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Original Article

The Relationships between Financial Literacy with Mental Health of Adolescents: Mediating Role of Physical Activity

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Abstract

Introduction: Adolescent mental health has emerged as a critical issue in global public health, garnering significant attention from both the public and professionals. Furthermore, the essential role of physical activity (PA), known to significantly influence mental well-being, has not been investigated within this framework.
Objective: This study aimed to examine the relationships between financial literacy (FL) and adolescent mental health, while also considering the mediating effect of PA.
Methods: This study used a descriptive-correlational method using a structural equation modelling. A total of 384 adolescents (mean age = 16.85), comprising 192 boys and 192 girls, were chosen through convenience sampling. To evaluate the research variables, standardized assessment tools were utilized. The analysis was conducted using the Smart PLS statistical software version 4.
Results: The path analysis results indicate a significant positive structural relationship between mental health (P=0.000, t=9.35, b=0.46) and the PA (P=0.000, t=5.86, b=0.30) in relation to FL. Additionally, a significant positive structural relationship exists between the PA and mental health (P=0.000, t=4.18, b=0.26). Also, the results indicate that PA serves as a significant mediating factor in the relationship between the FL and mental health, with a p-value of 0.000, a t-value of 3.82, and a b coefficient of 0.12.
Conclusion: Individuals with limited FL may struggle to make sound financial choices, and the prevalence of various subscription services and easily accessible consumer loans can exacerbate the risk of significant mental distress.

Keywords: Adolescent, Literacy, Economics, Mental Health, Exercise

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1. Introduction

Financial health refers to an individual's ability to meet their current and future monetary needs (1). Financial health is a crucial concern that impacts individuals and organizations alike. It encompasses the management of income, expenses, and debts, reflecting one's ability to balance financial needs and desires (2). A sound financial health status is characterized by effective savings strategies, controlled spending, and adequate planning for retirement. Ultimately, achieving financial health requires a comprehensive assessment of these dimensions to ensure long-term stability and well-being (3). Certain behaviors can adversely impact an individual's financial well-being, leading to significant financial challenges. These behaviors encompass poor debt management, overspending, insufficient emergency savings, inadequate shopping skills, low income, and a general lack of financial literacy (FL) (4,5). Such patterns can result in financial stress, as individuals struggling to meet their daily expenses often find their options for improving their financial circumstances severely limited (6). This stress can manifest in various ways, including increased absenteeism at work, reliance on multiple loans, and frequent credit purchases (7). Consequently, financial difficulties and stress not only disrupt personal and family life but also extend their effects into the workplace (8). A primary contributor to these financial issues is often a deficiency in financial knowledge, which hinders individuals' ability to effectively manage, save, and invest their money.

When one is in a stable financial position, there is a sense of security regarding future financial circumstances, leading to reduced stress about money and an enhanced capacity to enjoy life (7). However, the connection between FL and psychological well-being remains an area that requires further exploration. Financial behavior encompasses the positive practices recommended for effective financial management (9). Key examples include maintaining manageable debt levels, adhering to a personal financial plan, actively saving, and avoiding financial disputes with family or partners. An individual's financial behavior is significantly shaped by their level of FL (10). Moreover, various financial stressors—such as life transitions, job changes, unexpected events, and challenging financial circumstances—can adversely impact one's financial well-being (11). The presence of financial stress often stems from insufficient financial knowledge and

detrimental financial habits, which are inversely related to overall financial satisfaction.

One crucial lesson that students should grasp early in their education is the management of personal finances (12). Regrettably, FL is rarely taught as a formal subject in schools worldwide. Issues related to money and debt are significant contributors to stress in adulthood, and these financial concerns can also affect high school students, leading to anxiety and mental health challenges (7,8,13,14). Many students grapple with questions about their future careers and whether those paths will provide the financial stability they seek. Students in their second year of secondary school should assess whether pursuing a university education is necessary for achieving their desired career opportunities (15,16). This consideration underscores the critical role of FL among high school students. The study of financial behavior emphasizes how students manage consumption and savings, both of which are prevalent practices during this stage of life. FL suggests that students can only attain true wealth by effectively organizing their finances. It is essential for high school students to understand the immediate and long-term implications of their spending habits, which directly relate to their ability to manage both spending and saving (14). Research indicates that enhancing students' FL equips them to make informed financial choices (9,17-20). By cultivating foundational money management skills, students can positively influence their knowledge, attitudes, and personal traits, ultimately leading to better financial decision-making and reduced negative financial outcomes in the future. Thus, promoting FL is vital for improving students' financial behaviors.

FL is a crucial area of study within household finance, initially introduced by Stoney and Stradling (9). The evolution of financial markets has led to increased interest in FL from major banks, government entities, and consumers alike. FL refers to the capacity to access financial information, make informed financial choices, and enhance personal well-being (18). This encompasses various components, including financial awareness, knowledge, skills, attitudes, and behaviors. Research by Van et al. indicates that FL significantly influences personal financial decision-making, with individuals possessing lower FL being less inclined to engage in the stock market (19). Furthermore, both Chinese and international scholars are examining the relationship between FL and household asset allocation, revealing that individuals with higher FL tend to have more diversified investment portfolios, actively participate in financial markets, and develop effective retirement plans, ultimately fostering greater wealth accumulation (20).

Adolescent mental health has emerged as a critical issue in global public health, garnering significant attention from both the public and professionals (21). Evidence indicates a troubling decline in the mental well-being of young people, marked by increasing rates of anxiety, depression, psychological stress, and suicide (22). Meanwhile, global pandemic and social isolation such as the COVID-19 pandemic exacerbated these issues, as isolation measures, reduced physical activity (PA), limited social interactions, and heightened internet usage contributed to a surge in mental health challenges among adolescents (23,24). Psychological distress, characterized by negative emotions such as anxiety and depression, has been linked to detrimental effects on academic performance, interpersonal relationships, self-harm, and suicidal thoughts (25,26). Consequently, it is essential to investigate the factors influencing mental health in adolescents to develop effective intervention strategies. Despite this, the impact of FL as a significant variable on the mental health of adolescents has not been explored in previous research. Additionally, the crucial component of PA, which can play a vital role in mental well-being, has not been examined in this context. Therefore, this study aimed to explore the relationships between FL with mental health among adolescents with considering the mediating role of PA.

2. Methods

2.1. Design and Participants

This study used a descriptive-correlational method using a structural equation modelling. The study's statistical population involved high-school students aged between 15 and 18 years. A total of 384 adolescents, comprising 192 boys and 192 girls, were chosen as study sample. Based on a sample size calculation appropriate for correlational research, with parameters set at α=0.05, β=0.05, and r=0.20, 197 participants in needed. However, to ensure more validity of the study, we selected higher number of participants. The average age of the participants was 16.85 years, with a standard deviation of 0.38. Participants were recruited through convenience sampling. Prior to the research's implementation, both participants and their parents received comprehensive information regarding the study's aims and methods. Inclusion criteria included being a high school student, no physical or mental health issues, and not being on any special medication. Participants who did not meet these criteria or who failed to complete the questionnaire were excluded from the study.

2.2. Measurements

2.2.1. Financial Literacy

The Financial Literacy Questionnaire was utilized to measure FL (27). It is a four-item scale for assessment. Sample questions included the understanding of the implications of inflation and interest rate fluctuations, as well as the practice of comparing prices when purchasing goods or services. In this study, the validity of this instrument has been confirmed by nine experts, yielding a Content Validity Index (CVI) of 0.90 and a Content Validity Ratio (CVR) of 0.92. Moreover, the Cronbach's alpha coefficient was determined to be 0.98, indicating excellent internal consistency.

2.2.2. Mental Health

In this research, the 28-item Goldberg Questionnaire (GHQ) was employed as the primary tool for data measurement and collection (28). This instrument, designed to detect non-psychotic mental disorders, is widely used for diagnosing mild mental health issues and screening for psychological disorders in various clinical environments. Developed by Goldberg and Hiller in 1972, the questionnaire utilizes a four-point scale that ranges from "not at all" to "much more than usual." In this study, the validity of this instrument has been confirmed by nine experts, yielding a CVI of 0.93 and a CVR of 0.96. Moreover, the Cronbach's alpha coefficient for the scale was

determined to be 0.95, indicating a high level of internal consistency.

2.2.3. Physical Activity

The Physical Activity Questionnaire for Adolescents (PAQ-A) was utilized to assess PA levels of participants (29). This self-reported tool consists of nine questions, each scored from 1 to 5, where a score of 1 indicates minimal activity and 5 represents the highest activity level. The overall PA score is calculated by summing the scores of all nine questions and averaging them, yielding a final score between 1 and 5. In this study, the validity of this instrument has been confirmed by nine experts, yielding a CVI of 0.94 and a CVR of 0.92. Moreover, the Cronbach's alpha coefficient was found to be 0.92, demonstrating excellent internal consistency.

2.3. Procedure

In the implementation phase, initial coordination was established with the Education Department to obtain the necessary permissions. Following this, a visit to the school was conducted to explain the research objectives and the significance of the findings, ensuring the consent of both parents and students. Subsequently, a sample of 384 high-school students was selected using a convenience sampling method, and they were provided with questionnaires to complete. Finally, the completed questionnaires were collected for analysis.

2.4. Statistical Analysis

For the analysis of the collected data, descriptive statistics were employed, utilizing measures of central tendency and dispersion, including mean, standard deviation, skewness, and kurtosis. In the inferential statistics section, structural equation modeling was applied, following the assessment of the necessary assumptions. The analysis was conducted using the Smart PLS statistical software version 4 at a significance level of 0.05.

3. Results

Table 1 illustrates the characteristics of FL, mental health and PA. Additionally, the skewness and kurtosis values for all variables range between -2 and +2, indicating that the assumption of normal distribution for the data is satisfied.

Table 1. Description of Research Variables.

	Skewness	Kurtosis	Mean	SD	Maximum	Minimum
Financial Literacy	0.275	0.560	2.17	0.15	4	1
Mental Health	-1.02	0.119	63.58	4.74	105	34
Physical Activity	-1.32	-0.105	2.08	0.24	4	1

Table 2 revealed that the Cronbach's alpha values for FL was 0.92, mental health was 0.91, and PA was 0.78. Additionally, the composite reliability for FL was 0.92, mental health was 0.91, and PA was 0.81. Finally, the average variance extracted (AVE) for FL was 0.65, for mental health was 0.55, and for PA was 0.54. These values exceed acceptable thresholds, indicating that the questionnaires utilized demonstrated satisfactory reliability and validity.

Table 2. Validity and Reliability.

	Cronbach's Alpha	Composite Reliability	AVE
Financial Literacy	0.924	0.928	0.655
Mental Health	0.919	0.914	0.553
Physical Activity	0.787	0.811	0.544

The results revealed a significant positive correlation between FL and mental health ($P < 0.001$, $r = 0.43$), as well as between PA and mental health ($P < 0.001$, $r = 0.53$). Additionally, a positive relationship was found between FL and PA ($P < 0.001$, $r = 0.25$). These findings support the validity of the assumption of a linear relationship among the variables. Furthermore, the variance inflation factor (VIF) values for the research variables were all below the threshold of 10, indicating the absence of multicollinearity among them.

The path analysis results obtained through Smart PLS software, as presented in Table 3, indicate a significant positive structural relationship between mental health (P=0.000, t=9.35, b=0.46) and PA (P=0.000, t=5.86, b=0.30) in relation to FL. Additionally, a significant positive structural relationship exists between PA and mental health (P=0.000, t=4.18, b=0.26).

Table 3. Structural Model Coefficients and Values for the Direct Path.

Path	b	SE	t-Value	P-Value
Financial Literacy => Mental Health	0.465	0.050	9.35	0.000
Financial Literacy => Physical Activity	0.309	0.053	5.86	0.000
Physical Activity => Mental Health	0.265	0.063	4.18	0.000

The results presented in Table 4 indicate that PA serves as a significant mediating factor in the relationship between FL and mental health, with a p-value of 0.000, a t-value of 3.82, and a b coefficient of 0.12.

Table 4. Structural Model Coefficients and Values for the Indirect Path.

Indirect Path	b	SE	T	P
Financial Literacy => Physical Activity => Mental Health	0.12	0.032	3.82	0.000

The Stone-Geisler Q^2 index values presented in Table 5 are all positive, indicating that the structural model demonstrates good quality. The model exhibits strong predictive power for the endogenous latent variables, with an R^2 value of 0.39 for FL, meaning it accounts for 39 percent of the variance in this variable. Additionally, the SRMR value of 0.075 is below the acceptable threshold of 0.08, and the goodness of fit index (GOF) for the overall model assessment is 0.37, surpassing the minimum criterion of 0.36. These results collectively suggest that the model fits well.

Table 5. Model Fit Indices.

	Q^2	R^2	SRMR	GOF
Financial Literacy	0.249	0.388	0.75	0.37
Mental Health	0.30	0.070		
Physical Activity	-			
Acceptable Value	Be positive		<0.8	>0.36

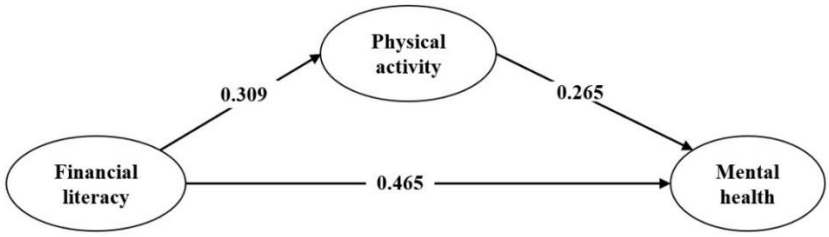

Figure 1. Standardized Coefficients of Paths.

4. Discussion

The relationship between FL and the mental health of adolescents remains largely unexamined in existing literature. Furthermore, the essential role of PA, known to significantly influence mental well-being, has not been investigated within this framework. Consequently, this study seeks to analyze the connections between FL and adolescent mental health, while also considering the mediating effect of PA. The path analysis results indicated a significant positive structural relationship between FL with mental health and PA. Additionally, a significant positive structural relationship exists between PA and mental health. Finally, the results indicated that PA serves as a significant mediating factor in the relationship between FL and mental health.

FL components are essential tools for enhancing students' capabilities and serve as prerequisites for improving mental health and quality of life. Elevating students' FL is crucial, as greater access to financial information correlates with improved well-being and living standards (30). Acquiring FL equips individuals to make fewer financial mistakes and achieve greater financial stability, thereby reducing their exposure to stressful situations. Furthermore, FL increases students' chances of attaining financial security (7). In times of national financial crises, individuals with higher levels of FL are less likely to experience shock, as they possess a financial safety net, even if it is modest. A person's FL, defined as their ability to effectively utilize financial knowledge and skills for managing their monetary resources, significantly influences their understanding of behaviors such as budgeting, saving, and establishing a financial safety net. Consequently, individuals with higher FL are more likely to engage in prudent financial practices while avoiding detrimental behaviors, such as excessive reliance on credit (31).

In addition, increasing FL is associated with a reduction in financial stress. A lack of knowledge and awareness in the realm of financial health can lead to heightened anxiety and a decline in overall quality of life. Chronic or long-term financial problems are a significant source of stress for many individuals, often surpassing the anxiety caused by political issues, family dynamics, and work-related pressures (30,32). This financial strain can lead to heightened feelings of anxiety and depression, ultimately causing individuals to feel overwhelmed and isolated in their struggles. Hence, enhancing the quality of life through strategies such as increasing awareness and knowledge about financial matters can significantly reduce anxiety among students (33).

Moreover, financially literate individuals, or those with a solid understanding of investments, are more likely to prioritize their health through regular exercise (9,17,34). This correlation suggests that enhancing FL could lead to better health choices, prompting Japanese policymakers to consider initiatives aimed at improving financial education as a strategy to address pressing health concerns, such as insufficient PA.

The emphasis on the relationship between FL and mental health outcomes carries significant implications for policy development (8,18,35). Due to the fact that overall scores of this study sample were relatively low, necessitating ongoing monitoring and improvement efforts (8). To address this, government agencies and financial institutions must enhance the dissemination of financial knowledge, improve the effectiveness of educational initiatives, and utilize diverse media platforms, including the Internet and television, to reach a broader audience (18). Additionally, encouraging residents to engage more actively in the financial market can facilitate practical learning and elevate their FL. Ultimately, enhancing FL is crucial not only for individual financial well-being but also for improving overall health and quality of life, which can be further supported by strengthening the medical and health service infrastructure and expanding the range of available medical insurance options (35).

Research has established a link between financial difficulties and mental health issues, with a notable rise in cases among young people. This highlights the necessity of focusing on this demographic. From a societal standpoint, it is crucial to foster discussions around "financial health," particularly among

professionals such as psychologists, psychiatrists, and social workers who encounter individuals facing financial challenges. Furthermore, there is a pressing need to create more accessible and direct connections between financial advisory services and the healthcare system, including primary care and psychiatric services.

This study faced several limitations that warrant consideration. Firstly, the focus on adolescents may limit the generalizability of the findings to other age groups, such as children, suggesting a need for future research to include younger populations. Furthermore, the reliance on questionnaires to assess variables like PA introduces the potential for self-reporting bias. To enhance accuracy, subsequent studies should incorporate device-based measures for PA assessment. On a positive note, this research highlighted significant strengths, particularly in its exploration of physical literacy, an area that has not been thoroughly investigated in prior studies.

4.1. Conclusion

FL has become an increasingly vital subject, particularly as many individuals face challenging economic conditions marked by elevated inflation rates. The evolution of the financial market, characterized by a proliferation of payment options, underscores the necessity of understanding financial principles. Effective long-term savings and capital management are crucial for ensuring a comfortable retirement and creating a financial cushion for unexpected expenses. Individuals with limited FL may struggle to make sound financial choices, and the prevalence of various subscription services and easily accessible consumer loans can exacerbate the risk of significant financial distress.

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Footnotes

Authors' Contribution: This study was carried out solely by the corresponding author.

Conflicts of Interest

Non to declare.

Data Availability: The data that support the findings of this study are openly available upon request from the corresponding author.

Ethical Approval: The author confirms that all steps and requirements of this study comply with ethical guidelines. Participants were informed about the characteristics of the study and gave written informed consent.

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