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EXPERIENCES OF PRIMARY SCHOOL TEACHERS WITH DISTANCE TEACHING OF PHYSICAL EDUCATION

IZKUŠNJE UČITELJEV RAZREDNEGA POUKA S POUČEVANJEM PREDMETA ŠPORT NA DALJAVO

ABSTRACT

Teaching physical education (PE) at a distance has been a major challenge for primary school teachers because younger students are not yet able to use Information Communication Technology (ICT) independently and their concentration is lower. In order to maintain the development of student's motor skills, it was very important to incorporate various PE games into all distance learning lessons. The aim of this study was to investigate whether primary school teachers conduct PE classes at all in the context of distance education and what constraints and challenges they encounter. The sample included 181 primary school teachers. For data collection, we used a questionnaire prepared and used for the analysis of teaching during the first declared epidemic in Slovenia in March 2020. The data were collected between January 15 and February 15, 2021. The results showed that teachers mostly taught the content of hiking, natural forms of movement, dance, and athletics. Dance was taught by more teachers teaching grades 1 to 3 ($x^2 = 4.731$; g = 1; p = 0.030), and Theoretical Content was taught by more teachers teaching grades 4 to 6 ($x^2 = 19.434$; g = 1; $p < 0.001$). The most common problem in distance education in PE was technological problems and students' lack of knowledge in using ICT. Compared to teachers with fewer years of service, teachers with the most years of service had the most difficulty providing assistive instructional technology (p = 0.001) and knowledge of using digital tools (p = 0.015; p = 0.31).

Keywords: elementary school, remote learning, remote teaching, COVID-19, movement

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IZVLEČEK

Poučevanje predmeta šport na daljavo je za učitelje razrednega pouka predstavljalo velik izziv, saj mlajši učenci še ne zmorejo samostojno uporabljati informacijsko-komunikacijske tehnologije (IKT) in imajo krajšo koncentracijo. Kljub temu so učitelji morali poskrbeti za nadaljnji razvoj njihovih gibalnih sposobnosti, zaradi česar je bilo zelo pomembno, da so v vse učne ure učenja na daljavo vključevali različne gibalne in športne igre. Namen naše raziskave je bil ugotoviti, ali so učitelji razrednega pouka izvajali učne ure športa na daljavo ter s kakšnimi težavami in izzivi so se pri tem srečevali. V vzorec smo vključili 181 učiteljev razrednega pouka, za zbiranje podatkov pa smo uporabili vprašalnik, pripravljen za analizo poučevanja v času prve razglašene epidemije v Sloveniji marca, 2020. Zbiranje podatkov je potekalo od 15. januarja do 15. februarja, 2021. Rezultati so pokazali, da so učitelji v največji meri poučevali vsebine pohodništva, naravnih oblik gibanja, plesa in atletike. Ples je poučevalo več učiteljev od 1. do 3. razreda ($x^2 = 4.731$; g = 1; p = 0.030), teoretične vsebine pa več učiteljev od 4. do 6. razreda ($x^2 = 19.434$; g = 1; $p < 0.001$). Najpogostejši problem pri poučevanju športa na daljavo so bile tehnične težave in pomanjkanje znanja učencev pri uporabi IKT. V primerjavi z učitelji s krajšo delovno dobo, so imeli učitelji z najdaljšo delovno dobo več težav pri zagotavljanju podporne učne tehnologije (p = 0.001) in z znanjem uporabe digitalnih orodij (p = 0.015; p = 0.31).

Ključne besede: razredna stopnja, učenje na daljavo, poučevanje na daljavo, COVID-19, gibanje

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INTRODUCTION

As elsewhere in the world, at least in the first school closure due to the Covid 19 epidemic, preparations for distance education and distance education itself were carried out overnight without adequate notice to all those involved in the educational process. Teaching younger students is a particular challenge in distance education because they cannot (yet) work independently, the youngest cannot read or write, have no computer skills, have a smaller and shorter attention span, and need adult help in almost all areas (Shagiakhmetova et al., 2022).

In particular, the primary school teachers who faced the problem of younger students not being able to work with Information Communication Technology (ICT) , the lower concentration of students, the problem of distance education in different subjects and the requirement that distance education does not follow the traditional schedule, intentionally or unintentionally began to give up or at least reduce teaching in some subjects (frequently also PE) (Rupnik Vec et al., 2020). The authors found that 1/3 of primary school teachers worked with students according to the traditional schedule and 1/4 according to a specially developed schedule that was valid during distance education. In doing so, teachers and school management adhered to the guidelines of the Institute of the Republic of Slovenia for Education, which state that schools must take into account the fact that students need much more time to complete an activity at home than in a school with professional teacher support (ibid., p. 186). Similar recommendations can be found in other sources, e.g. Merrill (2020) and Milman (2020). As a result, students were inactive for an extended period of time, which proved to be a burning issue during the Covid 19 epidemic when student integration was inappropriately lower than pre-epidemic levels due to various constraints. Even during the longer school holidays, students' motor skills decrease (Pavlovic et al., 2021;) and body mass index increases (Moreno et al., 2013). The results (Starc et al., 2020) showed that during the Covid 19 epidemic, motor and functional skills of Slovenian students deteriorated, while the percentage of overweight students and adolescents increased. Burtscher et al. (2020) state that the Covid 19 epidemic severely affected the physical activity of schoolchildren and adolescents. A decrease in the amount and quality of daily physical activity leads to social isolation, weight gain, and an increase in depressive states among students and adolescents. This makes the introduction of PE in distance education all the more important, but unfortunately research shows a less encouraging picture. Research (Pavlovic et al., 2021) shows that American students and adolescents were less active during the epidemic and had fewer hours of PE. In schools where distance education took place, they had the most problems with the implementation of some content, lack of props, and

inadequate space. Indeed, Pietrobelli et al. (2020) note that during the epidemic, weekly physical activity decreased by an average of 2.3 hours. Williyanto (2020) notes that only 15% of teachers taught PE during the pandemic, with 70% achieving cognitive goals, 45% psychomotor goals, and 15% affective goals. He cites the lack of tools for distance education in PE, lack of control over students, lack of knowledge about the use of modern technology, and lack of knowledge about different platforms that can help with distance education.

Distance education in PE is otherwise possible but at the same time there are many shortcomings such as lack of feedback from teachers, lack of motivation and encouragement from students, lack of time to present materials for distance education, inconsistencies between teachers' and students' expectations regarding the performance of assigned tasks and the like (Friskawati, 2021). Similarly, Hambali et al. (2020) suggest that the reasons for less effective distance education in PE are that PE is a very hands-on process, students need immediate and instant feedback on the success of the movement, distance education that requires mutual cooperation among participants (e.g. team games) is not possible, and the implementation of most elements requires direct demonstration, which cannot always be replaced by video.

The primary school teacher teaches all school subjects, and this diversity also brings certain peculiarities of teaching a single subject. In distance education, the peculiarities of teaching each subject are compounded by the problems associated with teaching the youngest students at a distance. During the Covid 19 epidemic, physical activity proved to be even more important than usual in a child's daily routine.

In Slovenia, a larger survey was also conducted among a sample of primary school teachers (Rupnik Vec et al., 2020), but it contained only general questions, while no one has yet looked at the implementation of PE by primary school teachers. Therefore, the aim of this study was to investigate whether primary school teachers implement distance PE at all and what constraints and challenges they encounter. The novelty of our study is the recognition of the most commonly taught content of distance PE lessons among primary school teachers, the most common problems that occur and that can be eliminated or mitigated with awareness, and the differences that occur among teachers of different years of service.

METHODS

The sample of respondents included 181 primary school teachers who volunteered to participate in the survey. The structure by gender was 7 (3.9%) males and 174 (96.1%) females, which corresponds to the ratio in the population of primary school teachers in Slovenia (3.05% males and 96.95% females) and at the same time slightly less than the ratio between males and females in primary schools in general (11.7% males and 88.3% females) (SURS, 2021). The average age of teachers included in the sample was 43.8 years (SD = 9.3; min = 25 years, max = 60 years). The average length of service of teachers was 19.6 years (SD = 10.8: min = 1, max = 40). 130 teachers (71.8%) taught in the first triennium and 51 teachers (28.2%) taught in the second triennium of primary school (4th and 5th grade).

The study protocol was carried out in accordance with the Declaration of Helsinki

For data collection, we used a questionnaire created and used in the analysis of distance education during the first declared epidemic in Slovenia in March 2020 (Rupnik Vec et al., 2020). The questionnaire was partially modified so that it was adapted to the needs of obtaining information about the course of PE in distance education. The original questionnaire contained 39 questions, while the modified questionnaire contained 29 questions divided into 7 sections:

- Demographic questions.
- Instruction in all subjects during distance education.
- PE teaching during distance education.
- Experience of teaching in distance education.
- Implementation of PE in distance education.
- Goals and content of PE.
- Difficulties in the implementation of PE in distance education.

Data collection took place from January 15 to February 15, 2021, using the 1ka online survey tool. The survey took place at a time when distance education had been around for some time and teachers were already experienced with this way of working, but at the same time the situation had calmed down somewhat after the chaotic start of distance education. Two types of questions were used: the optional type with the possibility to freely add the answer in the "other" category, and the 4- and 5-point Likert scale. Through school-based email addresses

and social media, we asked primary school teachers who also taught PE as part of their distance education programme to participate in the survey.

The data were processed using the statistical package SPSS for Windows, version 22.0. To calculate the basic statistical parameters, we used the methods of basic descriptive statistics (calculation of frequencies, structural percentages, minimum and maximum values of responses, averages and standard deviation). At the level of inferential statistics, we used the Chi-Square independence hypothesis test and one-way analysis of variance (ANOVA) with Tukey HSD post hoc test.

RESULTS

Since the beginning of distance education, teachers have received very different instructions regarding the implementation of the pedagogical process (schedule, achievement of goals, methods of testing and evaluation of knowledge). Therefore, we were interested in what learning content was implemented by the primary school teachers in distance PE. The results are presented in Table 1.

Table 1. Implementation of learning content in distance PE classes.

	f	f %	N
Natural forms of movement	179	98.9	181
Athletics	124	68.5	181
Gymnastics	98	54.1	181
Dance	152	84.0	181
Ball games/basketball/volleyball/handball/football	117	64.6	181
Swimming	0	0	181
Hiking	148	81.8	181
Determination and monitoring of motor skills	38	21.0	181
Additional Content	22	12.2	181
General theoretical contents	20	11.0	181

Teachers cited content that is easier to implement at a distance as the most frequently implemented set of topics, such as natural forms of movemet (98.9 %), dance (84.0 %), hiking (81.8 %), athletics (68.5 %) and ball games (64.6 %).

In order to provide teachers with help and support tailored to their needs in the future, we wanted to find out what problems they encountered most often when teaching PE through distance learning. The results are presented in Table 2.

Table 2. Problems of primary school teachers in distance PE teaching.

	Does not apply at all		**Does not apply**		**I cannot define**		**Applies**		**Absolutely applies**		**TOTAL**	
	f	**f %**	**f**	**f %**	**f**	**f %**	**f**	**f %**	**f**	**f %**	**f**	**f %**
I do not have supporting technology available (computer, camera).	78	43.1	49	27.1	21	11.6	27	14.9	6	3.3	181	100.0
I do not have enough space to work / practice.	39	21.5	43	23.8	26	14.3	62	34.3	11	6.1	181	100.0
I am not skilled enough in the use of digital tools for teaching.	33	18.2	71	39.2	25	14.4	47	26.0	4	2.2	180	100.0
I am not skilled enough to plan and deliver PE lessons.	32	17.7	61	33.7	44	24.3	37	20.4	7	3.9	181	100.0
I have run out of ideas on how to teach certain PE content remotely.	23	12.7	63	34.8	35	19.3	53	29.3	7	3.9	181	100.0
The content and goals planned for this period were not appropriate for teaching PE at a distance.	23	12.7	65	35.9	51	28.2	37	20.4	5	2.8	181	100.0
I was not able to reach some students remotely.	47	26.0	53	29.2	11	6.1	61	33.7	9	5.0	181	100.0
The students had technical problems and insufficient knowledge of ICT.	13	7.2	34	18.8	30	16.6	78	43.1	26	14.3	181	100.0

The problems most frequently mentioned by teachers in distance education in PE were technological problems and students' lack of knowledge in using ICT (57.4%), the suitability of their own premises for distance education (40.4%) and the performance of some distance learners (38.7%). Teachers had the least problems with the tools (camera, computer) they needed for distance learning (18.2%).

Because of the characteristics of distance education, which requires teachers to be more digitally literate, we assumed that teachers with more years of service (i.e., older teachers) would have more problems in delivering distance education. At the same time, we assumed that distance PE would be more challenging for primary school teachers teaching in the first triennium because students' literacy skills are generally low. The subjects were divided into three groups according to their length of service. The first category included teachers with up to and including 7 years of service (38 teachers). The second category included those with 8 to 24 years of service (86 teachers) and the third category included those with 25 or more years of service (57 teachers). By their triennium of service, they were divided into teachers teaching in the first triennium (131 or 71.8%) and teachers teaching in the second triennium (51 or 28.2%).

The following are the statements where there were statistically significant differences between respondents in the different groups.

Table 3. Differences in distance PE teaching problems with years of service of primary school teachers.

					Levene's test		ANOVA		
		N	**M**	**SD**	**F**	**p**	**F**	**g**	**P**
I do not have supporting technology available (computer, camera).	1,0	38	1.58	0.95	2.951	.055	6.812	2	.001
	2,0	86	2.05	1.19					
	3,0	57	2.47	1.26					
I am not skilled enough in the use of digital tools for teaching.	1,0	38	2.26	1.13	.413	.662	4.856	2	.009
	2,0	86	2.43	1.06					
	3,0	57	2.91	1.15					
	2,0	86	3.36	1.17					
	3,0	57	3.40	1.16					

Table 4. Differences between the availability of ICT and skills in using of digital tools for teaching over the years of service of primary school teachers.

		Post Hoc test (Tukey HSD)	
		I do not have supporting technology available (computer, camera).	I am not skilled enough in the use of digital tools for teaching.
		p	p
Up to and including 7 years of service	8 - 24 years of service	.101	.718
Up to and including 7 years of service	25 and more years of service	*.001*	*.015*
8 - 24 years of service	25 and more years of service	.083	*.031*

There are statistically significant differences in only two statements, namely, provision of assistive technology and inexperience in using digital tools for planning and teaching distance PE. Statistically significant differences, according to the results of the Tukey HSD post hoc test, in the variable I have not been provided assistive technology (computers, cameras, etc.) are evident between the groups with up to 7 years of service and 25 or more years of service ($p = 0.001$). The youngest teachers ($M = 1.58$) have fewer problems with the assistive technology provided than the oldest teachers ($M = 2.47$). There are statistically significant differences between the teachers with the longest years of service and the other two groups on the variable I am not experienced enough in using digital tools for instructional purposes ($p = 0.015$; $p = 0.031$). The teachers with the longest years of service ($M = 2.91$) agreed with the statement more than the teachers with 8 to 24 years of service ($M = 2.43$), while the group of teachers with up to 7 years of service agreed the least ($M = 2.26$).

However, for teachers who taught in the first and second triennium, statistically significant differences were only evident in the content taught in each triennium, which is shown in Tables 5 and 6.

Table 5. Implementation of dance learning content in distance education according to the triennium of teaching and the value of the Chi-Square test.

			Dance		
			No	**Yes**	**Total**
Triennium of teaching	1	f	16	114	130
		f %	12.3	87.7	100.0
	2	f	13	38	51
		f %	25.5	74.5	100.0
	Total	f	29	152	181
		f %	16.0	84.0	100.0
Pearson Chi-Square = 4.731; g = 1; p = 0.030					

Table 6. Implementation of general theoretical content in distance education PE according to the triennium of teaching and the value of the Hi-square test.

			General theoretical content		
			No	**Yes**	**Total**
Triennium of teaching	1	f	124	6	130
		f %	95.4	4.6	100.0
	2	f	37	14	51
		f %	72.5	27.5	100.0
	Total	f	161	20	181
		f %	89.0	11.0	100.0
Pearson Chi-Square = 19.434; g = 1; p < 0.001					

Statistically significant differences appear only in the subject area of dance, which was taught by distance education by more teachers in the first (87.7%) than in the second (74.5%) triennium ($x^2 = 4.731$; g = 1; p = 0.030), and in the subject area of theoretical content, which was taught by distance education by more teachers in the second (27.5%) than in the first (4.6%) triennium ($x^2 = 19.434$; g = 1; p < 0.001). In the first triennium, the dance set includes simple counting games, dance games, movements of individual body parts and the whole body, imitation of objects, animals, plants with pantomime, which is quite easy to perform at a distance. As expected, the general theoretical content, which is usually taught either during the

PE itself or in the context of interdisciplinary connections, was mainly represented among the teachers of the second triennium.

DISCUSSION

The purpose of presented study was to investigate whether primary school teachers implement distance PE at all and what constraints and challenges they encounter. The study's main findings were that primary school teachers can most easily teach the content of natural forms of movement and dance to younger students through distance PE lessons and that most of the problems in teaching were caused by technology, students' ignorance of its use, and the unsuitability of home teaching facilities. The selection of content for PE in distance education is expected and logical. Content that included more group work (e.g., ball games), more emphasis on safety (gymnastics), accurate placement of measuring stations and instruments (determining and monitoring motor skills), and content related to other spaces and locations (swimming) was implemented less or not at all at the time of distance education. More attention could be paid in distance education to the general theoretical content, which is a compulsory part of the curriculum and the purpose of which is to know and understand the content of sport and the rational perception of sport. However, the general theoretical contents in their place are often not even found in real PE classes, so the answer that these contents were taught by only 11.0% of teachers is actually satisfactory (Table 1). Theoretical contents in PE are most often taught in the classroom itself, and some of them can be well integrated into the teaching of other subjects (interdisciplinary connections). In comparison, Killian et al. (2021) found in their study that distance education was most often taught in dance and individual sports, and Kamoga & Varea (2021) found that in distance PE in Sweden involved a significant reorganisation of the learning content, with swimming lessons completely postponed to a later performance. When implementing the content of distance education in PE, students also have a problem with the safety of performance. Thus, the most common problems were not with PE itself, but with students' ICT skills and, more generally, with the technological challenges we all face in distance education. There were also problems with the space for distance PE and the inability to reach individual students at a distance. On the one hand, the results are surprising as we had unreasonably expected more problems with the qualifications of primary school teachers for distance education (including PE), but on the other hand, they are as expected as the largest proportion of problems with distance education for young students was their lack of

independence and unfamiliarity with the use of ICT. Distance education, or the sudden transition to distance education, caused problems for all participants as they were not prepared for it, nor did they have similar experiences to draw upon in their work. We hypothesized that teachers with more years of service (older teachers) had more problems with using ICT in the transition to distance education, while teachers teaching in the first triennium of elementary school had more problems due to the developmental level of the students.

The results confirmed our assumptions, as these problems occurred differently among teachers with different years of service, with the youngest teachers having the fewest problems with available ICT and the teachers with the longest years of service having the most, which was expected to some extent. Geeraerts et al. (2018) found in their study that older teachers reported learning innovative ICT teaching methods and skills from younger colleagues while supporting them themselves by providing content knowledge and anticipation based on their years of experience. This collaboration was also adopted by some during the Covid 19 epidemic, when schooling moved entirely to distance learning and teachers had to demonstrate all their ICT skills and use of software, digital learning environments, and online tools (DeCoito & Estaiteyeh, 2022). Badia et al. (2017) examined the effects of various demographic factors that might influence their approach to online teaching in a sample of 965 teachers. They found that teachers' age and years of service were important factors in their choice of learning content, collaborative learning, etc. in distance education. In what follows, we looked for differences in all measured variables, differences in teachers' length of service, and differences in the triennium in which they teach. Differences between teachers of different ages emerge on only two variables, provision of assistive technology and inexperience using digital tools for planning and teaching distance education (Tables 3 and 4). The differences arise from the better digital technology of teachers with at least one year of service (the youngest teachers). Similarly, younger teachers (with fewer years of service) are more adept at using ICT than their colleagues with more years of service. As science and technology advance, they enter people's everyday lives more frequently and in different ways, and we can assume that younger teachers - teachers with fewer years of service - are more likely to support change and the adoption of innovations. Therefore, we can assume that teachers with shorter working hours will use ICT more and more skillfully in their daily teaching and thus make the transition to distance learning more easily. The results are in line with expectations, as the research results on digital literacy of teachers in Slovenia also show that older teachers, i.e. teachers with longer years of service, are rated the lowest in digital literacy (Čeh, 20109).

For teachers teaching in the first and second triennium, differences are evident only in the content taught (Tables 5 and 6).

The PE curriculum (Kovač et al., 2011) determines the thematic sections of the taught content. We used all thematic sections for comparison because teachers are autonomous in preparing lessons each year, so it depends on them in which part of the school year they teach individual thematic sections. The same is true for PE at a distance, where teachers taught thematic sections that were planned at the time, or thematic sections suggested by the consultants of the Institute of the Republic of Slovenia for Education, or thematic sections that they believed they could teach at a distance.

The only differences are in the subject area of dance, which was taught by several teachers in distance education in the first triennium (87.7%) and in the subject area of theoretical content, which was taught by several teachers in distance education in the second triennium (27.5%). Dance is the second most frequently selected content for distance education (Table 1). In the first triennium, the dance set includes simple counting games, dance games, movements of individual body parts and the whole body, imitation of objects, animals, plants with pantomime, which is quite easy to do in distance education. As expected, the general theoretical content, which is usually taught either during training or in the context of interdisciplinary contexts, was represented among the second triennium teachers mainly because of the latter (11.0% of all teachers in the sample).

Teaching PE at a distance is very challenging due to the different material requirements of teachers and students, lack of props, difficult direct demonstrations, lack of feedback, and last but not least, student safety (Friskawati, 2021; Hambali et al., 2020; Marshall et al., 2020; Park, 2021). Therefore, only some methods are suitable for distance education, especially when younger students are involved, as distance education represented both an overcoming of physical distance and an unimaginable obstacle to learning, forcing primary school teachers to be even more versatile and flexible (DeCoito & Estaiteyeh, 2022). Nevertheless, the primary school teachers who participated in our study and other teachers (PE teachers, etc.) from other studies successfully overcame this obstacle with different approaches and managed to keep PE at a distance, contributing at least a little to the development of the younger students' knowledge and motor skills. However, our study had some limitations, namely the relatively small sample of individual groups of primary school teachers with different lengths of service, the failure to consider the specifics of students in each class, the availability of ICT among students and

teachers, and the appropriateness of home spaces for implementing different learning contents. Nevertheless, this is the first study that showed the implementation of distance PE by primary school teachers, and the existing literature adds another view on the possibility of distance PE, which could be used by teachers in the future, as in this way students could perform some additional sport and movement content, which would contribute to a better development of students' motor skills.

CONCLUSION

The pandemic COVID -19 has affected the entire school system, and the provision of PE through distance education is no exception. In various studies, authors have found deterioration in students' motor skills, different types and models of distance education by PE teachers, surveyed students, and primary education teachers, but unfortunately, we have not found any study in which the authors address the delivery of PE through distance education under the guidance of primary school teachers. We believe that distance education primary school teachers can do the most in the area of integrating physical activity/sports into a child's daily life because they teach all subjects and are in contact with students throughout the day in this way. Teaching PE at a distance during a class period (45 minutes) is very challenging. The class teacher can integrate the content of PE into the distance education in the form of individual lessons (which last at least 30 minutes), guided active breaks (which last 15 - 20 minutes), a minute for health (shorter 5-minute breaks from sitting for guided physical activities), can teach with the inclusion of movement. All of these activities should be planned and the teacher builds them into the child's school day during distance education, either systematically or as needed (when the student's fatigue, declining concentration, or lack of focus becomes apparent). In this way, we can ensure an appropriate level of daily physical activity in distance education, in line with the recommendations of WHO (2020). The intensity of physical activity is usually lower in distance education because some content cannot be delivered in the home environment.

The management (teaching) of distance PE for younger students must be done with direct demonstration by the teacher. We can also use videos, but the teacher must guide the students in implementing the PE using videos. Feedback is crucial for students, especially younger students need reassurance. Younger students need more guidance, more demonstration, more feedback, so self-study is the exception rather than the rule.

Content suitable for use by PE in distance education is content that does not compromise student safety (e.g., gymnastics content is not recommended), can be performed by students themselves, and can be performed in the home environment. When conducting content that requires the presence of an adult (e.g., field trips, hikes), teachers should provide parents with all necessary information, not only about the content to be conducted, but also about how to conduct it correctly and safely (e.g., appropriate equipment).

So the primary school teacher has a very important role to play in the delivery of PE during distance education, but they need to be aware of this and at the same time this needs to be recognized by others.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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