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# Fundamental Motor Skills of Kindergarten Students (A Survey Study of the Influence of Financial Condition, Playing Activity, and Nutritional Status)

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**Abstract.** Fundamental motor skill is still one problem by Kindergarten at Subdistric of Padang. It was seen from preliminary research data 37.92% of Kindergarten students can't do locomotors movement, non-locomotors and manipulative. Some factors allegedly influence fundamental motor skills were financial condition, playing activity, and nutritional status. The research purpose was to know: a causal relationship between endogenous variable was fundamental motor skills, intervening variable was nutritional status. Two exogenous variables were financial condition and playing activity. The research method was survey method and analysed by path analysis. Population was all Kindergartens at Subdistric of Padang Utara. Samples were 7 Kindergartens that represent each village. The results concluded that: 1) Financial condition positive directly influenced toward motor skills ( $\beta_1 = 0,22$ ), 2) Playing activities positive directly influenced toward motor skills ( $\beta_2 = 0,374$ ), 3) Nutritional status positive directly influenced toward motor skills ( $\beta_3 = 0,161$ ), 4) Financial condition positive directly influenced toward nutritional status ( $\beta_{31} = 0,213$ ), 5) Playing activities positive directly influenced toward nutritional status ( $\beta_{32} = 0,171$ ), 6) Financial condition indirectly influenced toward motor skills ( $\beta_{12} = 0,752$ ), 7) Playing activities indirectly influenced toward motor skills through nutritional status ( $\beta_{23} = 0,943$ ).

## 1. Introduction

Movement is a nature of life and it is changed by time which could be observed from the human's birth to adulthood. From the free, gross, and random movements changed into meaningful, soft, well-organized movements. There are so many types of movement that needed to be learned and trained based on one's need, development, and the social norm. Directly, children's physical development will determine their movement skill whereas indirectly children physical development affects their self-assessment. The physical development related to the motor development which involves the development of controlling physical movement through nerve center, nerves, and coordinated muscles.

There are two components of children movement ability that needed to be developed including fundamental and fine motor skills aspects. Fundamental motor skills is a movement used big muscles such as walking, running, two legs jumping, and hopping the obstacles. On the other hand, fine motor skills is a movement used small muscles such as cutting, sticking, tearing, drawing, coloring, writing and arranging the blocks. Each child has different motor ability.



Some children have a good fundamental motor ability; however, some children do not. As a matter of fact, the children who lack of fundamental motor skills (FMS) such as locomotors and non-locomotors movements can be given trainings including jumping, climbing, running, and walking. Whereas, the children who lack of fine motor ability can be trained through the trainings of folding, forming, etc. In general, the differences between fundamental and fine motor skills can be seen through its coordination and biomechanics. FMS are the building blocks to future physical activities and sport and are the movement equivalent to the ABCs in reading literacy. FMS consist of two groups of skills including locomotors and manipulation skills. Locomotors skills are skills such as running, jumping, hopping, leaping, sliding, galloping and skipping, in other words a child moves his/her body from one point to another [1].

The fundamental motor skill needed to be developed since it will affect their other developments involving physiology, cognitive, and socio-emotional. Also, socio-economic factor has an influence toward the children's gross motor ability. By having an established financial condition, the children's nutrition will be fulfilled. In developing the children's gross motor aspect in kindergarten education, it is hoped that kindergarten adjusted the curriculum to the factors which affect the children's gross motor aspect so that the children's gross motor can be easily improved. Factors affecting the development of the movement, among other things, genetic, environmental stimuli, and nutritional status [2]. To allow for optimal development, required the development of broad and balanced between the physical aspects of motor skills, intelligence, emotional and social development [3].

The result of observations done at Jannatul Ma'wa and Dharmawanita UNP kindergarten, it is found that there are several students who are lack of ability in doing three movement components involving locomotors, non-locomotors, and manipulative. This fact is in line with the researcher's research in 2010 about the status of kindergarten's students gross motor. The result is 5.06% of the students' gross motor skill is in very poor category, 13.92% is in poor category, 22.15% is in adequate category, 37.34% is in good category and 21.52% of them are in very good category. From the observation, it is found that the students seem lazy in doing physical activities. The findings from this study reveal that lock skills of children in rural areas were significantly better than children in urban areas. It may be that the rural environment provided greater opportunities for children to be physically active than the urban environment [4].

The researcher assumed that it is because of the students' weak condition, lack of nutrition intake, and unfamiliar with the activities either in school or home. Other phenomenon that can describe the children' condition today is the parents who limit the children's movements at home. Also, the presence of play station, online game, and smart phones decreased the students' physical movements. Based on those phenomena, observations, experiences, and expert's opinions, it is found that there are several factors which affect the children's fundamental motor skill involving social-economic condition, parents' education background, playing activities, and nutrition status. The aim of the research is to find out the financial condition factor which focuses on economic stability. Also, it aims to find out the playing activities which focus on children nutrition status in affecting fundamental movement skill.

## 2. Research Methods

The research design is a survey research method by using causality technique. The first variable is called as *endogenous*, which is the fundamental movement skill of kindergarten's students (Y). The second variable of is called as *intervening*, which is the children's nutrition status ( $X_3$ ). The two other variables are included into *exogenous* variables which are social-economic condition ( $X_1$ ) and playing activities ( $X_2$ ). The data is analyzed by using statistic with *path analysis* technique. Path analysis model is implemented to analyze the relationship among variables in order to find out the direct and indirect influences of exogenous and endogenous.

Population of the research is all of kindergarten's students in North Padang district. In order to determine the sample of the research, the researcher used cluster sampling where each kindergarten has an equal probability to be chosen. Thus, one kindergarten at each sub-district will be chosen as the

samples. The technique of data analysis in this research is by using: (1) descriptive statistic which describes the data obtained, (2) analysis requirements test involving linear test and normality test by using *lilliefors*. (3) Correlation statistic which gives scores for each variable and correlated it into other variables. (4) Path analysis which analyzes the relationship among the variables.

### 3. Results and Discussion

Normality test was used to determine the normality of each variable. It could be said as normal variable if  $L_{count} (L_0)$  is smaller than  $L_{table} (L_t)$  by using formula:  $([F(z_i) - S(z_i)])$ . The following table is the result of normality test by using *lilliefors* where its significance is  $\alpha=0,05$ .

**Table 1.** Analysis of normality test (n=155)

No	Error estimates of regression	$L_{count}$	$L_{table}$	Result
1	Y-X <sub>1</sub>	0,0675	0,0712	Normal
2	Y-X <sub>2</sub>	0,0702	0,0712	Normal
3	Y-X <sub>3</sub>	0,0706	0,0712	Normal
4	X <sub>3</sub> -X <sub>1</sub>	0,0708	0,0712	Normal
5	X <sub>3</sub> -X <sub>2</sub>	0,0712	0,0712	Normal

Path analysis can be done if all of the requirements are fulfilled. Before the proposed hypothesis is being tested, the regression analysis needed to be done first. After being calculated, the result of the significance and linear regression of fundamental motor skill toward financial condition can be seen as the table below:

**Table 2.** Significance test and regression linear of variable Y toward X<sub>1</sub>  $\hat{Y}=29,72+0,06X_1$

Variant Sources	Dk	JK	RJK	F-count	F-table	
					$\alpha = 0,05$	$\alpha = 0,01$
Total	155	221486				
Coefficient (a)	1	218982,43	275,15	<b>18,89**</b>	3,90	6,29
Regression (b/a)	1	275,15				
Sisa	153	2228,42	14,56			
Tuna Cocok	63	908,44	14,42	0,98 <sup>ns</sup>	1,47	1,71
Galat	90	1319,98	14,67			

The regression linear is  $\hat{Y} = 29.72 + 0.06X_1$  where  $F_{count} = 18.89 > 3.90 = F_{table(5\%)}$  and  $F_{count} = 18,89 > 6,29 = F_{table(1\%)}$  with dk (1; 153). Thus, it can be said that regression coefficient is very significance. Also, it is found that  $F_{count} = 0,98 < 1,47 = F_{table(5\%)}$  and  $F_{count} = 0,98 < 1,71 = F_{table(1\%)}$  with dk (63;90) so that the relationship between fundamental motor skill and financial condition forms a linear. The result of regression linear of fundamental motor skill toward the playing activities is described in the following table:

**Table 3.** Significance test and regression linear of variable Y toward X<sub>2</sub>  $\hat{Y}=18,91+0,15X_2$

Variant Sources	Dk	JK	RJK	F-count	F-table	
					$\alpha = 0,05$	$\alpha = 0,01$
Total	155	221486				
Coefficient (a)	1	218982,43	475,40	35,86	3,90	6,29
Regression (b/a)	1	475,40				
Sisa	153	2028,17	13,26			
Tuna Cocok	42	681,31	16,22	1,34	1,48	1,76
Galat	111	1346,86	12,13			

It is found that regression linear is  $\hat{Y} = 18,91 + 0,15X_2$  where  $F_{\text{count}} = 35,86 > 3,90 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 35,86 > 6,29 = F_{\text{table}(1\%)}$  with dk (1;153) so that the regression coefficient is very significance. Also, it is known that  $F_{\text{count}} = 1,34 < 1,48 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 1,34 < 1,76 = F_{\text{table}(1\%)}$  with dk (42;111) so that the relationship between fundamental motor skill and playing activities forms a linear. The result of regression linear of fundamental motor skill toward the nutrition status can be seen in the following table:

**Table 4.** Significance test and regression linear of variable Y toward  $X_3$   $\hat{Y} = 35,52 + 0,03X_3$

Variant Sources	Dk	JK	RJK	F-count	F-table	
					$\alpha = 0,05$	$\alpha = 0,01$
Total	155	221486				
Coefficient (a)	1	218982,43	63,51	3,98	3,90	6,29
Regression (b/a)	1	63,51				
Sisa	153	2440,07	15,95			
Tuna Cocok	40	679,36	16,98	1,09	1,50	1,76
Galat	113	1760,70	15,58			

From the table above, it can be seen that regression linear is  $\hat{Y} = 35,52 + 0,03X_3$  where  $F_{\text{count}} = 3,98 > 3,90 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 3,98 < 6,29 = F_{\text{table}(1\%)}$  with dk (1;153). As a result, the regression coefficient is significance. Furthermore, it is found that  $F_{\text{count}} = 1,09 < 1,50 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 1,09 < 1,76 = F_{\text{table}(1\%)}$  with dk (40;113) so that the relationship of fundamental motor skill and nutrition status forms a linear. After being calculated, the result of regression linear of nutrition status toward financial condition can be seen in the table below:

**Table 5.** Significance test and regression linear of Variabel  $X_3$  toward  $X_1$   $\hat{Y} = 35,15 + 0,20X_1$

Variant Sources	Dk	JK	RJK	F-count	F-table	
					$\alpha = 0,05$	$\alpha = 0,01$
Total	155	623191				
Coefficient (a)	1	568731,10	2870,50	8,51	3,90	6,29
Regression (b/a)	1	2870,50				
Sisa	153	51589,39	337,19			
Tuna Cocok	63	17176,25	272,64	0,71	1,47	1,71
Galat	90	34413,14	382,37			

It can be clearly seen that the regression linear is  $\hat{Y} = 35,15 + 0,20X_1$  which is  $F_{\text{count}} = 8,51 > 3,90 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 8,51 > 6,29 = F_{\text{table}(1\%)}$  with dk (1;153) so that regression coefficient is very significance. It is also known that  $F_{\text{count}} = 0,71 < 1,47 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 0,71 < 1,71 = F_{\text{table}(1\%)}$  with dk (63; 90). Thus, the relationship of nutrition status and financial condition forms a linear.

### 3.1. The significance and linear regression of nutrition status ( $X_3$ ) toward playing activities ( $X_2$ )

The following table is the result of regression linear of the nutrition status toward the playing activities.

**Table 6.** Significance test and regression linear of Variable  $X_3$  toward  $X_2 \hat{Y} = 36,24 + 0,20X_2$

Variant Sources	Dk	JK	RJK	F-count	F-table	
					$\alpha = 0,05$	$\alpha = 0,01$
Total	155	623191				
Coefficient (a)	1	578731,10	1107,37			
Regression (b/a)	1	1107,37		4,00	3,90	6,29
Sisa	153	42352,52	276,81			
Tuna Cocok	42	17122,45	407,68			
Galat	111	36530,08	329,10	1,24	1,48	1,76

The table shows that the regression linear is  $\hat{Y} = 36,24 + 0,20X_2$  which is  $F_{\text{count}} = 4,00 > 3,90 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 4,00 < 6,29 = F_{\text{table}(1\%)}$  with dk (1; 153) so that the regression coefficient is significance. It is also found that  $F_{\text{count}} = 1,24 < 1,48 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 1,24 < 1,76 = F_{\text{table}(1\%)}$  with dk (42; 111). Thus, the relationship of nutrition status and playing activities forms a linear.

The results of hypothesis test are: 1) financial condition has a positive effect toward the students' fundamental motor skill. 2) Playing activities has a positive effect toward the students' fundamental motor skill. 3) Nutrition status has a positive effect toward the students' fundamental motor skill. 4) Financial condition has a positive effect toward the nutrition status. 5) Playing activities has a positive effect toward the nutrition status. 6) Path coefficient shows that financial condition indirectly influenced the fundamental motor skill through nutrition status. Thus, influence of  $X_1 \rightarrow X_3 \rightarrow Y = (p_{y1}) \times (p_{31}) = (0,228) \times (0,213) = 0,049$ . 7) Path coefficient shows that playing activities indirectly influenced the students' fundamental motor skill through nutrition status. As a result, the influence of  $X_2 \rightarrow X_3 \rightarrow Y = (p_{y2}) \times (p_{32}) = (0,374) \times (0,171) = 0,064$ .

The result of the first hypothesis states that financial condition has a positive effect toward the students' fundamental motor skill. It is because financial condition is not only about the nutrition intake but also a good house, facilities, and the way parents rise up the children. The situation of low social class correlating to better scores in developmental tests during infancy was caused by indigenous child-upbringing practices that have a positive influence on development, such as nursing and close contact between baby and its mother [5]. Further research Lang etc explain The results of this study suggest a considerable percentage of children with developmental risks (fine motor skills up to 20.9%; grossmotor skills up to 14.4%). Finemotor skills were more affected than gross motor skills [6].

Second hypothesis test states that the children' fundamental motor skill can be improved through playing activities. It is because the active children tend to have good fundamental motor skills comparing to those who are not. As a result, it is also supported previous research about the influences of playing activities toward the fundamental motor skills of kindergarten students. If we want children to become physically active for life, we need to help them acquire the motor skills that will allow them to participate in a wide range of physical activities. The results suggest that more attention should be paid to monitoring the level of development of fundamental motor skills at the preschool age and given information on gender differences which could help preschoolers and parents identify which skill should be targeted [7]. According regular physical education, composed by structured practice, ministered by a specialist pro-mote gross motor development of children even at young age such as in kindergarten [8]. The results are consistent with Tsapakidou research showed that suitable, well formed movement programs can develop children's fundamental movement skills. In that way, the importance of movement development before kindergarten school is emphasised. Consequently, educators are being encouraged to utilize children's natural inclination for movement and to integrate organised motor skills programs into their daily schedule [9].

The result of the third hypothesis test states that the fundamental motor skill of kindergarten students is influenced by their nutrition status. The kindergarten students who have good nutrition status tend to have a good fundamental motor skill comparing to those who have low nutrition status. The result of the fourth hypothesis test shows that financial condition influenced the nutrition status of kindergarten students. In other words, young and older adults may have similar motor control knowledge to represent interception abilities. However, accuracy of space extension with tools is affected by the dynamic environment provided by the spatial-temporal coincidence task. [10]. The fifth hypothesis says that playing activities influenced the nutrition status. Meanwhile, the result of the sixth hypothesis shows that financial condition indirectly affects the fundamental motor skill through the nutrition status. Instead, financial condition will affect the life style and demand of the family members. Last, the result of the seventh hypothesis describes that playing activities indirectly affect the fundamental motor skill through the nutrition status.

To increase the physical activity of preschoolers, further interventions are needed: (1) improve teachers' knowledge through both pre-service and in-service training, (2) create classrooms, schools, and play-spaces that allow children to move and play safely, (3) develop teachers' self-efficacy through health-related fitness activities, (4) encourage parental involvement by educating parents about their role in regard to children's physical-activity behaviors, and (5) collaborate and cooperate with colleagues in other departments in order to share ideas, resources, and methods in regard to PA implementation in children's early years [11].

#### 4. Conclusion

Based on the hypothesis test and data analysis that have been discussed earlier, it could be concluded that: 1) financial condition has a direct positive effect toward the fundamental motor skill of kindergarten school students. 2) Playing activities have a direct positive effect toward the fundamental motor skill of kindergarten students. 3) Nutrition status, directly, has a positive effect toward the fundamental motor skill of kindergarten students. 4) Financial condition has a direct positive effect toward the nutrition status of kindergarten students. 5) Playing activities has a direct positive effect toward the nutrition status of kindergarten students. 6) Financial condition indirectly influenced the fundamental motor skill through the nutrition status. 7) Playing activities indirectly influenced the fundamental motor skill through the nutrition status.

#### References

- [1] Goodway J D, Famelia R and Bakhtiar S 2014 Future directions in physical education & sport: developing fundamental motor competence in the early years is paramount to lifelong physical activity *Asian Social Science* **10(5)** 44.
- [2] Graham G, Holt S A and Parker M 2007 *Children Moving A Reflective Approach tu Teaching Phisycal Education* New York Mc Graw Hill
- [3] Bakhtiar S 2014 Strategi Pembelajaran, Lokasi Sekolah, dan Kemampuan Gerak Dasar Siswa Sekolah Dasar. *J Ilmu Pendidikan* **20 Nomor 2** 127-252
- [4] Bakhtiar S, Famelia R and Goodway J A 2015 Needs Assesment of the Fundamental Motor Skills of Urban and Rural Children in Indonesia *J of Sport& Exercise Psychology* **37** 1-13
- [5] Venetsanou F and Kambas A 2010 Environmental Factors Affecting Preschoolers' Motor Development *Early Childhood Educ J* **37** 319–327
- [6] Lang A G, Franze M and Hoffman W 2013 Associations of Motor Developmental Risks with the Socioeconomic Status of Preschool Children in North-Eastern Germany *Hindawi Publishing Corporation Child Development Research* **6** 123-134
- [7] Nikolić I, Mraković S and Kunješić M 2016 Gender Differences of Preschool Children in Fundamental Movement Skills *Croatian J of Education* **18** 123-131
- [8] Lemos A G, Alvigo E L and Barela J A 2012 Physical Education in Kindergarten Promotes

- Fundamental Motor Skill Development *Advances in Physical Education J* **2** 17-21
- [9] Tsapakidou A, Stefanidou S and Tsompanaki E 2014 *Locomotor Development of Children Aged 3.5 to 5 Years in Nursery Schools in Greece. Review of European Studies* Canadian Center of Science and Education
- [10] Caçola P, Gabbard C, Santos D C and Batistela A C T 2011 Development of the affordances in the home environment for motor development–infant scale *Pediatrics international* **53(6)** 820-825.
- [11] Celik S S and Johnson J E 2013 I Need to Move and So Do the Children *International Education Studies* **6** 12-26



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Tuna Cocok	63	908,44	14,42	0,98 <sup>ns</sup>	1,47	1,71
Galat	90	1319,98	14,67			

The regression linear is  $= 29.72 + 0.06X_1$  where  $F_{count} = 18.89 > 3.90 = F_{table(5\%)}$  and  $F_{count} = 18.89 > 6.29 = F_{table(1\%)}$  with dk (1;153). Thus, it can be said that regression coefficient is very significance. Also, it is found that  $F_{count} = 0,98 < 1,47 = F_{table(5\%)}$  and  $F_{count} = 0,98 < 1,71 = F_{table(1\%)}$  with dk (63;90) so that the relationship between fundamental motor skill and financial condition forms a linear. The result of regression linear of fundamental motor skill toward the playing activities is described in the following table:

**Table 3.** Significance test and regression linear of variable Y toward X<sub>2</sub> =18,91+0,15X<sub>2</sub>

Variant Sources	Dk	JK	RJK	F-count	F-table	
					= 0,05	= 0,01
Total	155	221486				
Coefficient (a)	1	218982,43				
Regression (b/a)	1	475,40	475,40	35,86	3,90	6,29
Sisa	153	2028,17	13,26			
Tuna Cocok	42	681,31	16,22	1,34	1,48	1,76
Galat	111	1346,86	12,13			

It is found that regression linear is  $= 18,91 + 0,15X_2$  where  $F_{count} = 35,86 > 3,90 = F_{table(5\%)}$  and  $F_{count} = 35,86 > 6,29 = F_{table(1\%)}$  with dk (1;153) so that the regression coefficient is very significance. Also, it is known that  $F_{count} = 1,34 < 1,48 = F_{table(5\%)}$  and  $F_{count} = 1,34 < 1,76 = F_{table(1\%)}$  with dk (42;111) so that the relationship between fundamental motor skill and playing activities forms a linear. The result of regression linear of fundamental motor skill toward the nutrition status can be seen in the following table:

**Table 4.** Significance test and regression linear of variable Y toward  $X_3 = 35,52 + 0,03X_3$ 

Variant Sources	Dk	JK	RJK	F-count	F-table	
					= 0,05	= 0,01
Total	155	221486				
Coefficient (a)	1	218982,43				
Regression (b/a)	1	63,51	63,51	3,98	3,90	6,29
Sisa	153	2440,07	15,95			
Tuna Cocok	40	679,36	16,98	1,09	1,50	1,76
Galat	113	1760,70	15,58			

From the table above, it can be seen that regression linear is  $= 35,52 + 0,03X_3$  where  $F_{count} = 3,98 > 3,90 = F_{table(5\%)}$  and  $F_{count} = 3,98 < 6,29 = F_{table(1\%)}$  with dk (1;153). As a result, the regression coefficient is significance. Furthermore, it is found that  $F_{count} = 1,09 < 1,50 = F_{table(5\%)}$  and  $F_{count} = 1,09 < 1,76 = F_{table(1\%)}$  with dk (40;113) so that the relationship of fundamental motor skill and nutrition status forms a linear. After being calculated, the result of regression linear of nutrition status toward financial condition can be seen in the table below:

**Table 5.** Significance test and regression linear of Variabel  $X_3$  toward  $X_1 = 35,15 + 0,20X_1$ 

Variant Sources	Dk	JK	RJK	F-count	F-table	
					= 0,05	= 0,01
Total	155	623191				
Coefficient (a)	1	568731,10				
Regression (b/a)	1	2870,50	2870,50	8,51	3,90	6,29
Sisa	153	51589,39	337,19			
Tuna Cocok	63	17176,25	272,64	0,71	1,47	1,71
Galat	90	34413,14	382,37			

It can be clearly seen that the regression linear is  $= 35,15 + 0,20X_1$  which is  $F_{count} = 8,51 > 3,90 = F_{table(5\%)}$  and  $F_{count} = 8,51 > 6,29 = F_{table(1\%)}$  with dk (1;153) so that regression coefficient is very significance. It is also known that  $F_{count} = 0,71 < 1,47 = F_{table(5\%)}$  and  $F_{count} = 0,71 < 1,71 = F_{table(1\%)}$  with dk (63;90). Thus, the relationship of nutrition status and financial condition forms a linear.

3.1.1 *The significance and linear regression of nutrition status ( $X_3$ ) toward playing activities ( $X_2$ ).* The following table is the result of regression linear of the nutrition status toward the playing activities.

**Table 6.** Significance test and regression linear of Variable  $X_3$  toward  $X_2 = 36,24 + 0,20X_2$ 

Variant Sources	Dk	JK	RJK	F-count	F-table	
					= 0,05	= 0,01
Total	155	623191				
Coefficient (a)	1	578731,10				
Regression (b/a)	1	1107,37	1107,37	4,00	3,90	6,29
Sisa	153	42352,52	276,81			
Tuna Cocok	42	17122,45	407,68	1,24	1,48	1,76
Galat	111	36530,08	329,10			

The table shows that the regression linear is  $= 36,24 + 0,20X_2$  which is  $F_{count} = 4,00 > 3,90 = F_{table(5\%)}$  and  $F_{count} = 4,00 < 6,29 = F_{table(1\%)}$  with dk (1;153) so that the regression coefficient is

significance. It is also found that  $F_{\text{count}} = 1,24 < 1,48 = F_{\text{table}(5\%)}$  and  $F_{\text{count}} = 1,24 < 1,76 = F_{\text{table}(1\%)}$  with dk (42;111). Thus, the relationship of nutrition status and playing activities forms a linear.

The results of hypothesis test are: 1) financial condition has a positive effect toward the students' fundamental motor skill. 2) Playing activities has a positive effect toward the students' fundamental motor skill. 3) Nutrition status has a positive effect toward the students' fundamental motor skill. 4) Financial condition has a positive effect toward the nutrition status. 5) Playing activities has a positive effect toward the nutrition status. 6) Path coefficient shows that financial condition indirectly influenced the fundamental motor skill through nutrition status. Thus, influence of  $X_1 \rightarrow X_3 \rightarrow Y = (p_{y1}) \times (p_{31}) = (0,228) \times (0,213) = 0,049$ . 7) Path coefficient shows that playing activities indirectly influenced the students' fundamental motor skill through nutrition status. As a result, the influence of  $X_2 \rightarrow X_3 \rightarrow Y = (p_{y2}) \times (p_{32}) = (0,374) \times (0,171) = 0,064$ .

The result of the first hypothesis states that financial condition has a positive effect toward the students' fundamental motor skill. It is because financial condition is not only about the nutrition intake but also a good house, facilities, and the way parents rise up the children. The situation of low social class correlating to better scores in developmental tests during infancy was caused by indigenous child-upbringing practices that have a positive influence on development, such as nursing and close contact between baby and its mother [5]. Further research Lang etc explain The results of this study suggest a considerable percentage of children with developmental risks (fine motor skills up to 20.9%; grossmotor skills up to 14.4%). Finemotor skills were more affected than gross motor skills [6].

Second hypothesis test states that the children' fundamental motor skill can be improved through playing activities. It is because the active children tend to have good fundamental motor skills comparing to those who are not. As a result, it is also supported previous research about the influences of playing activities toward the fundamental motor skills of kindergarten students. If we want children to become physically active for life, we need to help them acquire the motor skills that will allow them to participate in a wide range of physical activities. The results suggest that more attention should be paid to monitoring the level of development of fundamental motor skills at the preschool age and given information on gender differences which could help preschoolers and parents identify which skill should be targeted [7]. According regular physical education, composed by structured practice, ministered by a specialist pro-mote gross motor development of children even at young age such as in kindergarten [8]. The results are consistent with Tsapakidou research showed that suitable, well formed movement programs can develop children's fundamental movement skills. In that way, the importance of movement development before kindergarten school is emphasised. Consequently, educators are being ncouraged to utilize children's natural inclination for movement and to integrate organised motor skills programs into their daily schedule [9].

The result of the third hypothesis test states that the fundamental motor skill of kindergarten students is influenced by their nutrition status. The kindergarten students who have good nutrition status tend to have a good fundamental motor skill comparing to those who have low nutrition status. The result of the fourth hypothesis test shows that financial condition influenced the nutrition status of kindergarten students. In other words, young and older adults may have similar motor control knowledge to represent interception abilities. However, accuracy of space extension with tools is affected by the dynamic environment provided by the spatial-temporal coincidence task. [10]. The fifth hypothesis says that playing activities influenced the nutrition status. Meanwhile, the result of the sixth hypothesis shows that financial condition indirectly affects the fundamental motor skill through the nutrition status. Instead, financial condition will affect the life style and demand of the family members. Last, the result of the seventh hypothesis describes that playing activities indirectly affect the fundamental motor skill through the nutrition status.

To increase the physical activity of preschoolers, further interventions are needed: (1) improve teachers' knowledge through both pre-service and in-service training, (2) create classrooms, schools, and play-spaces that allow children to move and play safely, (3) develop teachers' self-efficacy

through health-related fitness activities, (4) encourage parental involvement by educating parents about their role in regard to children's physical-activity behaviors, and (5) collaborate and cooperate with colleagues in other departments in order to share ideas, resources, and methods in regard to PA implementation in children's early years [11].

#### 4. Conclusion

Based on the hypothesis test and data analysis that have been discussed earlier, it could be concluded that: 1) financial condition has a direct positive effect toward the fundamental motor skill of kindergarten school students. 2) Playing activities have a direct positive effect toward the fundamental motor skill of kindergarten students. 3) Nutrition status, directly, has a positive effect toward the fundamental motor skill of kindergarten students. 4) Financial condition has a direct positive effect toward the nutrition status of kindergarten students. 5) Playing activities has a direct positive effect toward the nutrition status of kindergarten students. 6) Financial condition indirectly influenced the fundamental motor skill through the nutrition status. 7) Playing activities indirectly influenced the fundamental motor skill through the nutrition status.

#### 5. References

1. Goodway J, Famelia, R, Bakhtiar, S. Future Directions in Physical Education & Sport: Developing Fundamental Motor Competence in the Early Years Is Paramount to Lifelong Physical Activity. *Asian Social Sci J* [Internet] 2014 Feb [cited 2016 Sept 14]; Vol. 10, No. 5. pp 44-54
2. Graham G, Holt S A, Parker M. *Children Moving A Reflective Approach tu Teaching Phisycal Educatin*. New York: Mc Graw Hill, 2007.
3. Bakhtiar S, Strategi Pembelajaran, Lokasi Sekolah, dan Kemampuan Gerak Dasar Siswa Sekolah Dasar. *J Ilmu Pendidikan* Jilid 20 Nomor 2, Desember 2014, p. 127-252
4. Bakhtiar S, Famelia R , Goodway, J. A Needs Assesment of the Fundamental Motor Skills of Urban and Rural Children in Indonesia. *J of Sport& Exercise Psychology*. Vol 37 June 2015
5. Venetsanou, F and Kambas, A. Environmental Factors Affecting Preschoolers' Motor Development. *Early Childhood Educ J* (2010) 37:319–327 DOI 10.1007/s10643-009-0350-z
6. Lang A G, Franze M, Hoffman W. Associations of Motor Developmental Risks with the Socioeconomic Status of Preschool Children in North-Eastern Germany. *Hindawi Publishing Corporation Child Development Research* Volume 2013, Article ID 790524, 6 pages <http://dx.doi.org/10.1155/2013/790524>
7. Nikoli I, Mrakovi S, Kunješi M. Gender Differences of Preschool Children in Fundamental Movement Skills. *Croatian J of Education* Vol.18; Sp.Ed.No.1/2016, pages: 123-131
8. Lemos A G, Alvigo E L, Barela J A. Physical Education in Kindergarten Promotes Fundamental Motor Skill Development. *Advances in Physical Education J* 2012. Vol.2, No.1, pp. 17-21
9. Tsapakidou A, Stefanidou S, Tsompanaki E. Locomotor Development of Children Aged 3.5 to 5 Years in Nursery Schools in Greece. *Review of European Studies*; Vol. 6, No. 2; 2014. Published by Canadian Center of Science and Education. doi:10.5539/res.v6n2p1 URL: <http://dx.doi.org/10.5539/res.v6n2p1>
10. P. Cacola, C. Gabbard, D. C. C. Santos, and A. C. T. Batistela, "Development of the affordances in the home environment for motor development-infant scale," *Pediatrics International*, vol. 53, no. 6, pp. 820–825, 2011
11. Celik, S S & Johnson J E. I Need to Move and So Do the Children. *International Education Studies*; Vol. 6, No. 5; 2013 Published by Canadian Center of Science and Education