

Determinants of Health-Promoting Behaviors Among Indonesian Adolescents Living in Child Welfare Institutions: A Structural Equation Modeling Study

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Abstract

Background: Adolescents in child welfare institutions often experience challenges in adopting health-promoting behaviors (HPB), which leads to significant health vulnerabilities.

Objective: This study aimed to identify the HPB of adolescents in child welfare institutions and the determinants influencing them, using the Health Promotion Model.

Methods: A cross-sectional design was employed. A total of 276 adolescents from 17 child welfare institutions in East Java Province, Indonesia, participated in this study. Structural equation modeling was utilized to examine the relationships among the determinants.

Results: HPB had a positive correlation with health literacy ($r=0.13$, $P<.05$), self-esteem ($r=0.31$, $P<.001$), perceived self-efficacy ($r=0.66$, $P<.01$) and social support ($r=0.53$, $P<.01$), and a negative correlation with perceived barriers to action ($r=-0.15$, $P<.05$). In the final model, both perceived self-efficacy and social support accounted for 47.9% of HPB. In addition, perceived barriers to action were influenced by health literacy ($\beta=-0.234$, $P<.001$), self-esteem ($\beta=-0.194$, $P<.01$), and perceived self-efficacy ($\beta=-0.185$, $P<.01$). Self-esteem indirectly affected HPB through perceived self-efficacy ($\beta=0.099$, $P<.01$) and social support ($\beta=0.078$, $P<.001$).

Conclusions: To improve the HPB of adolescents in these institutions, their self-esteem needs to be increased in order to further enhance their self-efficacy and social support. Careful attention and monitoring of HPB among these adolescents may lead to better health outcomes and support their transition from child welfare institutions to the broader community.

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Original Manuscript

Original Paper

Determinants of Health-Promoting Behaviors Among Indonesian Adolescents Living in Child Welfare Institutions: A Structural Equation Modeling Study

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Abstract

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Objective: This study aimed to identify the HPB of adolescents in child welfare institutions and the determinants influencing them, using the Health Promotion Model.

Methods: A cross-sectional design was employed. A total of 276 adolescents from 17 child welfare institutions in East Java Province, Indonesia, participated in this study. Structural equation modeling was utilized to examine the relationships among the determinants.

Results: HPB had a positive correlation with health literacy ($r=0.13$, $P<.05$), self-esteem ($r=0.31$, $P<.001$), perceived self-efficacy ($r=0.66$, $P<.01$) and social support ($r=0.53$, $P<.01$), and a negative correlation with perceived barriers to action ($r=-0.15$, $P<.05$). In the final model, both perceived self-efficacy and social support accounted for 47.9% of HPB. In addition, perceived barriers to action were influenced by health literacy ($\beta=-0.234$, $P<.001$), self-esteem ($\beta=-0.194$, $P<.01$), and perceived self-efficacy ($\beta=-0.185$, $P<.01$). Self-esteem indirectly affected HPB through perceived self-efficacy ($\beta=0.099$, $P<.01$) and social support ($\beta=0.078$, $P<.001$).

Conclusions: To improve the HPB of adolescents in these institutions, their self-esteem needs to be increased in order to further enhance their self-efficacy and social support. Careful attention and monitoring of HPB among these adolescents may lead to better health outcomes and support their transition from child welfare institutions to the broader community.

Keywords: Adolescents; Health-Promoting Behaviors; Child Welfare Institutions; Indonesia

Introduction

Adolescents living in child welfare institutions—commonly referred to as orphanages or childcare institutions—face unique challenges that may adversely affect their overall health and well-being. These adolescents are more prone to experiencing physical, mental, and social difficulties compared to their peers living in family environments [1]. Furthermore, these challenges can lead to hopelessness and hinder their ability to thrive [2].

Health-promoting behaviors (HPB) refer to individuals' actions and choices to improve their health and prevent the occurrence of diseases [3]. The World Health Organization emphasizes HPB as a key strategy for improving health outcomes and enhancing quality of life [4]. During adolescence, engagement in HPB is linked to improved academic performance, stronger interpersonal relationships, and a lower risk of future chronic diseases [5]. Thus, adopting HPB in adolescents is not only beneficial for the present but also serves as a crucial investment in their future health and well-being.

Although HPB have many advantages, barriers to its adoption exist for adolescents in child welfare institutions. The unavailability of facilities and lack of caregiver support to fulfil their physical and psychological needs can lead to poor decision-making skills and low self-esteem [6]. In addition, low levels of awareness and accessibility to health services due to poor government registration coverage and national health insurance may further restrict HPB [7].

This is especially true in the Indonesian context, which has its own challenges. Owing to family economic hardship, adolescents are placed in child welfare institutions with the expectation that they will be adequately cared for and educated [8]. However, the vast majority of institutions in Indonesian are private and fall short of government oversight and support, suggesting that they do not always comply with national care standards [9]. Consequently, adolescents living in such conditions become more susceptible to unhealthy behaviors, such as smoking, poor sleep quality, low physical activity levels, and difficulties maintaining well-being [10].

Despite the recognition of the importance of HPB during adolescence, research on the factors that influence HPB among adolescents living in child welfare institutions in Indonesia is lacking. The Health Promotion Model (HPM), developed by Pender et al.[3], has often been used to identify the relationship between relevant factors in the adolescent population. The HPM encompasses three interconnected domains: individual characteristics and experiences, behavior-specific cognitions and affect, and behavioral outcomes. Individual characteristics, such as prior behavior, health literacy, self-esteem, and sociodemographic factors, significantly shape subsequent actions, with their impact varying depending on the specific behavior being considered. Behavior-specific cognitions and affect—including perceived benefits and barriers to action, perceived self-efficacy, activity-related affect, and interpersonal and situational influences—are highly motivational. These factors can be modified through targeted interventions, making their measurement essential for evaluating intervention effectiveness. HPB, as described in the HPM, serve as the endpoint aimed at achieving positive health outcomes.

In this study, we examined health literacy and self-esteem as components of the individual characteristic's domain. Perceived barriers to action, perceived self-efficacy, and social support as elements of the behavior-specific cognitions domain. Lastly, HPB as behavioral outcomes to understand their influence on HPB among vulnerable adolescents. We also hypothesize that perceived self-efficacy and social support have a positive correlation with HPB, whereas perceived barriers to action is negatively correlated with HPB. The findings of the study will provide insight into the challenges and opportunities for promoting HPB in this population by identifying the determinants of HPB using a structural equation model (SEM).

Methods

Study Design and Participants

This study utilized a cross-sectional design. Conducted in January and February 2024, the study took place in 17 child welfare institutions in Malang City, Indonesia. We included adolescents aged 13–18 living in child welfare institutions for at least six months and were willing to participate. Adolescents who have developed mental or physical disabilities were excluded. Among the 280 adolescents participated, four were excluded for selecting the same response to every question. The final analysis included 276 participants.

Ethical Considerations

The Institutional Review Board (IRB) of the Institute of Technology, Science and Health Soepraoen in Malang City, Indonesia, approved the study (approval number KEPK-EC-10/XII/2023). As adolescents are a vulnerable group and require guardian consent for their participation, the head of the child welfare institutions provided written consent and all participants were asked to indicate assent before data collection.

General Participant Demographics

General information about the participants was collected using a form developed by the researchers to determine their age (in years), duration living in child welfare institutions (in years), sex (boy/girl), education (primary/junior high/senior high school/undergraduate), orphan status (maternal orphan/paternal orphan/double orphan/not orphan), and accreditation level of child welfare institutions (A/B/C/Unaccredited). Indonesian child welfare institutions receive accreditation ratings of A (excellent), B (good), C (satisfactory), or are unaccredited, signifying varying degrees of compliance with national standards for child welfare services. Higher ratings indicate greater capacity to provide quality care within an institution.

HPB Assessment

HPB imply actions taken by adolescents to improve and maintain their health in a child welfare institution environment and measured by the Adolescent Lifestyle Profile-Revised 2 (ALP-R2) [11]. This instrument has 44 items which measure seven domains of HPB: health responsibility, physical activity, nutrition, positive life perspective, interpersonal relationships, stress management, and spiritual health. The items were rated using a 4-point Likert scale (1=never, 2=sometimes, 3=often, 4=always), with a total possible score of from 44 to 176. The higher the score, the better the adolescents' HPB. The overall Cronbach's alpha was 0.86 in this study.

Health Literacy

Health literacy entails adolescents' ability to seek, understand, evaluate, and use health information to make informed decisions about their health, and was measured by the Health Literacy Assessment Scale for Adolescents (HAS-A) [12]. This 15-item instrument is subcategorized into communication, confusion, and functional health literacy scale. The items were measured using a 5-point Likert scale (5=never, 1=always), with a total possible score ranging from 15 to 75. The higher the score, the higher the adolescents' health literacy. The Cronbach's alpha was 0.70 in this study.

Self-Esteem

Self-esteem refers to adolescents' self-perception and assessment of their personal worth and abilities. The Rosenberg Self-Esteem Scale [13], which has been adapted to the Indonesian context [14], was used to measure self-esteem. This instrument has eight items that are rated using a 4-point Likert scale (1=strongly disagree, 2=disagree, 3=agree, 4=strongly agree for questions 1, 2, 3, 6, and 8, with reverse scoring for questions 4, 5, 7) with a total possible score of 8–32. The higher the score, the higher the adolescents' self-esteem. In this study, Cronbach's alpha was 0.68.

Perceived Barriers to Action

Perceived barriers to action imply adolescents' perceptions of the barriers or obstacles that prevent them from performing HPB and were identified using the Barriers to Health Promoting Activities scale [15]. This 18-item instrument was rated using a 4-point Likert scale (1=never, 4=routinely), with a total possible score of 18–72. The higher the score, the higher the adolescents' perceived barriers to HPB. In this study, Cronbach's alpha was 0.85.

Perceived Self-Efficacy

Perceived self-efficacy entails adolescents' belief in their own ability to perform and maintain HPB and was identified using the Self-Rated Abilities for Health and Practices Scale–Adolescent Version (SRAHP-A) [16]. This instrument has 28 items, subcategorized into four scales: nutrition, psychological well-being, exercise, and responsible health practices. This instrument was rated using a 5-point Likert scale (1=cannot do at all, 2=a little, 3=somewhat, 4=mostly, 5=certainly can do), with a total possible score of 28–140. The higher the score, the higher the adolescents' perceived self-efficacy. In this study, Cronbach's alpha was 0.92.

Social Support

Social support implies the emotional, instrumental, appraisal, and informational support adolescents receive from caregivers, peers, and friends that assist them in performing HPB. The original Child and Adolescent Social Support Scale for Healthy Behaviors (CASSS-HB) [17] assessed social support (emotional, informational, instrumental, and appraisal) for healthy behaviors in children and adolescents from parents, teachers, classmates, close friends, and people in school. For this study, we adapted the instrument to focus on three sources of support: caregivers, peers, and friends living in child welfare institutions. This instrument has 36 items and two subscales. Frequency responses were rated with a 6-point Likert scale (1=never, 6=always), and importance responses were rated with a 3-point Likert scale (1=not important, 2=important, 3=very important), with a total possible score of 72–324. The higher the score, the greater the adolescents' social support. Cronbach's alpha was 0.96 in this study.

The five questionnaires (ALP-R2, HAS-A, The Barriers to Health Promoting Activities Scale, SRAHP-A, and CASSS-HB) were translated to Indonesian using forward-backward translation techniques before being used [18].

Statistical Analysis

IBM SPSS Statistics 26.0 (Chicago, IL, USA) was used to perform descriptive analyses of variables,

internal consistency tests, independent t-tests, one-way analysis of variance, Pearson's correlation, and post-hoc analysis. IBM AMOS 26.0 software was used for path analysis to analyze the regression coefficient and effects (direct, indirect, and total) among the variables and evaluate the structural model fit.

The determinants of HPB among adolescents living in child welfare institutions were further identified using SEM. In this study, six variables included in the model were observed variables with a single indicator. The two exogenous variables - health literacy and self-esteem – served as independent variables or predictors of the other observed variables in the model. The four endogenous variables were perceived barriers to action, perceived self-efficacy, social support, and HPB. HPB were identified as the outcome of the model, while perceived barriers to action, perceived self-efficacy, and social support were identified as mediators between the exogenous variables and HPB. Figure 1 represents the hypothesized model for the study.

A SEM was used to test the hypotheses. First, the model was identified, followed by an evaluation of its overall fit. The number of distinct sample moments in this model was 21, and the number of distinct parameters to be estimated was 18. Therefore, the degree of freedom (df) was calculated as $21-18=3$. Since the df was positive, a minimum was achieved, allowing for further testing [19]. Four tests were used to assess the goodness of fit: Tucker–Lewis Index (TLI, >0.90), comparative fit index (CFI, >0.90), standardized root mean square residual (SRMR, <0.08), and root mean square error of approximation (RMSEA, <0.08) [20]. Bootstrapping analysis with 5,000 samples and 95% bias-corrected confidence intervals was used to determine the significance of both indirect and direct effects.

Results

Participants' Demographic and HPB Analysis

Of the 276 participants, 54% were female, with most (56.2%) aged between 13–15 years and a mean age of 15.3 (standard deviation [SD] ± 1.7) years. Additionally, 43.1% were in senior high school, whereas 42.8% were in junior high school. About half of the participants (51.1%) were not orphans and 60.9% had been living in child welfare institutions for 1–3 years, with a mean of 3.4 ± 2.5 years. Based on the post-hoc analysis, primary school students had lower HPB scores than college students ($P < .05$). HPB were higher among those living in institutions for 1–3 and 4–5 years compared to those living more than 5 years ($P < .05$). Adolescents in level B institutions had higher HPB scores than those living in level C institutions ($P < .05$), and adolescents living in unaccredited institutions had higher HPB scores than those living in level C institutions ($P < .05$).

Table 1. Demographics of participants and health-promoting behavior scores

Variables	Categories	Frequency	Mean $\pm$ SD	HPB
Age	13–15 years	155 (56.2%)	15.3 $\pm$ 1.7	122 $\pm$ 15
	16–18 years	121 (43.8%)		125 $\pm$ 12.6
Sex	Male	127 (46.0%)		124.2 $\pm$ 14.3
	Female	149 (54.0%)		122.5 $\pm$ 13.9
Education	Primary school	28 (10.1%)		116.8 $\pm$ 13.1 ^a
	Junior high school	118 (42.8%)		123.6 $\pm$ 14.7
	Senior high school	119 (43.1%)		125 $\pm$ 13.4 ^a
	College	11 (4.0%)		118.3 $\pm$ 12.5
Orphan status	Not orphan	141 (51.1%)		124.2 $\pm$ 14.1

	Maternal orphan	23 (8.3%)		120.9±13.9
	Paternal orphan	88 (31.9%)		123.8±14.5
	Double orphan	24 (8.4%)		119±11.5
Years living in child welfare institutions	1–3 years	168 (60.9%)	3.4±2.5	123.6±14 ^a
	4–5 years	77 (27.9%)		125.2±14.1 ^a
	> 5 years	31 (11.2%)		117±13.3 ^a
Accreditation of child welfare institutions	A	20 (7.2%)		117.3±15
	B	125 (45.3%)		125.5±13.4 ^a
	C	51 (18.5%)		118.2±13.9 ^a
	Unaccredited	80 (29%)		124.7±14 ^a

^a $P<.05$

HPB: health-promoting behavior

HPB and Significant Determinants

The correlation analysis showed that HPB had a significant positive correlation with perceived self-efficacy ($r = 0.66$, $P < .01$), social support ($r = 0.53$, $P < .01$), health literacy ($r = 0.13$, $P < .05$), and self-esteem ($r = 0.31$, $P < .01$). Conversely, HPB showed a negative correlation with perceived barriers to action ($r = -0.15$, $P < .05$).

The model in this study indicated a good fit, with indicators including a TLI of 0.947, CFI of 0.989, SRMR of 0.000, and RMSEA of 0.070. The results of the SEM analysis (table 2) showed that in the path of HPB, perceived self-efficacy ($\beta = 0.538$, $P < .001$) and social support ($\beta = 0.256$, $P < .001$) had a significant positive correlation with HPB. These variables explained 47.9% of HPB. In the path of perceived barriers to action, health literacy ($\beta = -0.234$, $P < .001$), self-esteem ($\beta = -0.194$, $P < .01$), and perceived self-efficacy ($\beta = -0.185$, $P < .01$) had a significant negative correlation with perceived barriers to action. In the path of perceived self-efficacy, self-esteem ($\beta = 0.184$, $P < .001$) and social support ($\beta = 0.473$, $P < .001$) had a significant positive correlation with perceived self-efficacy. In the path of social support, only self-esteem ($\beta = 0.303$, $P < .001$) had a significant positive correlation with social support.

Table 2. Effect coefficients of the model

Dependent variables	Independent variables	Direct effects (β)	Indirect effects (β)	Total effects (β)	SMC ^d
HPB	Perceived barriers to action	0.065		0.065	0.479
	Perceived self-efficacy	0.538 ^c	-0.012	0.526 ^c	
	social support	0.256 ^c	0.249 ^c	0.505 ^c	
Perceived barriers	Perceived self-efficacy	-0.185 ^b		-0.185 ^b	0.188

Dependent variables	Independent variables	Direct effects (β)	Indirect effects (β)	Total effects (β)	SMC ^d
to action	Social support		-0.088 ^b	-0.088 ^b	
	Health Literacy	-0.234 ^b	-0.013	-0.247 ^c	
	Self-esteem	-0.194 ^b	-0.061 ^b	-0.254 ^c	
Perceived self-efficacy	Health literacy	0.098	-0.029	0.069	0.328
	Self-esteem	0.184 ^b	0.143 ^c	0.327 ^b	
Social support	Social support	0.473 ^c		0.473 ^c	0.086
	Health literacy	-0.061		-0.061	
	Self-esteem	0.303 ^c		0.303 ^c	

^a $P < .05$

^b $P < .01$

^c $P < .001$

^dSMC: squared multiple correlations

HPB: health-promoting behavior

There were no significant ($P > .05$) indirect effects of health literacy on HPB through perceived barriers to action, perceived self-efficacy, and social support. However, there was a significant indirect effect of self-esteem on HPB through perceived self-efficacy ($\beta = 0.099$, $P < .001$), through social support ($\beta = 0.078$, $P < .001$), and through social support and perceived self-efficacy ($\beta = 0.077$, $P < .001$). The final model of HPB among adolescents living in child welfare institutions in Indonesia is presented in Figure 2.

Discussion

Principal Results

This study explored the determinants of HPB among adolescents living in Indonesian child welfare institutions. The SEM analysis revealed that both perceived self-efficacy and social support accounted for 47.9% of adolescents' HPB in this study. HPB are key to happiness and a good quality of life, and self-efficacy increases HPB at every stage of life [21]. When people have confidence in their ability to perform HPB, they will make more effort to engage in these behaviors [4]. In child welfare institutions with more structured in their activities, perceived self-efficacy and social support appear to play a crucial role in the development of good HPB in adolescents living in these institutions.

The study challenges existing frameworks by highlighting that perceived barriers are not significant to HPB in this context, providing insights into the unique needs of these adolescents. This finding aligns with those from Thailand [22]. This could be attributed to the unique environment of child welfare institutions, where structured activities and support systems mitigate the barriers typically faced by adolescents living with their families. The organized nature of these institutions—with regulated schedules and caregiver supervision—can encourage adolescents to engage in HPB, often leaving health decision-making to caregivers and the institution.

Interestingly, health literacy did not correlate with perceived self-efficacy in this study. This finding differs from studies from Australia, China, Turkey, and Germany, which found a positive correlation between health literacy and adolescent self-efficacy [23]. This discrepancy may be due to adolescents in child welfare institutions having moderate health literacy but lacking confidence in

performing HPB. In general, adolescents not fully independent at this stage and often lack autonomy in their activities, as well as practical experience in carrying them out [24].

In addition, this study has identified the link between self-esteem, social support, and perceived self-efficacy with HPB, a connection that has emerged in recent literature on this unique population. It can provide a foundation for health professionals to develop interventions that address HPB by improving self-esteem and enhancing social support for targeted adolescents like those in this study.

Comparison with Prior Work

No prior studies—to our knowledge—have examined HPB among adolescents living in child welfare institutions. Much of the existing research has focused on healthy adolescent populations, with studies conducted in Turkey [25], Portugal [26], Iran [27], and India [28]. However, this study explored HPB among a specific group of adolescents—those living in child welfare institutions, which has been understudied in Indonesia and other countries. This study also highlights several factors under the Health Promotion Model that influence HPB, providing a comprehensive understanding of the determinants of these behaviors.

The study found that self-esteem had a significant indirect effect on HPB through perceived self-efficacy and social support. This supports previous studies indicating that higher self-esteem improves perceived self-efficacy, which is crucial for problem-solving and adopting HPB [29, 30]. Individuals with high self-esteem tend to have greater perceived self-efficacy in problem-solving [31, 32].

The study also found that only self-esteem showed a significant positive correlation with social support and indirectly affects HPB by enhancing perceived self-efficacy and social support. Higher self-esteem leads to more active social engagement, thereby increasing perceived social support [33]. In the present study, self-esteem was moderate, consistent with previous studies showing that self-esteem in adolescents living in child welfare institutions is generally low or moderate [34]. Hence, interventions to improve self-esteem could enhance social support and, consequently, HPB. In child welfare institutions, fostering a nurturing environment that enhances self-esteem and interpersonal relationships can be used to boost adolescents' perceived self-efficacy, thereby promoting positive HPB.

The study also confirmed that social support is positively correlated with perceived self-efficacy, which helps reduce perceived barriers to action. This findings align with a study from the USA, which showed that higher perceived self-efficacy reduces perceived barriers to physical activity—a component of HPB [35]. More significant social support leads to higher perceived self-efficacy and fewer perceived barriers. Given the limited studies on this topic—especially among adolescents—this study provides valuable insights into the relationships between social support, self-esteem, perceived self-efficacy, and perceived barriers to action.

The key finding of this study revealed a nuanced relationship between health literacy and HPB among adolescents in child welfare institutions. Surprisingly, health literacy did not significantly influence perceived self-efficacy or social support, suggesting that the structured environment of these institutions provided consistent information and support, reducing reliance on individual health literacy. However, lower health literacy significantly increased perceived barriers to action, indicating that even within a supportive environment, understanding health information is crucial for overcoming challenges. The structured environment of the institutions mitigated the negative impact of these perceived barriers on HPB, suggesting that consistent support and resources can buffer the effects of perceived obstacles. These findings underscore the need for interventions that enhance health literacy, empowering adolescents to overcome barriers while leveraging the supportive nature of structured environments in child welfare institutions to promote healthier behaviors and improve their overall well-being.

Limitations

Despite our best efforts, a few limitations exist in this study. First, convenience sampling methods was used in only a single city, so generalizing the findings should be done with caution. Second, because half of the participants had at least one parent, social support from parents, which was not assessed, may have influenced the levels of their social support. Third, there were no confirmatory factor analyses conducted on the translated instruments, which may have impacted the validity of the measures. Finally, although research assistants were trained to ensure consistent interpretation of instruments, periodic meetings were not held to calibrate interpretations or address issues during data collection. This may have affected the reliability and accuracy of the data collection process.

Conclusions

Based on the HPM and tested through SEM analysis, both perceived self-efficacy and social support directly affected HPB, while self-esteem indirectly affected HPB among adolescents in child welfare institutions in Indonesia. Additionally, health literacy only influenced perceived barriers to action, but these perceived barriers to action did not contribute to HPB. Our study key findings contribute to the development of health interventions aimed at improving and maintaining HPB among adolescents living in child welfare institutions in Indonesia. We hope that these interventions will lead to improved health outcomes and quality of life for these individuals as they transition into adulthood and move from child welfare institutions to the broader community.

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Conflicts of Interest

None declared.

Abbreviations

ALP-R2: Adolescent Lifestyle Profile-Revised 2

CASSS-HB: Child and Adolescent Social Support Scale for Healthy Behaviors

CFI: comparative fit index

df: degree of freedom

HAS-A: Health Literacy Assessment Scale for Adolescents

HPB: health-promoting behaviors

HPM: Health Promotion Model

RMSEA: root mean square error of approximation

SD: standard deviation

SEM: structural equation model

SRAHP-A: Self-Rated Abilities for Health and Practices Scale–Adolescent Version

SRMR: standardized root mean square residual

TLI: Tucker–Lewis Index

Data availability

The datasets generated or analyzed during this study are available from the corresponding author upon reasonable request.

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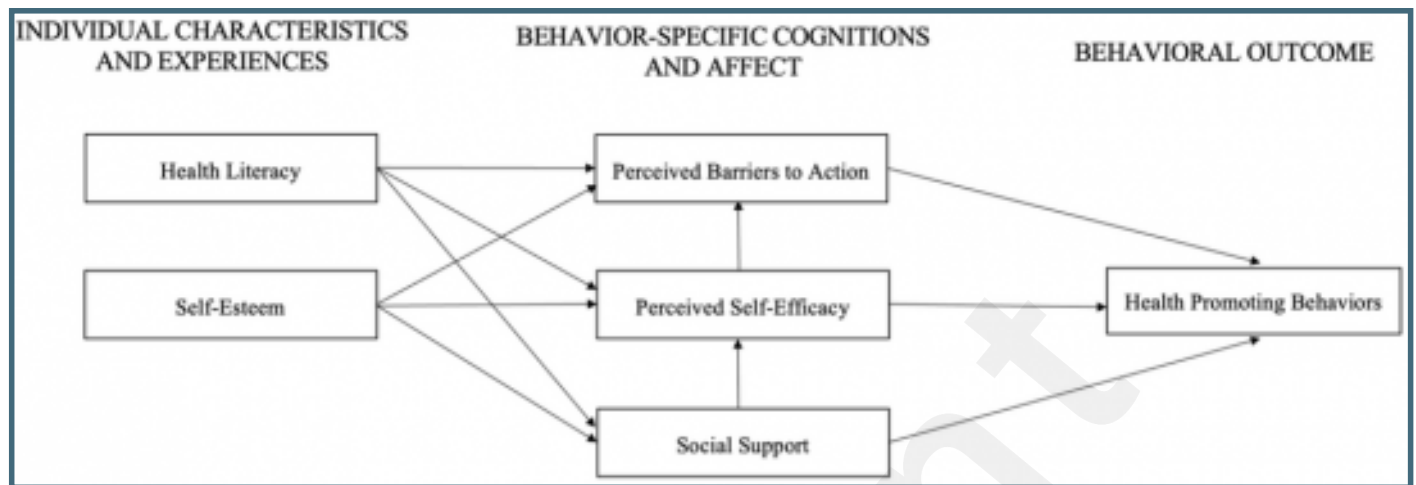
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Supplementary Files

Figures

Hypothesized model.



Path coefficient diagram of the final model.

