34,570 people) more than in 2008. They calculated that there are about 20% of such people whose diabetes is not detected and about 15% of those who are treated non-pharmacologically. If we add the estimate to the actual number of patients with diabetes, there are around 173,846 people with diabetes or 8.3% of the population (24).
In 2021, SARS-CoV2 infection was also added to the narrower set of indicators for monitoring the management of diabetes in Slovenia. According to data for 2020, more than one quarter of those who died from COVID-19 (the main cause of death) received diabetes medication in the year before the date of death(24).
Impact of the COVID-19 epidemic on the management of patients with arterial hypertension and diabetes
The primary goal of treatment for AH and DM2 is to prevent the occurrence of cardiovascular diseases and prevent premature mortality, so early detection and prevention of the disease is even more important.
The treatment of non-communicable chronic diseases includes, in addition to medication, lifestyle changes, weight loss, dietary measures, etc., which primarily requires motivation. People can gain part of their motivation by regularly monitoring their health status and its improvement. This is achieved, among other things, through regular check-ups in the general medicine clinic or in the reference clinic. Therefore, follow-up examinations are almost as important to the general health of the population as early detection of the disease. In 2018, at the Congress of the European Association for Preventive Cardiology EuroPrevent, in which Slovenia also participated, the results of the EuroAspire survey were presented, which shows that many coronary patients also have diabetes. A glucose stress test was performed on patients hospitalized for heart attack and the proportion of patients with DM2 was shown to increase by 2x. In our area, 53% of patients who have suffered a heart attack also have DM2. Coronary patients with diabetes, however, have up to four times higher risk of recurrent cardiovascular complications. In such patients, therefore, an even more intensive control of the regulation of AH and DM2 is needed (25).
Early research in the US from January to May 2020 also showed that patients diagnosed with AH or DM2 or those who had the disease but were undetected were about six times more likely to be hospitalized with SARS-CoV2 and 12 times more likely to die. In addition, older age, other chronic diseases and lower socioeconomic status also increased the probability of a worse course of the disease(26).
In 2020, Mexican researchers who investigated the connection between undetected DM2, a confirmed diagnosis of DM2 and the course of the COVID infection suggested that HbA1c should also be checked in the drawn blood sample of every patient admitted to the hospital due to SARS-CoV2 infection. In this way, we would discover many people who have DM2 but do not yet have a confirmed diagnosis, and this would be useful mainly because of easier prediction of the course of infection with SARS-CoV2(27).
The number of all examinations in 2020-2021 was reduced, but those patients who were diagnosed with a new chronic non-communicable disease during this time were still treated according to the guidelines on the monitoring of their disease. Screening of the general population was significantly less in 2020 and 2021.
A similar study was conducted in the United Kingdom (UK) in 2021, where 15 million patients were monitored between March 1, 2020 and December 10, 2020, during the strictest COVID measures. They compared the incidence of DM2 in the UK, the frequency of HbA1c measurements and the mortality of patients due to DM2. It turned out that in April 2020, from the expected 40 newly diagnosed patients/100,000 inhabitants, the actual number of newly diagnosed patients fell to 12/100,000 inhabitants. In the following months, the number of newly diagnosed patients increased again, but by the end of the year it had not reached the average compared to previous years. At the same time, the mortality of patients with DM2 increased by twofold(28).
DM2 develops over several years, the development of the disease depends on many factors, so it is unlikely that a change in lifestyle during a pandemic will affect the incidence of DM2 in the general population. Assuming incidence remains the same, around 60,000 patients with DM2 were missed or later detected in the UK alone between March and December 2020 according to this survey(28). This figure could be even higher in the coming years due to the general deterioration of the quality of life during the pandemic (increase in body weight due to limited movement, poorer nutrition, increased drinking of alcoholic beverages and the impact on the quality of sleep and psychological stress brought by the feeling of being threatened during the pandemic).

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Science day with health education - experiences of health professionals, teachers and students

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Abstract— **The school environment is key to providing children and adolescents with the knowledge and skills to lead a healthy lifestyle. Members of the multidisciplinary team of the Health Promotion Centre or the Health Education Centre working in health centres play an important role in introducing these important topics. Children and adolescents are interested in personal development and health as they grow up. Health education programme providers (workshops and lectures) are seen as trustworthy among children and adolescents. With a professional approach and interesting content, they can ensure that children and adolescents develop the skills they need to grow up healthy and lead a healthy lifestyle. A descriptive quantitative method of empirical research was carried out. The sample was purposive. Questionnaires were distributed to students, teachers and health education providers in April and May 2023. Students found the most engaging health education content to be 'Instagram' (PV = 4.4, SO = 0.96) and the least engaging health education content to be 'Stop the Bleed' (PV = 3.7, SO = 1.14). The practitioners considered that students showed excellent interest in the topics presented (PV = 4.7), as did teachers (PV = 4.4; SO = 0.5). The topic 'Instagram' was the most comprehensible to students (PV = 4.8; SO = 0.51), while the topic on stopping bleeding was the least comprehensible (PV = 4.2; SO = 0.91). Health education and prevention are important during adolescence and help children and adolescents to foster healthy lifestyles, including in the school environment. The topics are engaging for pupils, presented in a way that motivates children and adolescents to participate. Growing up is a period when children and adolescents acquire new experiences and, consequently, experience hardships along with them. Therefore, it is important to regularly provide health education content that helps children to cope with personal adversity in order to obtain professional, quality information. This will help children to grow up in a healthy way and to foster a healthy lifestyle, which is the foundation for maintaining a healthy lifestyle in adulthood.**

I. INTRODUCTION

In Slovenia, the health education provider for children and adolescents is a registered nurse working at the primary health care level. The National Institute of Public Health (8) develops the basic range of topics, while other topical topics are prepared by the staff of the Health Promotion Centres or Health Education Centres themselves. On average, a registered nurse who is a health education provider enters each classroom at least once during the school year. The role of the registered nurse in Health Promotion Centres or Health Education Centres in Slovenia is to teach about healthy lifestyles. In doing so, they make a significant contribution to improving the healthy lifestyles of children and adolescents or to reducing the emergence and further development of risky behaviours. It links with educational institutions and enters classrooms to empower children and adolescents to adopt healthy lifestyles (9).

Health education for children and adolescents abroad is not the same as in Slovenia. In several European countries, including Spain, Finland, Norway and England, the school system is organised in such a way that educational institutions employ a school nurse to educate children and adolescents about healthy lifestyles and prevention of risky behaviours, and to implement interventions to achieve better health (10) In foreign countries, the school nurse has multiple roles and is employed in an educational establishment and covers the entire health education for one or more educational establishments.

Health-related habits and behaviours developed in childhood are with us throughout our lives, so it is important to instil a healthy lifestyle in childhood, as the introduction and maintenance of healthy lifestyle habits is the best preventive behaviour against the onset of many diseases and illnesses (9).

Despite the fact that adolescence is a privileged period and is generally known as a "disease-free" period, it is nevertheless characterised by certain problematic transformations and transitions. Due to the gradual transition to sexual maturity, teenagers during this period can be more or less confused, which is why Health Education is a compulsory subject in Finland. This course is mainly aimed at talking about growing up, sexuality, and they have a digital learning environment, e-books and videos that are aimed at both health education teachers and students (16).

In Slovenia, health education topics for children and adolescents include: healthy habits, personal hygiene, healthy lifestyles, injury prevention, addiction, growing up, positive self-image and stress, interpersonal relationships, education for healthy sexuality, relationships with the body in terms of cancer prevention, and basic CPR procedures using AEDs, among others (14). It also highlights the need to standardise the delivery of activities, to ensure equal availability and accessibility for all children and adolescents, and to integrate different professional teams to ensure that health education has the best possible preventive effect (14).

In the Health Promotion Centre at the Kranj Health Centre, as part of health education for children and adolescents, providers enter and organise science days with various additional topics in addition to the regular health education workshops. The most common topics are basic resuscitation procedures, stopping bleeding and removing foreign objects from the respiratory tract, social networking, exercise, mental health, sleep and nutrition.

For several years now, providers of health education for children and adolescents have been confronted with the problem of excessive use of information and communication technologies by children and adolescents in primary schools. A survey (1) was carried out in four primary schools among fifth-grade pupils to determine the timing and type of ICT use. The results show that students use ICT for an average of 147 minutes per day. 85% of 15-18 year olds use social networks. There is a clear difference in use, between genders, with boys using it more often than girls. The health system should emphasise the development of safe use of social networks and provide effective mental health support to those who need it Similar to research abroad, new "online" risky behaviours and signs of new forms of addiction are emerging in Slovenia (4). Children and adolescents need restrictions on their use, but unfortunately not all of them do. Excessive use results in inappropriate behaviour of children and adolescents, violence when access to ICT is restricted, lack of exercise leading to obesity, and reduced development of communication skills (3).

Physical activity is one of the most important protective factors for adolescents' mental and physical health (9). Physical activity is one of the most effective ways to manage stress. It is important that young people, who are highly exposed to stressful situations during their education, are aware of this. It would be advisable to further motivate young people, equip them with practical and theoretical knowledge and provide them with quality conditions for physical activity also in the study environment (13). One study (15) found that more than half of the adolescents surveyed are physically inactive. The age and gender of adolescents do not play a significant role in this. The need to raise young people's awareness of the prevention of risk factors for chronic non-communicable diseases is growing every day (15). Adolescents who are active in sport may be exposed to more stress due to frequent training sessions, environmental expectations and lack of free time. All of these factors can also potentially increase their susceptibility to the onset of mental health problems (11).

Kostanjevec et al. (6) found that eighth-graders have satisfactory eating habits, which are associated with regular consumption of at least three meals a day, breakfast, fruit and dairy products. Less satisfactory is the consumption of vegetables and fish, sweet and salty snacks, sugary drinks and fried foods. The authors found that pupils were familiar with healthy foods and dishes and with the basic principles of healthy eating. However, although they have sufficient knowledge about healthy food and eating, they are less attentive to ensuring that the food they eat is healthy (6).

The aim of the study was to find out which health education content is most interesting for students, their engagement during the health education content delivery and the comprehensibility of the content.

II. Material and Methods

The research was based on a quantitative non-experimental descriptive method of work. In the theoretical part, we used the method of reviewing the relevant domestic and foreign literature. PubMed, Science Direct, Research Gate and CINAHL were used for the literature search. Keywords used for the literature search were: health education for children and adolescents, exercise for children and adolescents, social networks, healthy eating.

We asked the following research questions:

Which health education topics are most interesting for students?

What is the engagement of pupils during the delivery of health education content?

What is the students' understanding of the health education content given ?

In the empirical part, the data were collected using a questionnaire addressed to the pupils, the teachers of the primary schools where the health education day was held and the health education providers. In the questionnaire, the pupils rated the comprehensibility of the health education content presented, the interestingness of the health education content and the health education content presented using a Likert scale (from 1-fair to 5-excellent). The teacher questionnaire also included a Likert scale (from 1-fail to 5-excellent), where teachers rated the theme of the science day, the organisation and information, and the participation of the pupils, and we were also interested in the time or duration of the science day. When interviewing health education providers, we were also interested in the organisation and space of the science day, their self-assessment of the preparation and presentation of the health education content, with respondents rating themselves from 1-fair to 5-fair. In the second part, a Likert scale was used to assess the level of agreement on the activities in each class (from 1-do not agree at all to 5-agree completely).

A purposive, non-random sample was used. 220 questionnaires were distributed to pupils, 15 to teachers and 10 to practitioners. 161 pupils, 9 teachers and 10 health education providers were included in the survey.
The survey was carried out in April and May 2023 in a primary school. Statistical analysis of data processing was carried out using Microsoft Excel 2016. Descriptive statistics methods were used to process the data, calculating frequencies, percentages and mean values for each variable.

III. Results

Which health education topics are most interesting for students?

Table 1: Interestingness of health education content according to students

Contents	n	AV	SD
Basic resuscitation	161	4,5	0,85
Stopping bleeding	161	3,5	1,25
New fashion icon - screens	161	4,3	0,96
Instagram	161	4,5	0,76
Positive self-image, stress	161	4,3	0,86
Moving around	161	3,4	1,27

Legend: n = sample size; AV = arrange value; SD = standard deviation; Scale: 1-inadequate, 2-insufficient, 3-good, 4-good, 5-excellent

Table 1 shows how students rated the interestingness of the health education content provided. They rated "Basic CPR" (AV = 4.5, SD = 0.85) and "Instagram" (AV = 4.5, SD = 0.76) as the most interesting content, and "Moving" (AV = 4.3, SD = 1.27) as the least interesting content.

What is the engagement of pupils during the delivery of health education content?

TABLE 2: STUDENTS' SELF-ASSESSMENT OF THEIR PARTICIPATION IN HEALTH EDUCATION

Contents	n	AV	SD
Basic resuscitation	161	4,3	1,08
Stopping bleeding	161	3,7	1,14
New fashion icon - screens	161	4,2	0,97
Instagram	161	4,4	0,96
Positive self-image, stress	161	4,3	0,95
Moving around	161	4,0	1,00

Legend: n = sample size; AV = arrange value; SD = standard deviation; Scale: 1-inadequate, 2-insufficient, 3-good, 4-good, 5-excellent

Table 2 shows the students' self-assessment of their participation during the health education content. They perceived that they participated the most during the health education content "Instagram" (AV = 4.4; SD = 0.96) and the least during the health education content "Stop bleeding" (AV = 3.7; SD = 1.14).

TABLE 3: STUDENTS' SELF-ASSESSMENT OF PARTICIPATION DURING HEALTH EDUCATION DELIVERY COMPARED TO TEACHERS' AND PROVIDERS' ASSESSMENT OF PARTICIPATION

Contents	n	AV	SD
Teachers	9	4,4	0,5
Health education providers	10	4,7	0,49
Students	161	4,15	1,01

Legend: n = sample size; AV = arrange value; SD = standard deviation; Scale: 1-inadequate, 2-insufficient, 3-good, 4-good, 5-excellent

Teachers generally rate student participation with a mean score of AV = 4.4 (SD = 0.5), and health educators with a mean score of 4.7 (SD= 0.49) (Table 3)

What is the students' understanding of the health education content given ?

TABLE 4: ASSESSMENT OF THE HEALTH EDUCATION CONTENT UNDERSTOOD

Contents	n	AV	SD
Basic resuscitation	161	4,6	0,75
Stopping bleeding	161	4,2	0,91
New fashion icon - screens	161	4,6	0,71
Instagram	161	4,8	0,51
Positive self-image, stress	161	4,3	0,95
Moving around	161	4,3	0,97

Legend: n = sample size; AV = arrange value; SD = standard deviation; Scale: 1-inadequate, 2-insufficient, 3-good, 4-good, 5-excellent

Table 4 shows the extent to which students understood the health education content. The most understood topic was "Instagram" (AV = 4.8, SD = 0.51), while the least understood was the topic on stopping bleeding (AV = 4.2, SD = 0.91).

IV. DISCUSSION

In the survey, we wanted to find out which health education content was most interesting to students, how engaged they were during the health education content and whether the content was comprehensible to students.

The study found that the health education content that was most interesting to students was the basic resuscitation procedures, both the lecture and the practical part, and the content on Instagram. One more thing about TPO - they can use as a source a reference to a paper published by Matjaž, he has

mentioned there, besides referring to his findings, also some foreign literature; sure (see introduction)The virtual world is an additional source of information for adolescents about themselves, the changes that are happening to them, a source of information about self-image formation, also about the search for a sexual identity; the virtual world is also a source of information for adolescents about themselves, the changes that are happening to them, a source of information about the formation of a self-image, also about the search for a sexual identity. Through the Internet, they seek and experiment with contacts, while at the same time maintaining existing contacts with their "real" peers. Excessive control or restriction of online contact will only lead to rebellion on the part of the teenager and a loss of valuable, confidential contact. It is precisely because of these considerations that it is necessary to explain to children and adolescents how the use of information and communication technologies can affect their physical and mental health (4). In the secJond research question, we asked the teachers present during the lectures, the providers of health education and the students themselves about their self-assessment of their participation in the health education content. Teachers gave excellent evaluations of the pupils' participation. However, students gave the highest participation score for the content on 'Instagram', which we attribute to the topicality of the content, as most adolescents have contact with social networks. The lowest engagement score was for the content on stopping bleeding (PV = 3.7). We need to be aware that, especially for teenagers, contact with blood is more likely to cause discomfort and, some might say, stigma, so we attribute the lowest average score for the content on stopping bleeding to this fact. One of the most common non-chemical addictions among young people today is internet addiction. Adolescents develop an emotional attachment to online friends and activities they create on their computer screens. Internet addiction also affects other areas of a young person's life, in personal, family, financial and professional spheres. Internet addiction also affects adolescents' relationships with each other, their family environment, friends and work environment (2).

In the third research question, students were asked how they understood the health education content. The most understood content was again about Instagram and screens, which again can be attributed to the topicality of the topic among adolescents. Understanding of the topic of basic resuscitation procedures was also rated as excellent. The Kranj Health Promotion Centre has established good cooperation with educational institutions and set up a system for teaching TPO over the years. In 2014, a new algorithm was created with the Kranj Emergency Medical Unit, according to which lay TPO is taught. It is the "5 Fingers" algorithm, which was also presented at one of the previous Emergency Medicine Congresses. This algorithm is used by 58% of the respondents. Of course, we also use it when teaching lay people. The experience is excellent as it is easy to understand and remember (5). Primary school children who had previously undergone mass education in TPO using an automatic defibrillator had satisfactory knowledge and skills to perform TPO and use an AED. Primary school students are one of the highly motivated and receptive groups of individuals, and they also disseminate this knowledge to the wider local community, including adults (7). Early education of children about TPO is very important and should be introduced as a mandatory part of the health education curriculum already in primary schools. Research shows that adolescents outperform adults in all areas of TPO (12).

Health education and prevention are important during adolescence and help children and adolescents to foster healthy lifestyles, including in the school environment. The topics are engaging for pupils, presented in a way that motivates children and adolescents to participate. Growing up is a period when children and adolescents acquire new experiences and, consequently, experience hardships along with them. Therefore, it is important to regularly provide health education content that also helps children to cope with personal adversity, in order to obtain professional, quality information. This will help children to grow up in a healthy way and to foster healthy lifestyles, which will form the basis for maintaining healthy lifestyles in adulthood.

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Interprofessional collaboration between community nurses and General practitioners in palliative care: a literature review

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***Abstract*— Palliative care in the home environment is becoming an increasingly necessary service in view of the demographic structure of the population and the complex treatment of chronic diseases. The primary palliative care team consist of a community nurse and the family medicine physician. Their good cooperation is an important factor of high-quality palliative care at home. The aim of this review is to discuss the role of community nurses in palliative care provision in primary care settings with a particular focus on interprofessional cooperation in palliative care teams.**

A rapid review of the existing professional and scientific literature was used. The total number of retrieved literature was 410, of which 11 were included in the final analysis. We used the PRISMA diagram and the COREQ checklist to ensure the quality of the included sources.

The effective provision of palliative care requires interprofessional collaboration between community nurses and general practitioners in primary health care. Their role includes cooperation, communication and coordination. Some barriers to effective interprofessional collaboration have been identified, which include a lack of explicit description of each other's roles and tasks and a lack of organizational support. Finally, effective interprofessional collaboration has a major impact on the provision of optimal palliative care and needed to be explored in the future.

***Index Terms*-- community nursing care, palliative team, primary health care.**

I. INTRODUCTION *(HEADING 1)*

Palliative care aims to improve the quality of life of patients and their families facing the problems associated with life-threatening illness (World Health Organization [WHO], 2020). The WHO [1] palliative care atlas indicates that almost 80% of basic palliative care is provided by community nurses and General practitioners and effective interprofessional collaboration plays a decisive role [2]. Given that there are limited specialist palliative services for the care of patients at the end of life, it is necessary to develop and provide palliative care within primary care [3].

European Association for Palliative Care EAPC [4] and [3] emphasize the importance of basic palliative care in the context of primary health care. Palliative care requires interprofessional collaboration of various health professionals based on partnership, integration and teamwork. Collaboration between family physicians and nurses is a decisive element of the quality of palliative care at the primary level [5]. Findings from a review study Reeves et al [6] showed that changes designed to improve interprofessional collaboration can slightly improve practice performance compared to usual care. End-of-life care with a primary-level team allows people to die at home [7] which is not possible without the help of family caregivers, primary-level health workers (GPs and community nurses) and others, such as social workers and home care workers. A qualitative study Oosterveld et al. [8] from the patient's perspective on quality palliative care at home, emphasizes the importance of collaboration between doctors and nurses in outpatient care and highlights person-centered care, a clear protocol and the correct transfer of information between palliative care providers. If there is poor communication between professionals and other services and role confusion, patients may not receive optimal care. Community nurses maybe ideally placed to implement and coordinate palliative care in primary care [9].

This review article delves into the multifaceted role of community nurses in primary care palliative care settings, with a particular emphasis on promoting interprofessional communication and cooperation within palliative care teams.

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II. MATERIAL AND METHODS

A rapid literature review of existing professional and scientific literature was used. We searched the bibliographic databases, PubMed, Wiley, CINAHL, Cochrane from March to May 2023. We used the combination of following keywords: community nurse/district nurse; palliative care; interprofessional collaboration; primary health care. Inclusion criteria were: publications in the last 10 years, quantitative, qualitative research and literature review, freely available text of the article, relevance to the researched topic. For quality

assessment, the hierarchy of evidence Polit and Beck [10] was used. To assess the quality of included qualitative research, the COREQ (Consolidated criteria for reporting qualitative research) 32 item checklist tool was used [11]. The Canadian interprofessional health collaborative framework [12] was utilized as a theoretical framework to identify the concept of interprofessional cooperation according to the 6 domains of the framework.

III. Results

The total number of obtained literatures was 410, with 11 included in the final analysis. The PRISMA diagram is used to schematically display the review process [13].
The search gave 590 articles. After duplicates were removed, 410 articles were screened. 72 articles were then retrieved in full text assessed. The final number of articles left was 11 (Fig. 1). The majority of the studies come from Northern and Central Europe. From study design the qualitative methods dominated. There are included 7 articles with qualitative studies 1 quantitative research and 3 systematic literature review.

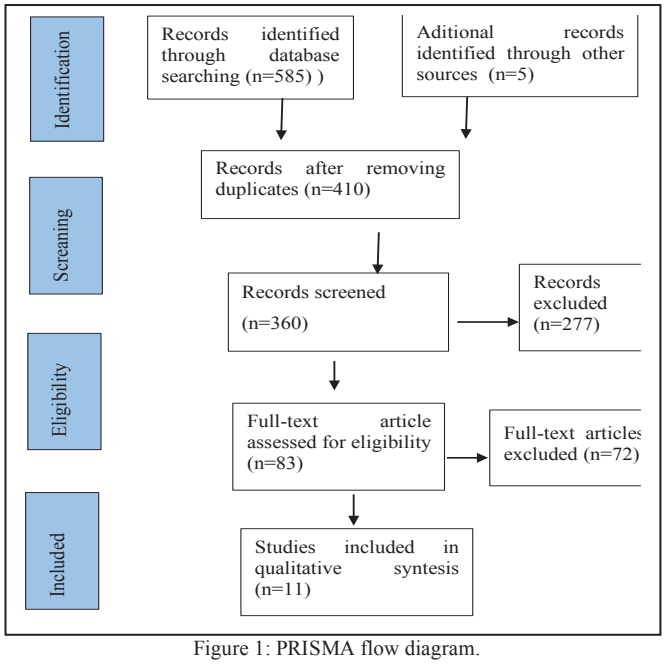

Figure 1: PRISMA flow diagram.

In order to analyze the concept of interprofessional collaboration between the community nurse and the general practitioner in palliative care, we used the Canadian framework with 6 domains. Based on the literature review and synthesis of sources, we want to put our findings in relation to the 6 domains of the Canadian framework.
The framework presents a constellation of 6 interconnecting interprofessional domain which all of them are essential to demonstrate interprofessional collaboration. The domains are: role clarification, patient/family centered care, team functioning, collaborative leadership, interprofessional communication and interprofessional conflict.

Role clarification
In home care nursing, community nurses are often more independent [14]. For community nurse it is crucial that their rolles are accepted and recognized by patients and by the GP [15].
Complex care situations require a higher number of health professionals working together. This collaboration requires precise role profiles and trust in each other's competency [15, 22].
The findings show that a palliative care key person is important for continuous palliative care. The two most frequently represented, in terms of position and function, were the community nurse and the general practitioner [16].

Patient/family centered care
Nurses and GP emphasized that a shared definition of goals, cooperative tasks and responsibilities by development of cooperative team work, would help improve patient care [17].
Organizational changes are needed to ensure that people receive quality palliative care, other health services in their own homes and that are involved in care planning [18].
Clear responsibility regarding communication with the patient and family [19].

Team functioning
Effective and well-functioning teamwork can also act as a source of support to individual nurses [14].
By becoming familiar with each other, team members can start to share experiences and information, build relationship and trust and create shared goals and coherence [14].
Knowledge of one's own tasks and tasks of other services [19].

Collaborative leadership
Professionalization strategies for nursing and the economic transformations of the health care system are two important factors contributing to the persistent problems in interprofessional cooperation [17].
Interprofessional cooperation and this kind of education is important [20].
Leadership and organization, clear roles, expectations and criticality towards one's own role in the team are fundamental [20].

Interprofessional communication
To create a proper climate in which interprofessional cooperation can thrive, are necessary communication training and join discussion [17].
It emphasizes the importance of open communication, informal meetings and conversations about current affairs and the patient's treatment plan, and the possibility of consultation [21].
Early identification of patients according the palliative care, digital documentation, IT communication, the possibility of viewing the patient documentation on all levels of health care [22].

Interprofessional conflict

Negotiations around interprofessional conflict were oriented more toward determining professional status than considering patients' needs [17].
Interprofessional collaboration is very demanding and can be the cause of many conflicts regarding the performance of tasks or in relationships [5].
Communication strategies, shared decision-making and respect for others' opinions reduce the occurrence of conflicts [23].

IV. Discussion

The framework that was used, can offer some direction to achieve inter-professional cooperation to deliver palliative care in community settings in Slovenia. We try to argued some domains as important. There is still work to be conducted in a comprehensive understanding of an interprofessional cooperation in a basic palliative team in the primary health care.

There is one of the most prevalent stereotypes among physicians that they see themselves as "leaders" and "decision-makers" whereas other health-care professionals are considered to be "team players" [2]. The hierarchical relationships that continue to characterize collaboration between nursing and medicine often result in poor communication as well as unresolved conflicts within professional groups [17, 23]. Therefore, for successful cooperation within the team, the professional identity of all team members must be built [17]. Greater emphasis should therefore be given to strategies that would reduce this difference in cooperation, namely strategies to promote the equality of both professional groups [24]. Mitchell et al. [22] found out that after interprofessional education, the competence and autonomy of health workers increased, as well as the understanding of their roles in the team, and as a result, patient care improved. Josi et al. [15] also emphasize, that the role clarification is crucial for efficient interprofessional collaboration.

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Red Code Protocol and experiential learning with simulations – impact on the survival of patients after sudden cardiac arrest in the Community Health Centre Ljubljana

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***Abstract*—Medical teams in primary care deal with a large number of patients on a daily basis, including occasionally endangered patients and those who experience sudden cardiac arrest. Since these situations are relatively rare, they often cause significant stress for medical teams in primary care who may not feel competent to handle such cases. To address this issue, the Red Code Protocol for activating the medical team in case of emergencies was established at the Ljubljana Community Health Centre in early 2014. The teams are adequately equipped and continuously trained in the Simulation centre of the health centre. After the implementation of the Red Code Protocol, all patients who suffered sudden cardiac arrest at the health center were appropriately resuscitated. In addition to effective basic life support procedures, an automatic defibrillator was used in the majority of cases before the arrival of the emergency medical team. The survival rate of patients with sudden cardiac arrest at the Ljubljana Community Health Centre significantly increased after the implementation of the Red Code Protocol compared to the previous period. The continuous experiential learning of medical teams in Ljubljana Community Health Centre units through simulations, along with the establishment of the Red Code Protocol, achieved its purpose: better patient care and increased patient survival after sudden cardiac arrest at the Community Health Centre Ljubljana.**

***Index Terms*—Community Health Centre Ljubljana, Red Code Protocol, cardiac arrest, resuscitation**

I. Introduction

Medical teams in primary health care deal with many patients every day, among whom are occasionally also vitally endangered patients or patients who experience sudden cardiac death. In these cases, proper and rapid initial patient care is critical.

Little literature exists on emergencies and sudden cardiac arrests within primary care offices. International literature on the frequency and types of emergencies is scarce, indicating that emergencies within primary care offices are rare but still occur regularly [1]. In 2022, Melzel et al [1] found in Germany that emergency situations in primary care offices occur on average once a month, more frequently in rural areas than in urban settings. The most common emergencies were acute coronary syndrome, heart arrhythmias, and breathing difficulties. During the observed one-year period, cardiopulmonary resuscitation was performed in 13.9% of primary care offices [1]. A Canadian study showed that two percent of all emergency calls originated from primary care offices due to various emergency situations [2].

Resuscitation in the case of sudden cardiac arrest within or in the immediate vicinity of a primary medical facility should be more successful due to the presence of medical personnel and appropriate equipment. But the rarity of such situations makes it difficult for primary care workers to remain up-to-date and competent in providing life support [3]. The most frequent reason mentioned by primary care physicians as a barrier to not acting appropriately in an emergency situation was a lack of practical skills [4].

However, it is the responsibility of every healthcare worker to know how to respond appropriately and care for an emergency patient. This is especially true for primary health care workers, who are the first contact with a patient seeking help in a health centre.

As a response to the educational needs of more than 1500 employees about managing emergency situations (including sudden cardiac arrest), Ljubljana Community Health Centre (CHC) established a Simulation Centre (SIM Centre) in 2014 [5]. One of the first projects of the SIM Centre was to create a protocol for the activation of a medical team in the event of an emergency in the CHC Ljubljana (Red Code Protocol) [6]. Teams continuously learn and renew their knowledge with the help of experiential learning with simulations in the SIM Centre. There they can not only acquire knowledge and skills, but also learn how to cope with difficult patients, dangerous situations and unexpected events. Learning through simulations

is enhanced with In-situ simulations in real clinical environment [5].

The aim of the study is to determine whether the outcome of patients who experience sudden cardiac arrest at the CHC Ljubljana has improved after the introduction of the Red Code Protocol and implementation of continuous education of staff at the SIM Centre.

II. Material and Methods

Study design: A retrospective analysis of resuscitations in the units of the Ljubljana CHC was performed in the period from January 1, 2001, to December 31, 2022. The study was observational and causal-comparative in nature. The research protocol received approval by Medical Ethics Committee (no. 0120-228/2023/5).

Study setting: Ljubljana CHC is the largest healthcare institution at the primary level in Slovenia. In its current organization, it has eight organizational units with over 1,500 healthcare and other employees. Ljubljana CHC provides healthcare services for the Municipality of Ljubljana and, in certain activities, also for the broader area of neighboring municipalities (emergency medical services). The number of patient visits across all units of ZDL on an annual basis exceeds 2,000,000.

Study population: The study included all patients who underwent cardiopulmonary resuscitation in the units of the CHC Ljubljana or in their immediate vicinity in the period from January 1, 2001, to December 31, 2022. All resuscitations before the establishment of the Red Code Protocol in the beginning of 2014 were classified as BEFORE group and they include resuscitations from the period of 2001 to 2013. Resuscitations performed after the establishment of the Red Code Protocol were classified as AFTER group and include resuscitations performed in the period of 2014 to 2022.

Data collection: The study utilized data obtained from emergency intervention records of the Ljubljana CHC, NMP3000Web of the Ljubljana Dispatch Centre, ambulatory records of University Medical Centre (UKC) Ljubljana emergency department and discharge summaries from hospital wards where treated patients were admitted. Patients for whom medical documentation could not be obtained were excluded from the study. Patients who experienced sudden cardiac arrest in Ljubljana CHC units in the presence of an emergency medical team (EMT) were also excluded from the study.

Primary outcome: The primary aim of the study was to compare resuscitations performed by the medical teams in primary health care before and after the establishment of the Red Code Protocol where we observed the performance of resuscitation procedures, the use of automatic defibrillator (AED) and early defibrillation by health workers before the arrival of the EMT.

Secondary outcome: The secondary aim was to assess the impact of the establishment of the Red Code Protocol on the return of spontaneous circulation (ROSC), discharge of patients from the hospital and neurological outcome of patients at discharge (Cerebral Performance Category – CPC).

Statistical analysis: The study population was divided into two groups: the BEFORE group (period 2001-2013) and the AFTER group (period 2014-2022). Non-continuous data were presented as counts (percentages), and the Chi-square test was used to compare non-continuous data. Continuous data were summarized as the mean (±SD) and compared using Student's *t*-test for independent samples. The computer program IBM SPSS Statistics, version 29.0.0 (IBM Corporation, Armonnk, NY, USA) was used for statistical analysis. A significance level $p<0.05$ was considered statistically significant.

III. Results

In the period 2001-2022 there were 36 resuscitations in the CHC Ljubljana. 22 resuscitations took place in the period before the establishment of the Red Code Protocol (2001-2013) (BEFORE group) and 14 after the establishment (2014-2022) (AFTER group). Three patients experienced cardiac arrest in the presence of the EMT in the period before the establishment of the Red Code Protocol, so these patients were not included in the study.

Demographic characteristics of patients in both groups are listed in Table I. The two groups did not significantly differ in average age; however, there was a statistically significant higher proportion of males in the AFTER group compared to the BEFORE group.

TABLE I: Demographic characteristics of patients in both groups

	BEFORE group (n=19)	AFTER group (n=14)	Statistics *P*
Male, n (%)	7 (36.8%)	12 (85.7%)	p=0.005
Average age (years)	62.7±22.2	59.4±22.0	p=0.668

In both groups, medical causes of sudden cardiac arrest predominated. In the period after the implementation of the Red Code protocol, all cardiac arrests due to medical causes were recorded. Before the implementation of the Red Code protocol, medical causes also prevailed, with the exception of a cardiac arrest caused by trauma (homicide of a healthcare worker and suicide attempt by the perpetrator within the premises of the Ljubljana Health Centre).

The performance of basic life support (BLS) procedures did not differ between the groups, as BLS procedures, with the exception of one patient in the group before the implementation of the Red Code Protocol, were conducted in all patients (see Table II). There was also no significant difference in response times of the EMT between the groups (Table II).

In the second period – after the establishment of the Red Code Protocol, compared to the first period, healthcare workers

significantly more often used an AED (92.9% vs 26.3%; p<0,001) and performed early defibrillation (71.4% vs 21.1%; p=0,004) before the arrival of the EMT (Table II). The first recorded cardiac rhythm was significantly more frequently shockable in the AFTER group compared to the BEFORE group (Table II).

TABLE II: Resuscitation characteristics and response time of the EMT

	BEFORE group (n=19)	AFTER group (n=14)	Statistics *p*
Response time of EMT (min)	6.42±2.4	6.93±2.5	*p*=0.564
Using AED, n (%)	5 (26.3%)	13 (92.9%)	*p*<0.001
The first recorded rhythm shockable, n (%)	4 (21.1%)	9 (64.3%)	*p*=0.012
Performed defibrillation, n (%)	4 (21.1%)	10 (71.4%)	*p*=0.004

ROSC before the arrival of the EMT was achieved more often in the second period compared to the first period (28.6% vs 5.3%) (Table III). In the second period compared to the first period, ROSC was achieved more often (64.3% vs 52.6%; p>0,05), significantly more patients were discharged from the hospital (57.1% vs 21.1%; p=0,033) and more patients had a good neurological outcome (57.1% vs 10.5%) (Table III).

TABLE III: Outcomes after sudden cardiac arrest

	BEFORE group (period 2001-2013)	AFTER group (period 2014-2022)	Statistics *p*
ROSC before the arrival of EMT, n (%)	1 (5.3%)	4 (28.6%)	*p*=0.065
ROSC, n (%)	10 (52.6%)	9 (64.3%)	*p*=0.503
Discharged from the hospital, n (%)	4 (21.1%)	8 (57.1%)	p=0.033
CPC 1 or 2 at discharge, n (%)	2 (10.5%)	8 (57.1%)	p=0.04

IV. Discussion

Primary care workers deal with many patients every day, among whom are occasionally also vitally endangered patients. Wide range of symptoms and rarity of emergency situations, especially of sudden cardiac arrest, makes it difficult for primary care workers to remain up-to-date and competent in managing these patients.

The fact that sudden cardiac arrest is a rare event at the primary healthcare level is evident from the data that, in the last 22 years, there have been 36 cases of sudden cardiac arrest in or in the immediate vicinity Ljubljana CHC. This averages out to 1.6 cases of sudden cardiac arrest per year in the largest primary healthcare institution in Slovenia, which has over 1500 employees. It is clear that a significant portion of healthcare workers at the primary level will not witness or be in a situation to perform resuscitation on a patient in their workplace throughout their careers.

Research has shown that simulations, as an educational technique, result in an increase in perceived competence and confidence in the ability of primary care workers to respond to an emergency [7]. All professionals who are not employed in an emergency department require education for treating patients in life-threatening situation in a safe and controlled environment. There they can acquire the necessary knowledge and practical skills. In addition to that they also learn how to cope with dangerous situations, difficult patients and unexpected events, as well as working as a team leader or a team member [5]. Education with simulations for healthcare workers represents an opportunity to gain additional knowledge and skills without harming the patient. This is how they will be prepared and trained to act correctly in rare but urgent situations, which can determine the final outcome for the patient.

As a response to the educational needs of more than 1500 employees, Ljubljana CHC established a Simulation Centre in the beginning of the year 2014. Healthcare and non-healthcare workers are trained there in managing emergency situations by using realistic simulations.

One of the first projects of the SIM Centre was the establishment of the Red Code Protocol. The Red Code Protocol is the activation of the emergency response team for urgent situations in the Ljubljana CHC unit or its immediate vicinity, which acts quickly and efficiently in case of an emergency. The goal is to ensure a safe environment for the patient in all Ljubljana CHC units by managing acute emergencies with a trained team in the shortest possible time. In the event of an acute deterioration in the patient's condition, the on-duty team begins patient care and continues it until the arrival of the EMT. In the case of a sudden cardiac arrest, this shortens the time to the initiation of BLS and early defibrillation, which has been proven to increase the patient's chances of survival [8].

The on-duty team consists of two members, a doctor, and a nurse. They are equipped with a resuscitation bag containing all the necessary equipment for providing initial managing emergency situations and an AED. The phone number to reach

the team is known to all the staff in the unit and is exclusively used for activating the team.

The team must respond to the call immediately and be with the patient within two minutes.

All teams refresh their knowledge once a year at the SIM Centre, and once a year, in-situ simulations are conducted in each unit. In situ simulations are a type of simulation delivered in a real clinical environment. Participants are situated in their actual workplace and use their medical equipment during the simulation. In situ simulations provide an exceptional opportunity to identify latent safety threats and enhance team collaboration [9].

Such organized team within a primary healthcare institution for responding to emergency situations significantly contributes to prompt and professional intervention, which is of paramount importance for a patient experiencing sudden cardiac arrest.

With the research, we aimed to determine whether the care of patients who experienced sudden cardiac arrest improved after the establishment of the protocol. We also aimed to investigate whether there was an increase in the survival rate of patients who experienced sudden cardiac arrest at the Ljubljana CHC after the implementation of continuous education for healthcare workers and the establishment of the Red Code Protocol, compared to the period before.

In both periods, healthcare workers performed BLS on all patients who experienced sudden cardiac arrest at Ljubljana CHC. The only exception was one intervention in the period before the establishment of the Red Code Protocol, which involved a healthcare worker homicide at the Ljubljana CHC premises. The nurse who witnessed the murder of a healthcare worker and the subsequent cardiac arrest was unable to provide medical help due to an extremely stressful situation.

Unlike BLS, the key difference was the use of AED and early defibrillation. In the AFTER group, an AED was used in almost all patients, with the exception of one intervention involving an infant where the priority was to clear the airway, establish an open airway, and provide artificial ventilation. Therefore, the AED was significantly more frequently used in the AFTER group. The earlier rhythm analysis with an AED before the arrival of the EMT is the reason why the proportion of patients with an initially recorded shockable rhythm was significantly higher in the AFTER group, while the average response times of the EMT did not significantly differ in both groups.

ROSC before the arrival of EMT was several times higher in the AFTER group compared to the BEFORE group, but the sample size was too small for statistical inference.

Statistically significant, there was a higher survival rate of patients until discharge from the hospital in the AFTER group. The proportion of patients in the AFTER group who had a good neurological outcome (CPC 1 or 2) at hospital discharge was almost six times higher compared to the BEFORE group, but here, too, the sample size was too small for statistical inference.

We can conclude that after the establishment of the Red Code Protocol, the management of patients who experienced sudden cardiac arrest at Ljubljana CHC significantly improved. In addition to BLS, which was administered to almost all patients in both groups, an AED was used in almost all patients after 2014. Consequently, more shockable rhythms were recorded, and defibrillation was performed before the arrival of the EMT in many cases. Survival of patients in the AFTER group was significantly higher compared to the BEFORE group.

However, this improvement cannot be solely attributed to the establishment of the Red Code Protocol. Over the last 22 years, we have witnessed significant advances in medical science, both in the prehospital management of cardiac arrest and in hospital treatment.

The fact remains that rapid and professional care of patients experiencing cardiac arrest at Ljubljana CHC has increased the chances of survival for many patients. Numerous studies indeed confirm the connection between immediate resuscitation and early defibrillation in the case of shockable rhythms and the survival of patients after cardiac arrest.

This study also has limitations. The first and most significant limitation is the small sample size of patients who experience sudden cardiac arrest at the Ljubljana CHC every year. This is the reason why, for some results, we cannot draw conclusions with prescribed certainty due to the small sample size.

The second limitation is the fact that increased patient survival after the implementation of Red Code Protocol at the Ljubljana CHC cannot be solely attributed to the establishment of the protocol. However, since it is proven that immediate BLS procedures and early defibrillation increase the chances of survival, it is clear that the protocol implementation has contributed to better outcomes for patients experiencing sudden cardiac arrest at the Ljubljana CHC.

V. CONCLUSION

In the period after the establishment of the Red Code Protocol in the Community Health Centre Ljubljana, medical workers used AED in most cases of resuscitation and performed early defibrillation more often before the arrival of the EMS team. The survival of patients after resuscitation in the Community Health Centre Ljubljana after the establishment of the Red Code Protocol is significantly higher than in the period before. The continuous experiential learning of medical teams in Ljubljana Health Centre units through simulations and the establishment of the Red Code Protocol achieved its purpose – better management and increased patient survival after sudden cardiac arrest in CHC Ljubljana.

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Conference Dinner
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As Aperitivo Restaurant
Dress code: Business casual

GENERAL INFORMATION

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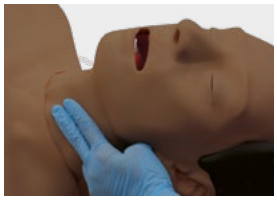

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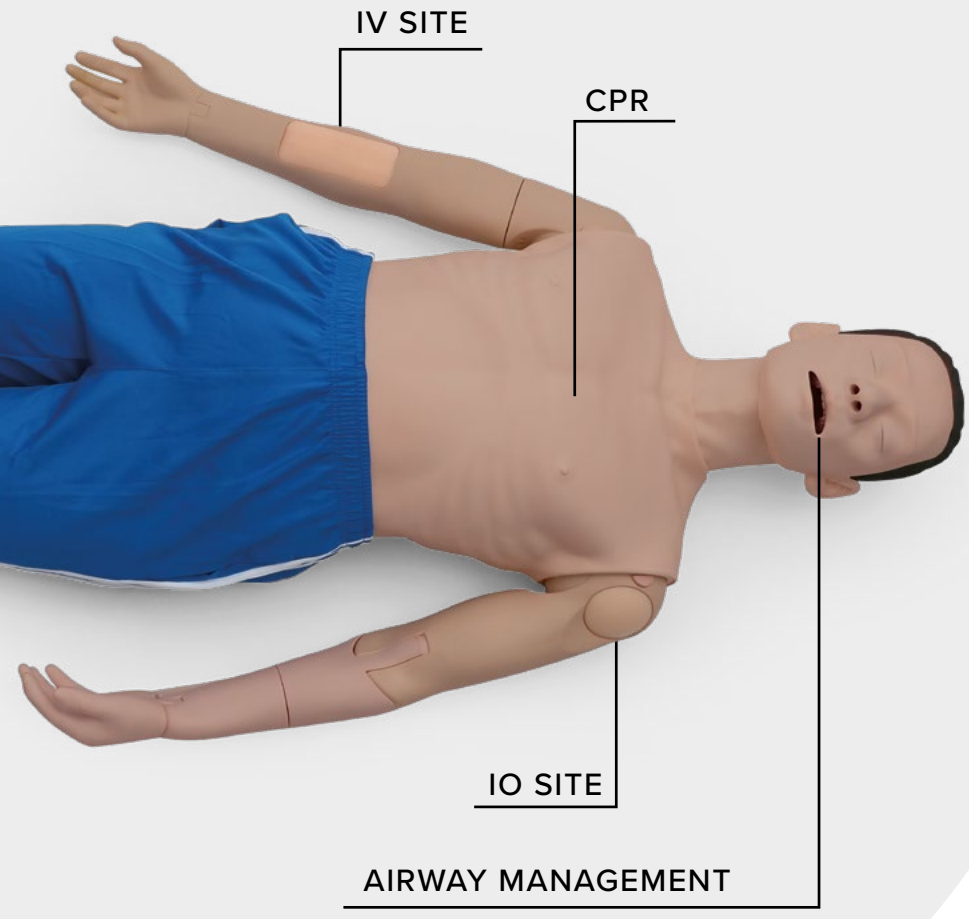

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