

# Impact of Parental Background on Children's Physical Literacy: A Structural Equation Modeling Analysis

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**Abstract** Physical literacy is essential for developing attitudes and habits toward physical activity for a healthy life. Parents' backgrounds are believed to contribute significantly to children's physical literacy development. This study investigates how parental background - specifically, parental education, parental income, and parental passion for sport, affects children's physical literacy levels. The investigation was conducted in the Bojonegoro Regency with 351 participants, including 184 boys and 167 girls, with a mean age of 11.38 years. The effects of parental education, parental income, and parental passion for sport on children's physical literacy were collected using a questionnaire and analyzed using a structural equation model. Model testing results indicate that CMIN = 1.785, RMR = 0.050, RMSEA = 0.047, IFI = 0.904, and CFI = 0.908 are accurate values, indicating that the model matches the data. The model explains that parental income and passion for sports significantly affect children's physical literacy. Meanwhile, parental education has no significant effect on children's physical literacy. In summary, this study has demonstrated a positive correlation between parental wealth and the level of physical literacy in children and a favorable association between parental passion for sports and children's physical literacy. However, it has yet established conclusive evidence demonstrating the favorable impact of parental education on children's physical literacy. It is imperative for policymakers to actively promote the development of parents' physical literacy to foster a societal environment that values and prioritizes engagement in physical activities.

**Keywords** Parental Education, Parental Income, Parental Passion for Sport, Physical Literacy

## 1. Introduction

Physical literacy is a concept that is currently developing in Indonesia but slower than in developed countries [1]. The Indonesian government realizes the importance of physical fitness and literacy for the school-age group [2]. Physical literacy studies in Indonesia also focus on elementary school children [3], [4]. The physical literacy program in Indonesia is designed to target school-age children, focusing on developing attitudes and healthy living habits with physical activity that can last a lifetime.

Physical literacy is a fundamental movement ability that allows people to adapt to their surroundings and others in various physical activities [5] and is operationalized as an application of autonomous movement [6]. Physically literate people can use their physical, emotive, cognitive, and social capacities to promote health through movement and physical activity [7]. Physical literacy is essential for humans and can be promoted at any age [8]. Physical literacy is essential for lifelong physical activity [9] and influences physical activity at a young age [10]. Because physical literacy is essential for living a healthy and fulfilling life through movement and physical activity, the construction of physical literacy appears in the promotion of children's health [11] because high physical literacy in

children is associated with good health indicators [12] and beneficial for early adolescents' behavioral and psychological health [13].

Recently, it was discovered that parental involvement plays an important role in their children's journey toward physical literacy [14]. Parents are among the most influential yet significantly underestimated factors in their children's education [15]. Parents are known to be able to help their children develop physical literacy [16], [17]. Parents are important social agents in achieving physical education goals, instilling physical literacy in their children [18]. Some researchers agree that parents are important in developing their children's physical literacy.

The question is, "How can parents help their children develop physical literacy?" It also brings new concerns: What factors can parents use to help their children acquire physical literacy? Although there is no direct or indirect evidence of parental factors influencing physical literacy, it is known that three parental characteristics influence their children's physical activity or physical literacy. Three parental factors are known to influence their children's physical activity or physical literacy. Physical literacy is an important concept in physical activity [19], and developing physical literacy in children is the key to helping them become more physically active [17]. The parents' three factors are their degree of education, their parent's opinions, and their parents' love of sports.

The degree of education and income of parents (mothers) can influence their children's physical activity [20]. More informed parents can give their children scheduled time to balance physical activity and sedentary behavior [21]. Foster parents with lower physical literacy may perceive less control over providing for their children's physical activity. On the other hand, African-American foster parents with lower education had lower overall and specific physical literacy scores [22]. Children from low socioeconomic levels usually do not have the same access to physical activity as children from wealthy backgrounds [23], and they rarely have the support of their parents [24]. The study's results prove that parents' educational level and income significantly influence their children's physical literacy or physical activity.

Although it is marginally associated with children's physical activity, parents' taste for sports plays an important role in establishing their children's physical activity [25]. As many as 88.52% of youngsters copy their parents' habits [26]. Physical activity is six times more likely among adolescents with physically active parents [27]. Children prefer to participate in sports if their parents do as well. Children's degree of physical activity is dependent on or related to the level of parental interest in sports.

Although many studies have examined the relationship and influence of parent's educational level, parental income, and parental preferences in sports on physical literacy, not enough research has examined these variables simultaneously. This research aims to construct a

theoretical model that will shed light on the interplay between parents' educational level, parents' income, and parents' hobbies in sports and their children's physical literacy. The objective of all progress, including a subset of the sustainable development goals, should be to foster physical literacy and cultivate lifelong physical activity that promotes health benefits. Hence, the outcomes of this investigation can assist policymakers and social advocates in formulating efficient and cost-effective approaches to enhance individuals' physical literacy. From a theoretical standpoint, this study elucidates the process of attaining physical literacy by examining the influence of parental background characteristics, specifically parental education, parental money, and parental passion for sport.

## 2. Materials and Methods

### 2.1. Research Participant

This study was conducted using a survey method that involved the collection of data from several samples of the population using a questionnaire. This investigation involved 351 elementary school students in Bojonegoro, 52% of whom were male and 48% of whom were female. Children ranged in age from 9 to 13, with a mean age of 11.5 (SD = 13.4) years.

### 2.2. Instruments and Methods

A questionnaire was used to collect the data. This study employed four questionnaires, including one to assess children's physical literacy and another to gather information on their parents. At least four factors must be considered when assessing physical literacy: physical ability (PA), psychological ability (PcA), social ability (SA), and cognitive ability (CA) [7], [28]. The four principles were then developed into 30-item statements with a scoring technique. If the child chooses a more developed answer, they will get a score of '4' if they say the statement is "a lot like them"; they score a '3' if they say the statement is "slightly similar to them". If the child chooses the least developed answer, they will receive a score of '2' if they say the statement is "slightly like them" or a score of '1' if they say it is "a lot like them". The pilot study results indicate that this instrument's validity is relatively high. Validity coefficients fall between 0.283 and 0.661 when item-total correlation analysis is performed. Cronbach's alpha indicates a level of trustworthiness of 0.915.

The instrument for measuring parental background is measured using three aspects: parental education (PE), parental income (PI), and parental passion for the sport (PPS). The instrument was designed as a 10-item questionnaire consisting of two items measuring parents' recent education, two measuring parents' monthly income, and six measuring parents' passion for sports. The parents' levels of education are rated from 1 to 4: 1 for elementary

school, 2 for middle school, 3 for high school, and 4 for college, graduate school, and professional degrees. The monthly income of both parents, with a value of 1 for income less than Rp. 1,500,000; value 2 for income between Rp. 1,500,000 and Rp. 2,500,000; value 3 for income between Rp. 2,500,000 and Rp. 3,500,000; and value 4 for income more than Rp. 3,500,000 [29]. Aspects of parents' fondness for sports adopted and modified from [30] with a value of 1 for "never," 2 for "rarely," 3 for "sometimes," and 4 for "often." When employing the Items-Total Correlations analysis approach, the validity coefficients of the instruments range from 0.241 to 0.698. On the other hand, the Cronbach's alpha dependability coefficient is 0.793.

### 2.3. Analyzing the Data

The Structural Equation Modeling (SEM) approach was used to analyze the data since it is a multivariate confirmatory statistical tool for simultaneously analyzing the structural relationship among multiple variables. SEM is a statistical technique combining regression and factor analysis elements. Latent and observational variables are the two main categories of variables in Structural Equation Modeling. Latent variables, often known as factors, are theoretical entities whose impact on an observed variable can only be quantified indirectly.

On the other hand, observed variables, also known as indicators, can be measured empirically. In causal logic, seen factors are endogenous variables, whereas latent variables are exogenous variables. The SEM process produces a theoretical model, which is essentially a summary that defines the interrelationships between variables and is typically written in mathematical formulas. A good model must be capable of explaining the observed occurrence with a low margin of error.

Two connected processes make up Structural Equation Modeling. In order to ensure the model is accurate, it must first be compared to the data to see if any discrepancies exist. Second, a fit test can be performed to determine whether or not the theoretical model is appropriate for the data by examining the structural relationships of the model.

The proposed theoretical model can be used to explain the data if it is not accepted that there is a discrepancy between the model and the data. Each hypothesis can be tested if a proper model is available, revealing the influence of one variable over another. Root Mean Square Error of Approval (RMSEA)  $\leq 0.08$ , Root Mean Square Residual (RMR)  $\leq 0.05$ , Comparative Fit Index (CFI)  $\geq 0.90$ , Incremental Fit Index (IFI)  $\geq 0.90$ , and CMIN/DF  $< 2$  are the test requirements.

## 3. Results

According to the data analysis results, parents' educational level, parental income, and parents' liking for sports among fathers and mothers in Bojonegoro produced mixed results. Parents' educational level did not demonstrate a statistically significant distinction, as indicated by an F value of 0.196 at a significance level of  $P = 0.658$ . However, there was a significant disparity between fathers and mothers regarding parental income, with an F value of 47.080 at a significance level of  $P = 0.000$ . Furthermore, parents' interest in sports exhibited no variation at low and moderate physical activity levels. Still, there was a significant discrepancy at high levels of physical activity, as evidenced by an F value of 7.722 at a significance level of  $P = 0.006$  (Table 1). It demonstrates that fathers earn higher family income, but moms engage in low- to moderate-level physical exercise. According to our findings, mothers participate substantially less than fathers. Women's reduced engagement in physical activity can be attributed to their considerations over reproductive health, limited social support, gender-related concerns, and time constraints.

Data study also revealed no differences in age, gender, or physical literacy among children. Gender did not differ significantly, with an F value of 1.949 at  $P = 0.164$ , and age did not differ significantly, with an F value of 0.987 at  $P = 0.426$  (Table 2). It demonstrates that gender and age between 9 and 13 years do not affect children's physical literacy.

**Table 1.** The Differences in Parents' Education, Income, Parents' Passion for Sport between Father and Mother

		Mean Square	F	Sig.
Parents Education	Between Groups	0.172	0.196	0.658
	Within Groups	0.880		
	Total			
Parents Income	Between Groups	45.134	47.080	0.000**
	Within Groups	0.959		
	Total			
Parent Low-Level Activity	Between Groups	0.963	0.939	0.333
	Within Groups	1.025		
	Total			
Parent Middle-Level Activity	Between Groups	3.147	2.940	0.087
	Within Groups	1.070		
	Total			
Parent Hight Level Activity	Between Groups	7.801	7.722	0.006**
	Within Groups	1.010		
	Total			

\*P&lt;0.05, \*\*P&lt;0.01

**Table 2.** The Differences in Children's Physical Literacy between Gender and Age

		Mean Square	F	Sig.
gander	Between Groups	0.272	1.949	0.164
	Within Groups	0.139		
	Total			
age	Between Groups	0.138	0.987	0.426
	Within Groups	0.140		
	Total			

As a result, what is the theoretical relationship between parents' educational level, income, sports interest, and children's physical literacy? The findings of the data analysis using SEM revealed that the theoretical model was built based on the data, with a CMIN of 1.785, an RMR of 0.050, an RMSEA of 0.047, an IFI of 0.904, and a CFI of 0.908 (Figure 1). Variable parental income is contributed by the father's and mother's income; variables that affect children's physical literacy are contributed by physical, psychologist, social, and cognitive variables (Figure 1).

A regression coefficient of -0.099 and a likelihood value of 0.102 shows no significant relationship between parental education and children's physical literacy. A direct association between parental income activities and children's physical literacy is demonstrated by a regression coefficient of 0.222 and a significance level of 0.056. The regression coefficient 0.124 with a significance level of P = 0.046 reveals a link between parents' sports passion and their children's physical literacy (Table 3).

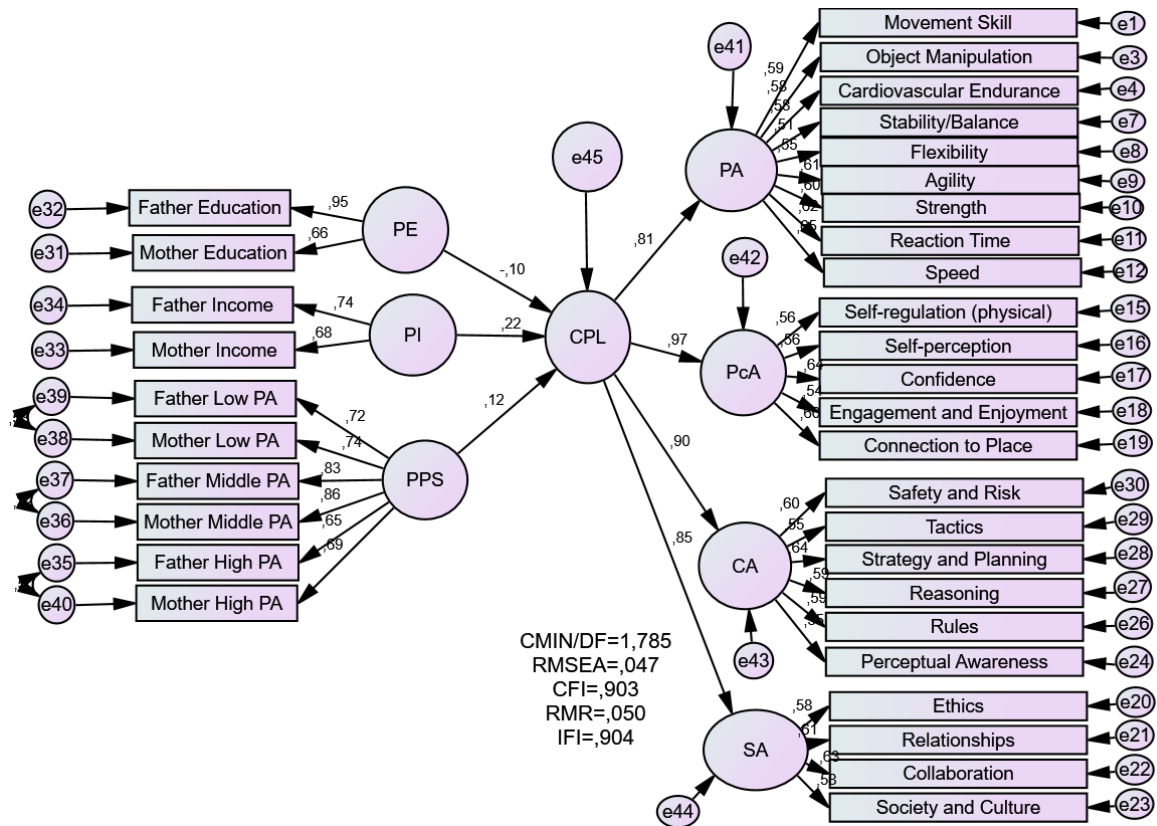


Figure 1. Structural Equation Modelling Parent Education, Parental Income, Parents' Passion for Sport, and Children's Physical Literacy

Table 3. Hypothesis Test Results

Hypothesis				Estimates	SE	CR	P	Regression
H <sub>1</sub>	Parent Education	→	Children's Physical Literacy	-0.064	0.039	-1.637	0.102	-0.099
H <sub>2</sub>	Parental Income	→	Children's Physical Literacy	0.138	0.050	2.759	0.006**	0.221
H <sub>3</sub>	Parents' Passion for Sport	→	Children's Physical Literacy	0.074	0.037	1.995	0.046*	0.124

\*P<0.05, \*\*P<0.01

### 4. Discussion

This research has provided empirical evidence about the structural relationship between parental income and passion for sport with children's physical literacy. Still, there is no significant relationship to the parent education factor. This study proves that the level of parental income and parental passion for sports can contribute positively to children's physical literacy. Meanwhile, the level of parental education could not contribute positively to children's physical literacy.

Our first finding is that parents' educational level cannot determine children's physical literacy. Although previous research has shown that parents' educational level can influence their children's physical literacy and physical activity, this is only sometimes the case [21], [22]. However, the results of our research found that educational level was separate from children's physical literacy. But parents' understanding and awareness of physical literacy

can contribute positively to physical literacy because parents' understanding and awareness of physical literacy can build physically active routines between parents and children in the family environment [31].

Our second finding is that the level of parental income can contribute positively to children's physical literacy. The results of this study are the first findings to examine the income level of parents with children with physical literacy, and no one has researched them before. Similar research examines income levels or social and economic status with physical activity significantly impacting [23], [24]. They found significant differences in children's physical activity level and their parents' socioeconomic level regarding access to facilities (comfortable sports venues and playgrounds). Even though these things are different, the results of our research can contribute to a new theory that the level of parental opinion does not only contribute positively to physical activity but also to children's physical literacy.

Our third finding is that parental passion for sports can positively contribute to children's physical literacy. The results of our study are the first findings to examine parental passion for sport with children's physical literacy, and no one has researched this before. There is similar research, namely research that examines parental passion for sports or physical activity with children physical activity which has a significant impact [25], [26], [32]. They found that parents' habits and hobbies in sports or physical activity significantly impacted their children's active behaviour in sports and physical activity. Even though these things are slightly different, the results of our research can contribute to a new theory that parental passion for sport does not only make a positive contribution to physical activity but also to children's physical literacy.

In the future, more research results will further encourage the superiority of the role of parents in children's physical literacy in life. The role of parents is crucial in developing children's physical literacy. Parents can promote physical literacy by involving children in physical activities, such as basic movement skills, outdoor play, family walks or cycling [17]. Conduct research through workshops. For instance, PLAYshop is a 75-minute session that employs interactive games, educational messaging, and educational resources to equip parents with the knowledge and confidence to foster their child's physical literacy [33], [34]. Improve the physical literacy of parents and children by delivering a parent-focused, theoretically grounded, and online intervention [35]. The workshop was conducted online for 60 minutes with the aim of 1) providing informative messages to increase parental awareness about physical activity participation, self-efficacy in physical activity, and knowledge about physical literacy; and 2) providing fun activities, resources and instructing fundamental movement skills that can increase the motivation and competence of parents in supporting the development of children's physical literacy and in line with co-engagement physical activity with children.

Our investigation must be completed. There are always possibilities to perform further studies to refine prior studies' conclusions. It is still being determined if the growth in physical literacy is exclusively due to parental wealth and sports interest or whether other aspects are involved. However, this study found that parental wealth and sports interests favorably impact children's physical literacy. This question will be researched further in the future.

## 5. Conclusions

Based on the analysis and interpretation of the data, the following conclusions can be inferred. Initially, there needs to be more substantial evidence supporting the notion that parental education has a discernible impact on children's physical literacy development. Secondly, it is worth noting that parents' income substantially influences their

children's physical literacy level. Thirdly, parental enthusiasm for a particular sport notably impacts children's physical literacy development. The present study has effectively demonstrated a favorable correlation between parental income and the passion for sports and its subsequent influence on children's physical literacy. However, concurrently, it has yet to establish conclusive evidence that parental education benefits children's physical literacy. Further investigation is needed to ascertain the underlying causes and any deficiencies in the physical literacy of our parents. Despite the importance of evaluating and improving physical education, research on such issues still needs to be conducted.

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