ORIGINAL ARTICLE

The fundamental motor skills and motor coordination performance of children in West Sumatera Province, Indonesia

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Abstract

Background and Study Aim Good motor coordination is needed to achieve good fundamental motor skills. This study aimed to analyze and describe the relationship between fundamental motor skills and motor coordination performance of elementary school students aged 7 to 9 years old.

Material and Methods The subjects were elementary school students in grades 1, 2, and 3 with a total number of students was 478 (248 male students, and 230 female students) in 8 cities and regencies in West Sumatera, Indonesia. This study used a cross-sectional research design. The fundamental motor skills were examined using the Test of Gross Motor Development-Second Edition. This included assessing locomotor skills (running, galloping, sliding, leaping, hopping, and jumping) and object control skills (striking, catching, throwing, dribbling, rolling, and kicking). Motor coordination performance was assessed by using the Körperkoordinations Test für Kinder including balance beam, moving sideways, jumping sideways, and eye-hand coordination. The data were analyzed by using IBM SPSS statistic version 25.

Results Students in urban areas demonstrated certain levels in Gross Motor Quotients scores, while their counterparts in rural areas achieved marginally higher scores with slightly less variation. In schools where Physical Education teachers were present, students generally scored higher compared to schools without Physical Education teachers, albeit with a bit less variation in the latter. When comparing motor coordination performance, students in urban areas typically outperformed those in rural areas, exhibiting slightly more consistent scores. Similarly, students with access to Physical Education teachers showed better motor coordination performance than those without, though with a somewhat greater range in their scores. A noticeable trend was observed in the Gross Motor Quotients scores of Fundamental Motor Skills, which tended to decrease as age increased. Conversely, students' motor coordination performance generally improved with age. Supporting these observations, the result of the one-sample Kolmogorov-Smirnov test, obtained from Asymp. Sig. (2-tailed), was 0.200 > 0.05. Additionally, the Pearson correlation value between motor coordination performance and fundamental motor skills was 0.633 with a sig value of 0.000, indicating a significant relationship.

Conclusions Based on the study's findings, it is recommended to focus on enhancing motor skill programs for children in rural areas. Schools should invest in Physical Education teachers, especially where they are currently absent, to benefit children. Age-specific programs are needed to address the decline in Gross Motor Quotients with age in children. Regular monitoring and evaluation of these initiatives for children are essential.

Keywords: fundamental motor skills, locomotor, object control, motor coordination performance

Introduction

According to Clark in Korbecki, fundamental motor skills (FMS) enable motor skills to activate large muscle groups, upper limbs, and lower limbs [1]. Moreover, Pangrazi stated that fundamental motor skills construct the basic movement of humans [2]. FMS is the 'ABC' of motion [3]. Then, it is the building block for basic skills to do physical activities or special motor movements in the future [4. 5, 6, 7, 8].

Fundamental motor skills are classified into two groups. The first group is locomotor skills. It involves the movements of body parts from one place to another such as running, hopping, jumping, galloping, sliding, leaping, and skipping. The second group is object control skills. It is referred to as manipulative skills over an object through hands or legs such as kicking, catching, throwing, striking, and rolling balls [5].

Fundamental motor skills cannot develop on their own in accordance with the children's age, yet they have to be taught, and combined with other motions of any physical activities [9]. Li found that fundamental motor skills effectively improved for children aged 3 to 10 years [10]. Fundamental motor skills do not emerge and develop naturally, so they

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need to be taught and included in a structured program in the early years of childhood [11, 12].

To affirm the sufficient development of fundamental motor skills in the early years of childhood, it is obligatory for teachers to teach and improve students' basic movements to the more complex and difficult ones [13]. Motor skills at age 6 had a positive association with leisure physical activities at age 26. These longitudinal studies proved that the importance of mastering basic motor skills of children would have a correlation to their physical activities over the long-term period [14].

One of the factors influencing basic motor skills is regular physical activities [15]. Doing regular physical activities with the correct motions is considered to improve the organ functions of a body and fitness [16]. Previous studies revealed that fitter children had better academic performance than the less fit children [4, 17]. It was assumed that fit children are favorably active and skilful in any physical activities with various motoric experiences.

Numerous studies have shown that children with sufficient FMS development have more skilful motors and are consistently able to do healthful physical activities until they are adolescents [18, 19]. On the contrary, children with lower gross motor skills perform fewer physical activities [20]. It can be proved that children with better motor development will have better achievement than children with lower motor skills [21].

The importance of FMS development for children has been emphasized by policymakers around the world through physical education curricula at schools [22]. However, the importance of basic motor skills and motor experience in childhood has not been appreciated and supported by society, parents, and professionals who work directly with children [23]. In fact, more than half of children do have sufficient FMS competence when they graduate and leave primary school, in the United States [24, 25], in the United Kingdom [26], and in Australia [27]. Another fact is the mastery of basic motor skills in early childhood in Indonesia is low and not in line with their age level [28, 29, 30]. At elementary school age, students' basic motor skills (locomotor and object control) should be almost perfect or already perfect [5].

Motor skills require full development in all periods so the previous experience became the basic development in the next period. Therefore, motor skills are the result of the development process through the students' active participation [31]. Other studies showed that good FMS was supported by the ability to master gross motor skills (i.e., the use of large muscles to move the whole body, and maintaining the balance against gravity and interaction with certain objects) which will later support the specific skills of certain sports [32, 33].

Optimal motor skills are believed to be influenced by motor coordination performance due to the direct manipulation of an object (ball) with the upper and lower limbs. This characteristic brings up the increased complexity factors to contribute to research in motor and coordination competence [34]. Henderson and Sugden stated that the motor competence of somebody to do physical activities such as coordinating fine and gross motor skills to activity completion [35]. According to Faber, motor coordination is a result of performance combination from the quality of muscles, bones, and joints in producing one effective and efficient movement [36]. Pasce Ibara stated that the ability to study in coordination competence is highly recommended for childhood as the central nervous system develops firmly during this time [37].

According to Lych, physical education is the main area of learning in the curriculum focusing on students' motor competence development to participate actively and confidently in physical activities [38]. In order to enhance the quality of physical education learning in elementary schools, physical education teachers should comprehend and master the characteristics of children's development, and the suitable strategies for those children [39]. Gabbard stated over the years elementary schools and physical education have been identified as one of the most influential factors to promote and develop children's FMS and physical activities as well [40].

A research finding revealed that low FMS can be a barrier to learning additional skills and other sequential movements in childhood. Moreover, the high level of FMS will help achieve additional skills in transitional skills as well as more complex skills [41]. It is necessary to understand that it is important to seek a supporting program to improve gross motor skills.

Based on factual conditions in the field, it is important to conduct a study regarding the students' motor competence in West Sumatera, Indonesia. As far as the author is concerned, this issue has not been discussed and reported widely by other researchers it focuses on the fundamental motor skills and motor coordination performance of elementary students. In terms of publication, the findings of this study are expected to be an initial reference for teachers, parents, and principals to analyze the gaps and follow up the progressive action to overcome the pitiful condition of motor skill development in West Sumatera.

Materials and Methods

Participants

The study's population consisted of 478 elementary students (248 females and 230 males) from 1st, 2nd, and 3rd grades across West Sumatera.

These students, aged 7 to 9, were from diverse environments including urban, rural, highlands, lowlands, hills, and coastal areas. They represented 10 public schools in 9 urban/regencies: 26 from Bukittinggi City, 26 from Lima Puluh Kota Regency, 43 from Padang Panjang City, 136 from Agam Regency, 31 from Pasaman Regency, 55 from Solok Regency, 84 from Payakumbuh City, 35 from Padang City, and 39 from Tanah Datar Regency. The sample included students from 4 cities (118 students) and 5 regencies (290 students), with 299 having physical education teachers and 179 without. Headmasters, teachers, and parents have given the approval to collect the data.

Research Design

This study was a quantitative research employing a cross-sectional approach, an observational method to investigate data from a specific population at a single point in time [42]. The focus was on examining the fundamental motor skills and motor coordination performance of elementary students. Data analysis was conducted using the Bivariate correlation method to explore the relationship and contribution between coordination abilities and fundamental motor skills.

For assessing Fundamental Motor Skills (FMS), the study utilized the Test of Gross Motor Development second edition (TGMD-2). This systematic observation protocol involves using two trial videos to measure the gross motor skills of children aged 3 to 10 years. TGMD-2 consists of 12 subskills, divided into two sub-scales: 1) Locomotor skills, including running, galloping, leaping, hopping, sliding, and jumping; and 2) object control skills, including striking, catching, dribbling, throwing, under-rolling, and kicking [43]. Coordination abilities were examined using the Körperkoordinations Test für Kinder (KTK), which includes tests for balance beam, moving sideways, jumping sideways, and eye-hand coordination, as described by Kiphard & Schilling in Matos [34].

Statistical Analysis

In this study, statistical analysis was conducted using IBM SPSS Statistics version 25. The data were analyzed descriptively, focusing on the mean, standard deviation, and correlation to understand the underlying patterns and relationships. A normality test was an integral part of the process, used to assess the distribution of the data. This step determined whether parametric or nonparametric statistical methods were appropriate. In cases where the data did not follow a normal distribution, a nonparametric statistical test was employed.

Results

Fundamental Motor Skills and Motor Coordination Performance for Male and Female Students

Data analysis in general showed that the mean of Gross Motor Quotient (GMQ) of 478 students was low, the mean of students' locomotor skills was average, and the mean of students' object control skills was low. In addition, comparing to female students, male students had better performance with the mean of fundamental motor skill in below average level while the mean score of female students was low. On the other side, the mean of students' motor coordination performance was generally in average level. Both male and female students obtained almost the same scores in average level. The descriptions of the FMS and motor coordination data can be seen in Table 1.

Furthermore, result of data analysis indicated that the mean of 478 students (general, male and female students) based on Gross Motor Quotient (GMQ) in locomotor and object control skills was classified into seven categories such as very superior, superior, above average, average, below average, low and very low. These categories are presented in Table 2.

In terms of motor coordination performance, it was revealed that the mean score of 478 students was seen from general, male and female students. Each of result was classified into seven categories starting from very superior into very low. The data description is presented in Table 3.

Fundamental Motor Skills and Motor Performance based on School Locations (Urban and Rural Areas) and the Existence of Physical Education Teachers

The result of the data analysis showed that there was no significant difference between students in urban areas and those in rural areas in performing fundamental motor skills. However, male students obtained higher mean of Gross Motor Quotient of than female students. Furthermore, students who studied with physical education teachers had

Table 1. General description of FMS and motion coordination data obtained

Group	N	Fundamental motor skills					Motor coordination				
		Average	Std	Min	Max	Rating	Average	Std	Min	Max	Rating
General	478	78,68	10.7	52	137	Low	13,94	3.1	6	22	Average
Male	248	81,67	10.4	55	109	Below Average	14,63	3.2	6	22	Average
Female	230	75,30	10.4	46	137	Low	13,19	2.9	6	22	Average

Table 2. Results of gross motor quotient FMS, general, locomotor, object control (male & female)

Gross motor	FMS			Locomotor		Object Control		Descriptive
Quotient	General	Male	Female	Male	Female	Male	Female	Rating
> 130	0	0	0	0	0	0	0	Very Superior
121 - 130	1	0	1	1	0	0	0	Superior
111 - 120	0	0	0	24	4	0	0	Above Average
90 - 110	76	53	23	145	98	21	17	Average
80 - 89	117	73	44	52	75	88	46	Below Average
70 - 79	182	86	96	24	46	81	98	Low
< 70	102	36	66	2	7	58	69	Very Low

Table 3. Result obtained motor coordination, general, male and female

Scores motor Coordination	General	Male	Female	Descriptive Rating
> 20	14	9	5	Very Superior
18 - 20	39	30	9	Superior
15 - 17	153	97	56	Above Average
12 - 14	170	73	97	Average
9 - 11	80	28	52	Below Average
6 - 8	22	11	11	Low
< 6	0	0	0	Very Low

Table 4. Average achievement of FMS and motor coordination between urban, rural and school students with PE teachers and without PE teachers

Group		Fundamental motor skills					Motor coordination				
		Average	Std	Min	Max	Rating	Average	Std	Min	Max	Rating
Urban	General	78.34	11.4	46	109	Low	14.42	2.9	8	22	Average
	Male	81.18	10.6	55	109	Below Average	14.9	2.8	8	21	Average
	Female	75.11	11.4	46	109	Low	13.88	2.8	8	22	Average
Rural	General	78.77	10.5	52	109	Low	13.62	3.2	6	22	Average
	Male	82	10.2	55	106	Below Average	14.45	3.4	6	22	Average
	Female	75.4	9.7	52	109	Low	12.8	2.9	6	22	Average
PE Teacher	General	80.41	10.9	46	127	Average	14.25	3.2	6	22	Average
	Male	83.85	9.7	58	109	Below Average	15.01	3.2	6	22	Above Average
	Female	76.61	10.9	46	127	Low	13.42	3.1	7	22	Average
Teacher	General	75.58	10.1	55	106	Low	13.41	2.9	6	22	Average
	Male	77.90	10.5	55	106	Low	13.98	3	7	22	Average
	Female	73.13	9.1	55	106	Low	12.83	2.6	6	20	Average

bigger mean of Gross Motor Quotient score than those who studied with non-physical education teachers. In comparing of rural and urban areas, coordination motor performance of students in urban area was higher than those in rural area, and it was also seen that the higher score was obtained by school who had Physical Education teachers. Unlike students in urban area who had better motor coordination performance, students in rural area performed better fundamental motor skills, and they also obtained higher score when studying with physical education teachers. The data descriptions are presented in Table 4.

Students' achievement of fundamental motor skills is displayed in histogram in Figure 1. It can be revealed that the highest performance of fundamental motor skills was in average level followed by very low and below average levels for

students in urban and rural areas, and students studied with physical education teachers and non-physical education teachers. Moreover, students' performance in motor coordination is presented in histogram in Figure 2. It can be tailored that the highest achievement was in superior level followed by average and above average levels.

Further data revealed that students in 7-year-old group were better at achieving fundamental motor skills than those in 8 and 9-year-old groups. The mean Gross Motor Quotient of students in 7-year-old-group was 81.1, that of students in 8-year-old group was 78.79, and that of students in 9-year-old group was 76.79. In terms of motor coordination, students in 7-year-old group was lower (12.57) than those in 8-year-old group (14.02) and those in 9-year-old group (14.90). The data description is presented in Figure 3.

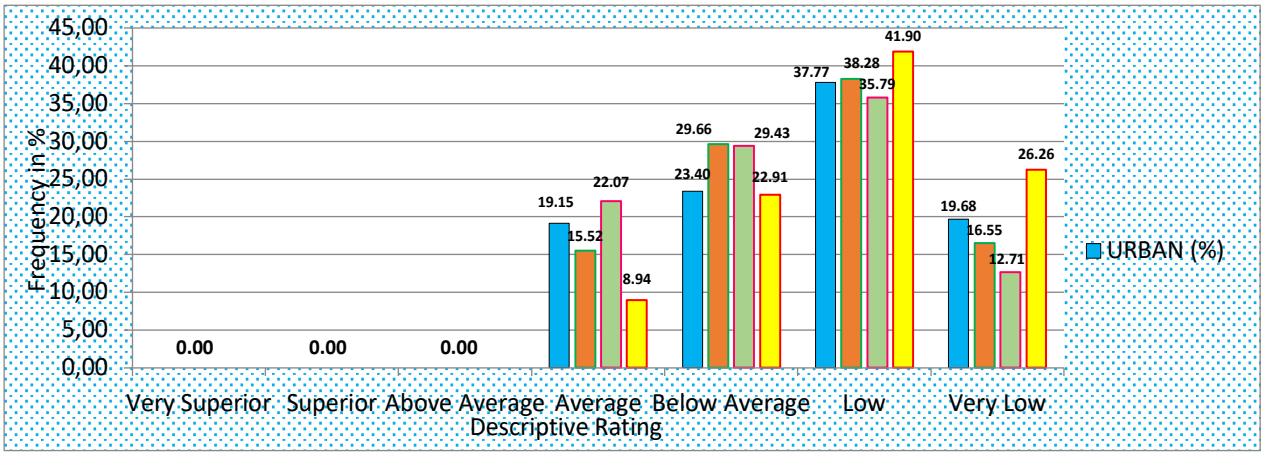

Figure 1. Comparison of average coordination between Urban, Rural students, PE teachers & general teachers

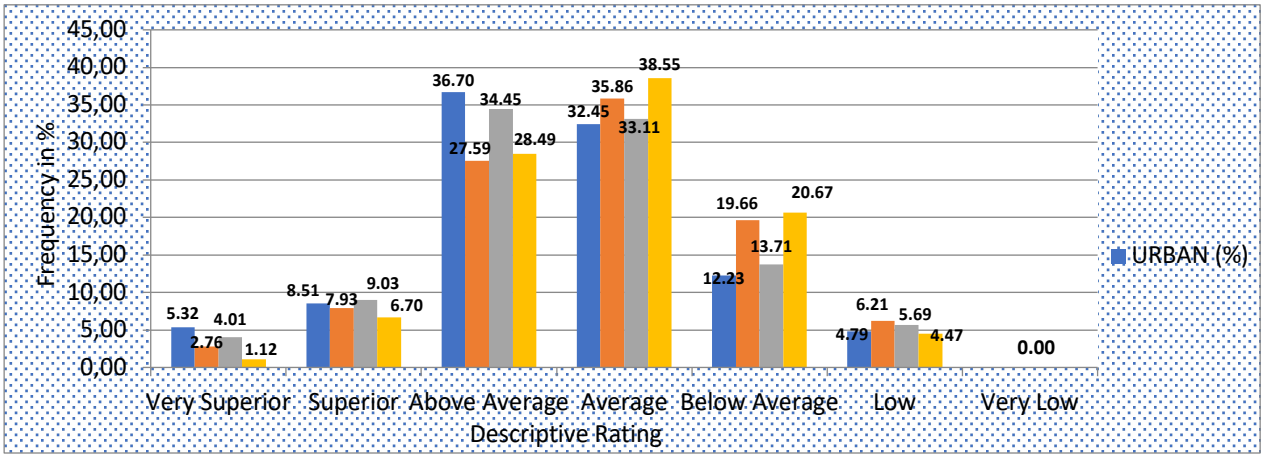

Figure 2. Comparison of average coordination between Urban, Rural students, PE teachers & general teachers

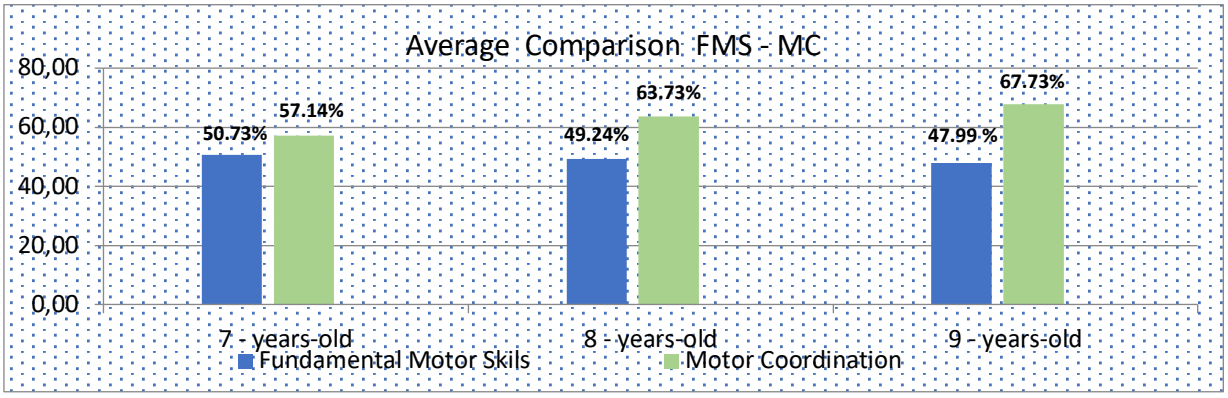

Figure 3. Comparative description of average FMS and coordination aged 7, 8 and 9 year

Normality testing was conducted by using the one-sample Kolmogorov-Smirnov test Asymp. Sig. (2-tailed) 0.200 > 0.05 of Statistic IBM SPSS version 25. Then, for the Bivariate correlation test, the result showed that the Pearson correlation test was 0.633 and the significant value was 0.000. It can be concluded that there was a significant relationship between motor coordination performance and fundamental motor skills of elementary students in West Sumatera. It can be also revealed that there were relationships and contributions of each group (Urban, rural, PE teachers, non-PE teachers) with the motor coordination performance and FMS. The correlation score of motor coordination performance and FMS for students in urban areas was 0.627 and the contribution score was 39.27%. The correlation score of motor coordination performance and FMS for students in rural areas was 0.564 and the contribution score was 42.76%. The correlation score of motor coordination performance and FMS for the PE teacher group was 0.628 and the contribution score was 39.41%. The correlation score of motor coordination performance and FMS for non PE teacher group was 0.618 and the contribution score was 38.24%. These data showed that there was a high correlation between coordinator ability and FMS of Elementary students in West Sumatera, Indonesia.

Discussion

This study revealed the factual condition of fundamental motor skills and motor coordination performance of Elementary students in West Sumatera. The researcher analyzed students' general competence in terms of gender, the location of the schools (urban or rural), and the existence of Physical Education teachers. Furthermore, the analysis was conducted to see the FMS and motor coordination performance of students in groups ages 7, 8, and 9. The result showed that there was a positive relationship between FMS and motor coordination performance. The more motor coordination performance students have, the higher the score of GMQ students get. It can be references to construct the hypotheses for deeper research, arrange the programs and learning models, and decide the policies and regulations in physics education.

Fundamental Motor Skills

The result of data analysis showed that there was no GMQ score in superior level, and above average level. The findings were that 21.34% of students were in very low level; 8.11% of them were in low level; 24.63% of them were in below average level; and 16% of them were in average level. None of them was in above average, and only 0.21% of them in superior level. It can be tailored that in general students' FMS was low, but the male students performed better than the female students did in the locomotor and object control skills. According to TGMD-2 rules, from 478 students observed, only 5 of them had basic motor development corresponding to their age level. Meanwhile, other 473 students, had motion delays including 80.02% delayed development of locomotor skills, and 98.95% delayed development of control object skills.

The male and female students had higher scores in locomotor skill assessment, but they got very low scores in object control skill tests. According to Goodway students at the Elementary level should perform very superior basic motor skills such as locomotor and object control skills [5]. However, the findings in the field revealed that their skill performance was in very low level. In line with the previous studies, the result showed that elementary students had low competence of FMS [44, 45]. Whereas a study argued that high FMS competence would increase skill development of transition ability and complex motor ability [41].

Other findings showed that students at the age of 7 years old had better motor skills than those at the age of 8 years old, and declined in the age of 9 years old. This result rebutted the assumption that FMS development was not in accordance with age development. It was also supported by Pang, Goodway, and Valentini. Rodrigues in his study figured out that children between the ages of 6 and 9 years old dealt with delayed development of their motor skills compared to the expected ideal development. Children's development in the age of 6 years old was in lower category, and that of 9 years old was in very low category. These results can be interpreted that the children may be prevented from further physical ability due to a lack of basic motor skills [31].

Students studying in rural areas had better average scores than those studying in urban areas, especially in locomotor skills. However, female students in urban and rural areas had almost the same competence in those two skills, but it was still lower than the male students. This finding was in line with a study conducted by Duarte, et. al. that lifestyles, environments, and habits of rural society in doing physical activities were beneficial for students to build and develop locomotor and control group skills. Furthermore, male students had higher intensities and mobilities of physical activities than female students did [46]. Since male students were dominated in physical activities, Melvin et. al. suggested giving more opportunities to female students in order to optimize the materials [47].

Students who studied in rural areas had higher locomotor skills than those who studied in urban areas. Nevertheless, for object control skills, students in urban areas got higher scores than students in rural areas. These findings are in line with the result of a study conducted by Bakhtian,

physically students in rural areas actively moved such as walking to school so that they build good motor skills, meanwhile, students in urban areas were better at manipulative skills since they could afford the equipment's effortlessly [48]. Moreover, Budi et al stated that students got low motor quality due to the limited time allocation for sports subjects, and no time was adequate to hold the physical activities outside the class [49].

Grunseit suggested that teachers in urban areas should have classroom innovation to manage the limitation of physical activities so that it can effectively improve the locomotor skills of students [50]. To implement this idea, Papadopoulos et al figured out that the integration of short breaks to do physical activities can increase students' motor skill quality, and confidence, and specifically contribute to students' well-being to improve their FMS as well [51]. Doing physical activities through games also lead to a direct positive effect in upgrading students basic motor skills as it is applied in physical education learning at school [52].

There was also a finding related to the existence of physical education teachers to gain better scores than the non-physical education teacher did. Firstly, Salters et. al. believed that physical education teachers were more competent in demonstrating and experiencing movement and strategies, and were able to combine materials to improve students' FMS [53]. Secondly, da Silva stated that a well-structured subject would likely achieve better motor competence as the teacher should optimize the intervention in developing students' FMS [54].

In accordance with the analyses of the four groups in this study, the highest score of FMS was obtained from students who studied with physical education teachers. In other words, one way to boost students' motor skills was to advance physical education for students at school. Bolger et. al. stated that the physical activities of male and female students were determined by social and environmental factors such as family, peers, teachers, and physical environment [55]. Moreover, FMS competence was acquired through a combination of active performances and structured exercise programs designed by the teachers or coaches [7]. It was also recommended to have quality physical education that equipped students with a variety of appropriate physical and fitness exercises using effective learning strategies to exaggerate time learning and students' participation in physical education courses [56, 57].

Physical education teachers are the dominant alternative that plays an important role in developing and improving students' competencies through physical education at school. Equipping teachers with FMS skills and knowledge is an effort to enhance students' motor skills [58]. Physical Education teachers also need to understand students' developmental levels to figure out the legitimate approach that suits students' needs in FMS learning. Locomotor and object control skills evolve through the 'level' process which means a development process with certain development indicators. Generally, there are three to five levels of locomotor and object control skills. The understanding of basic motor skills will be useful for teachers to teach basic movement to students [5].

Samodra et. al. admitted that there were differences between the FMS of students living on the coasts, and the FMS of those living mountains, so a deeper analysis was needed to create FMS material for Elementary students [59]. In response to this finding, some interventions were implemented and succeeded in physical education programs at schools. FMS-based Afterschool program was successfully and effectively proven to promote FMS and physical activities for students at school [60]. Bardid claimed that Multimove intervention for children aged 3 to 8 years old was effective in increasing students' FMS in the school environment [61]. Bryce also stated that the implementation of motor intervention for 60 minutes a week in the Health and Physically Active School (HEPAS) program significantly improved students' motor skills [62]. Moreover, Yudanto et al applied some learning models to students who have high and low FMS scores toward the motor and psychosocial of soccer students. The results showed that the models were effective for students with high FMS scores [63]. Therefore, it is highly recommended that teachers manage to find suitable strategies to teach FMS effectively.

It is important to optimize the progress of Physical education through qualified teachers in realizing FMS learning at school. More than one approach and method can be used for certain materials and outcomes. Moreover, it is necessary to design relevant strategies focusing on the importance of FMS in elementary schools as an alternative way regardless of the low FMS score that will possibly limit students' physical activities [40]. Teachers' competence is also crucial in evaluating, and understanding the motoric level of students in order to make it easier to assess and implement FMS in the classroom. Some authors argue that the suitable learning model to use for elementary students is game-based learning [64]. Nopembri admitted that physical education with cooperative learning in game-based learning would increase problem-solving ability and cope with stress simultaneously [65]. This model can be used to develop students' FMS and it is recommended to implement game-based learning to have effective learning.

Motor Coordination

The data analyses revealed that in general

students' motor coordination performance was in average level. Of 478 students, no student was in very low level, but 22 students were in low level. Only 80 students were in below-average level, and 170 students were in average level. there were 153 students in above average level, 39 students in superior level, and 14 students in very superior level. This study investigated the same students and compared their FMS and motor coordination performance scores. The result showed that good motor coordination performance tended to have high GMQ scores in FMS.

This study also examined the correlation between motor coordination performance and the result of the GMQ scores from the FMS test. It can inferred that the higher the students' motor coordination performance, the better the students' FMS performance. Barnet in Matos et. al. stated that one of the important aspects of the relationship between motor coordination performance and FMS was to have good motor performance, people need to have good coordination competence [34]. This finding is in accordance with the previous studies that the male students performed better coordination than the female students did, and it mostly affected the object control skill of the students. The male students ages 6 to 10 years old were superior in motoric coordination assessed with eye-hand coordination motoric from Faber [66]. It is assumed that male students are dominantly mobile themselves to take opportunities and explore movements to support their coordination.

Both male and female students in these sample groups showed different motor coordination performances in terms of age. The students' coordination movement will increase in line with the age development. Students at the age of 9 years old had better coordination than those at the age of 7 and 8 years old. Basic physiology and motor coordination were the coordination of nerves from its system [67]. Regardless of exercise intensity it was believed that older students had optimum neural systems. Students in urban areas had the highest motor coordination performance among students in rural areas, and two more samples. However, the highest coordination skills were obtained by male students studied with physical education teachers (average level). It can be implied that students in urban areas had more opportunities and facilities than students in rural students had [48]. The chances will be greater when the learning process is structurally facilitated.

There was a positive and significant relationship between motor coordination performance and FMS, so it is suggested that teachers necessarily provide more exercises related to coordination to the students. In other words, the higher the coordination score of students, the better the performance of FMS students. According to Bojwokski, the improvement of coordination motor skills is one of the most important factors in achieving learning goals [68]. Based on the theories above, motor coordination performance is the key to obtaining the competence of specific movements, especially if it is used in competitions and tournaments.

According to Vandorpe, coordination exercises in the early year of childhood is one of the factors to determine the competence and skills of students or athlete in any branch of sports tournament [69]. By doing bilateral coordination exercises for 10 minutes regularly, students' concentration and attention will focus rather than doing normal physical activities in the same duration [70]. Therefore, movement coordination contributes intrinsically to developing students' motor skills and concentration.

Regarding the explanations above, it is necessary to make a serious effort to build up students' fundamental motor skills in West Sumatera Province, Indonesia. First, the improvement of the physical education learning model is the most feasible solution as it is supported by previous studies that the interventions effectively improved the FMS of elementary students and young children. It is also important to manage some exercises related to movements and to program the relevant physical activities by the physical education teachers. Related findings revealed that there was a significant relationship between motor coordination performance and FMS score as empirical proof to be considered. It can be inferred that to enhance students' FMS significantly, their motor coordination performance should be developed through structured and unstructured physical activities inside and outside the classroom.

Lawson et. al. mentioned two valuable aspects of building students' competence; they are stability skills and coordination skills [71]. In addition, Han stated motor skills reflect the criteria of basic physical activities which can improve motor skills and maintain the physical and mental health of elementary students [72]. Johnson et. al. also suggested that physical education teachers construct proper interventions which equip students' needs based on their own characteristics to boost their FMS [73].

Conclusions

The results of this study lead suggestions to do interventions in optimizing physical education in elementary schools. Considering a variety of students' needs, it is advisable for physical education teachers to construct effective learning models to improve the basic motor skills of students. Additionally, incorporating unstructured physical activities alongside regular assessments can further aid in the holistic development of students' motor abilities.

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Conflict of interest

There is no conflict of interest

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