

Relationships between General Health, Sport Participation Motives, Physical Activity, and Happiness among Women in Isfahan City, Iran

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Original Article

Abstract

Introduction: Physical inactivity among women is a multifactorial phenomenon in which general health status, motives for sport participation, and experience of positive outcomes from physical activity may contribute to the formation of happiness. The present study aimed to examine a structural model of the relationships between general health, sport participation motives, physical activity, and happiness among women in Isfahan City, Iran.

Materials and Methods: In this cross-sectional, descriptive-correlational study, 395 women aged 15–65 years were selected through multistage cluster sampling. Data were collected using the 30-item Participation Motivation Questionnaire (PMQ), the 28-item General Health Questionnaire (GHQ), a modified 29-item version of the Oxford Happiness Questionnaire (OHQ), and two self-reported indicators of physical activity: weekly session frequency and duration. Data were analyzed using SPSS and SmartPLS software. The measurement model was evaluated by assessing reliability, convergent validity, and discriminant validity. Subsequently, the structural model was evaluated using path coefficients, R^2 , f^2 , and effect sizes.

Results: Higher scores on general health problems were associated with lower sport participation motives ($\beta = -0.177$, $P = 0.001$). Sport participation motives were positively associated with physical activity ($\beta = 0.474$, $P = 0.001$), which in turn was positively associated with happiness ($\beta = 0.290$, $P = 0.001$). The serial indirect association between general health and happiness, mediated by sport participation motives and physical activity, was statistically significant but small ($\beta = -0.024$, $P = 0.007$). The model explained 3.1%, 2.5%, and 8.4% of the variance in sport participation motives, physical activity, and happiness, respectively.

Conclusion: The findings supported a modest structural chain linking general health problems, sport participation motives, physical activity, and happiness, with the strongest association observed between participation motives and physical activity. Programs aimed at promoting physical activity in women may benefit from addressing health-related constraints while fostering meaningful and enjoyable motives for participation. Given the cross-sectional design of this study, results indicate statistical associations and should not be interpreted causally.

Keywords: General health; Sport participation motives; Physical activity; Happiness; Women; Structural equation modeling

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Introduction

Regular physical activity is a cornerstone of health promotion and the prevention of noncommunicable diseases, and the World Health Organization emphasizes its importance throughout the life course and in accordance with individuals' abilities (1). Nevertheless, national data from Iran indicate that physical inactivity remains an important public health

concern and that patterns of physical activity differ by sex and age (2). Among women, participation in physical activity is not simply a consequence of awareness of the benefits of exercise; rather, it is shaped through the interplay of health status, experienced barriers, access, social support, personal preferences, and reasons for participation. A systematic review of studies among women in countries in the region

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likewise showed that individual and social factors, health beliefs, environmental constraints, and opportunities for access may simultaneously influence women's levels of physical activity (3).

One important link between individual circumstances and actual behavior is motivation—the set of reasons that prompt a person to initiate and maintain participation in sport. The Participation Motivation Questionnaire (PMQ) was developed from an empirical approach to identifying reasons for sport participation and covers motives such as achievement, teamwork, fitness, energy release, situational factors, skill development, friendship, and fun (4). Other instruments within the broader physical-activity motivation literature have also been developed for different populations and contexts; for example, the Physical Activity and Leisure Motivation Scale (PALMS) was designed as a distinct measure of motives for participation in physical activity and sport (5). At a broader theoretical level, evidence based on Self-Determination Theory indicates that perceived competence and more autonomous forms of motivation, including intrinsic motivation and identified regulation, are associated with higher levels of physical activity and better maintenance of active behavior (6,7). In Iran, an intervention study among middle-aged women also showed that strengthening motivational beliefs and self-efficacy may be accompanied by substantial increases in physical activity (8).

Health status may also play either a constraining or facilitating role in this process. The 28-item General Health Questionnaire (GHQ-28) is primarily used to screen for psychological distress across four domains: somatic symptoms, anxiety and sleep disturbance, social dysfunction, and depressive symptoms. Accordingly, a higher GHQ-28 score indicates greater general/mental health problems rather than better health. The validity and reliability of the Persian GHQ-28 have also been reported in Iranian populations (9,10). From a behavioral perspective, somatic symptoms, sleep disturbance, anxiety, or reduced social functioning may increase the perceived cost of participating in sport and reduce motivation to be active; nevertheless, health status alone is unlikely to account for all motivational differences.

In addition to its physical outcomes, physical activity is associated with positive affect, life satisfaction, and happiness. A systematic review of everyday-life studies showed that even brief episodes of physical activity may be associated with better affective well-being. However, the magnitude and direction of these associations depend on population

characteristics, context, and measurement approach, and the issue of causality remains unresolved (11). More recent studies have likewise reported positive associations between physical activity and subjective well-being and have highlighted the roles of social support and self-efficacy in this relationship (12). In a large population-based study, participation in exercise was associated with greater happiness, although demographic differences and the possibility of a bidirectional relationship between exercise and happiness were emphasized (13).

Direct evidence is also available from Iran. In a study of Iranian adults, individuals with more active leisure time reported greater happiness, and a modified 29-item measure, based on the Oxford Happiness Questionnaire, was used to assess it (14). A national study of 19,499 Iranian adults also found that poorer self-rated health was associated with lower happiness, even after accounting for selected socioeconomic factors (15). Another study conducted across several provinces of Iran showed that both physical activity and happiness were associated with perceived quality of life (16). Collectively, these findings suggest that health, movement behavior, and happiness are interconnected within a multifactorial network, but happiness cannot be regarded solely as an outcome of physical activity.

Despite this evidence, most studies have examined pairwise links between health and happiness, motivation and physical activity, or physical activity and well-being separately. Less evidence is available on these variables within a single structural model among women in the general Iranian population. Therefore, the present study tested a prespecified sequential model in which greater general-health problems were expected to be associated with lower sport participation motives, stronger motives with higher physical activity, and higher physical activity with greater happiness. In addition to the three direct associations, indirect associations within the same chain were examined. Given the cross-sectional nature of the data and the restricted set of specified paths, the purpose was to test an associational structure rather than to establish causality or classical full/partial mediation.

Materials and Methods

Study Design and Population: The present study was cross-sectional and descriptive-correlational. The target population comprised women aged 15–65 years residing in the 15 municipal districts of Isfahan, Iran. The initial sample size was set at 384 based on the Krejcie and Morgan table (17). To allow for potentially incomplete questionnaires, the target

number for data collection was increased to 420; ultimately, 395 complete questionnaires were included in the statistical analyses.

Sampling and Data Collection: Multistage cluster sampling was used. First, 6 of the 15 municipal districts of Isfahan were randomly selected, followed by the random selection of 4 neighborhoods from each selected district. Within the selected neighborhoods, research assistants randomly approached households and identified women aged 15–65 years who met the eligibility criteria. In households with more than one eligible woman, the woman willing to participate completed the questionnaire, and no more than one questionnaire was collected per household. Before completion, participants were informed about the general purpose of the study, the voluntary nature of participation, the anonymity of the questionnaire, and the confidentiality of the information provided. Questionnaires with incomplete main sections were excluded from the analysis. Thus, districts, neighborhoods, and households were selected randomly, whereas final selection of the individual within a household was not fully random because it depended on willingness to participate; this was considered when interpreting the generalizability of the findings.

Sport Participation Motives Measure: Sport participation motives were assessed using the 30-item Participation Motivation Questionnaire (PMQ) developed by Gill, Gross, and Huddleston (4). The version used in this study comprised eight domains: achievement/status, teamwork, fitness, energy release, situational factors, skill development, friendship, and fun, with responses recorded on a three-point scale. The PMQ was originally developed to assess motives for sport participation in youth populations (4). In the broader literature on motivation for physical activity, other instruments have been developed for broader age groups and adults, including the Physical Activity and Leisure Motivation Scale (PALMS), an independent measure of motivation for participation in physical activity and sport (5). Evidence for the validity of the Persian PMQ has been reported in Iranian school samples (18). In the initial evaluation of the present data, Cronbach's alpha for the PMQ items was approximately 0.83. For the PLS-SEM measurement model, scores for the eight PMQ domains were entered as indicators of the sport participation motives construct.

General Health Measure: General health was assessed using the 28-item General Health Questionnaire (GHQ-28) developed by Goldberg and Hillier (9). The instrument includes four domains: somatic symptoms, anxiety/sleep disturbance, social

dysfunction, and depressive symptoms. The validity and reliability of the Persian GHQ-28 have been confirmed in Iran (10). In the present dataset, responses were scored according to the version used in the original project, with higher scores indicating greater general health problems. Accordingly, the negative coefficient for general health in the model indicates that greater health problems were associated with a lower level of the subsequent construct. Cronbach's alpha for all 28 GHQ-28 items in the study sample was 0.81, indicating satisfactory internal consistency. In the PLS-SEM measurement model, the 28 individual items were not entered separately; instead, the four GHQ-28 domain scores were used as indicators of the general health construct. At this level of analysis, Cronbach's alpha for the general health construct was 0.719 and composite reliability was 0.833. The difference between alpha values of 0.81 and 0.719 reflects the different levels at which reliability was calculated: the former was based on all 28 questionnaire items, whereas the latter was based on the four domain-level indicators used in the measurement model.

Happiness Measure: A modified 29-item measure based on the Oxford Happiness Questionnaire was used to assess the positive psychological outcome. The instrument developed by Hills and Argyle was designed to assess happiness/psychological well-being (19). Persian and modified 29-item versions with four-point response formats have also been used in Iranian studies and have demonstrated satisfactory reliability; for example, a 2023 study of Iranian adults reported a Cronbach's alpha of 0.96 for a modified 29-item version (14). In the original project documents, this variable was labeled "social vitality"; however, to align the construct name more closely with the instrument's nature, the term "happiness" is used in the present article. In the initial study evaluation, Cronbach's alpha for this instrument was approximately 0.93. Consistent with the implementation and archived analytical structure of the present study, aggregated scores for seven content domains—life satisfaction, self-efficacy, empathy/sociability, positive outlook, well-being, cheerfulness, and self-esteem—were entered as indicators of the happiness construct in the measurement model. This domain grouping reflects the operationalization and analytical approach used in the present study. It should not be interpreted as confirmation of an independent seven-factor structure for the standard OHQ.

Physical Activity Assessment: Physical activity was measured using two self-reported indicators: the number of exercise sessions per week and the duration

of each exercise session. These two indicators were entered into the analysis as indicators of the physical activity construct. Because activity intensity, activity type, MET-min/week, and sedentary behavior were not measured, the present construct should be interpreted as a limited indicator of the extent of participation in physical activity rather than as a comprehensive measure of physical activity.

Study Approval and Participant Rights: Participation was voluntary, and before completing the questionnaire, participants were informed about the study's general purpose, the optional nature of participation, and the confidentiality of their information. Questionnaires were completed anonymously.

Statistical Analysis: Descriptive statistics were calculated using SPSS version 23, and partial least squares structural equation modeling (PLS-SEM) was performed using SmartPLS version 3. PLS-SEM was selected because the analysis focused on explained variance in endogenous constructs, the predictive orientation of the prespecified model, and the multidimensional structure of some constructs. This choice does not imply the absolute superiority of PLS-SEM over covariance-based approaches; rather, it was consistent with the purpose and analytical framework of the original study. In the measurement model, construct reliability was assessed using Cronbach's alpha and composite reliability, and convergent validity was assessed using average variance extracted (AVE). Values of at least 0.70 for reliability and 0.50 for AVE were used as reference thresholds (20). In the initial analysis, outer loadings above 0.40 were reported, and indicators were retained because composite reliability and AVE were satisfactory. Discriminant validity was assessed using the Fornell–Larcker criterion (21) and the heterotrait–monotrait ratio (HTMT). For the Fornell–Larcker criterion, the square root of each construct's AVE was required to exceed its correlations with the other constructs. At the same time, HTMT values below 0.85 were considered evidence of satisfactory discriminant validity (20). For the structural model, R^2 values for endogenous constructs, f^2 effect sizes, and path coefficients were evaluated. Statistical significance of direct and indirect coefficients was assessed using nonparametric bootstrapping and a two-sided criterion of $|t| > 1.96$ at $\alpha = 0.05$. Because of the model's sequential structure, each endogenous construct had only one direct predictor, and internal collinearity was not problematic for the specified paths. Given the cross-sectional design, terms such as "effect" in the tables refer only to structural coefficients estimated within the model and do not imply causal relationships.

Results

A total of 395 women were included in the analysis. Of these, 67.5% were married, 30.0% were single, 2.0% were widowed, and 0.5% were divorced. Regarding age, 29.2% were 15–34 years old, 63.8% were 35–54 years old, and 7.0% were 55–65 years old. In terms of education, 32.8% had less than a high school diploma, 41.0% had a high school diploma or an associate degree, 26.0% had a bachelor's or master's degree, and 0.2% held a doctoral degree. Regarding employment, 68.1% were homemakers, 22.0% were employed, 7.1% were unemployed, 2.0% were retired, and 0.8% were students. Participant characteristics are presented in Table 1.

Table 1. Demographic characteristics of participants (N = 395)

Variable	Category	%
Marital status	Married	67.5
	Single	30.0
	Widowed	2.0
	Divorced	0.5
Age group (years)	15–34	29.2
	35–54	63.8
	55–65	7.0
Education	Less than high-school diploma	32.8
	High-school diploma/associate degree	41.0
	Bachelor's/master's degree	26.0
	Doctoral degree	0.2
Employment status	Unemployed	7.1
	Employed	22.0
	Student	0.8
	Homemaker	68.1
	Retired	2.0

Evaluation of the measurement model showed that composite reliability exceeded 0.83 for all constructs and AVE exceeded 0.50 for all constructs. Cronbach's alpha for the physical activity construct was 0.702, and the values for the other constructs were also above 0.70. The square roots of AVE for general health, sport participation motives, physical activity, and happiness were 0.756, 0.711, 0.875, and 0.834, respectively. According to the Fornell–Larcker criterion, the square root of the AVE for each construct exceeded the absolute value of its correlations with the other constructs; therefore, discriminant validity was supported by this criterion (Table 3). HTMT values ranged from 0.171 to 0.598, and all were below the conservative threshold of 0.85, providing additional evidence of discriminant validity (Table 4). Reliability and convergent-validity indices for the measurement model, along with indices for the endogenous constructs, are presented in Table 2.

Table 2. Measurement-model indices and endogenous-construct statistics

Construct	Cronbach's α	Composite reliability	AVE	$\sqrt{\text{AVE}}$	R ²	f ²
General Health	0.719	0.833	0.571	0.756	—	—
Sport Participation Motives	0.839	0.870	0.505	0.711	0.031	0.032
Physical Activity	0.702	0.867	0.766	0.875	0.225	0.290
Happiness	0.927	0.941	0.696	0.834	0.084	0.092

AVE = average variance extracted; R² = coefficient of determination; f² = effect size.

Cronbach's alpha of 0.719 for the general health construct was calculated from the four GHQ-28 domain indicators in the measurement model; Cronbach's alpha for all 28 GHQ-28 items was 0.81.

Discriminant validity was assessed using the Fornell–Larcker criterion and HTMT. Under the Fornell–Larcker criterion, the square roots of AVE for general health, sport participation motives, physical activity, and happiness were 0.756, 0.711, 0.875, and 0.834, respectively, and in every case exceeded the absolute value of the construct's correlations with the other constructs. Thus, discriminant validity was supported by the Fornell–Larcker criterion (Table 3). In addition, HTMT values ranged from 0.171 to 0.598, all below the conservative threshold of 0.85, providing further evidence of discriminant validity (Table 4).

In the structural model, greater general-health problems were associated with lower sport participation motives ($\beta = -0.177$, $t = 3.87$, $P = 0.001$). This path explained 3.1% of the variance in sport participation motives ($R^2 = 0.031$), and its effect size was small ($f^2 = 0.032$). The strongest association in the model was observed between sport participation motives and physical activity ($\beta = 0.474$, $t = 13.19$, $P = 0.001$); this path explained 22.5% of the variance in physical activity ($R^2 = 0.225$), with $f^2 = 0.290$. Physical activity was also positively and significantly associated with happiness ($\beta = 0.290$, $t = 5.85$, $P = 0.001$) and explained 8.4% of the variance in happiness ($R^2 = 0.084$; $f^2 = 0.092$).

All three indirect associations reported within the model chain were statistically significant. The indirect

association between general health and physical activity through sport participation motives was $\beta = -0.084$ ($t = 3.65$, $P = 0.001$). The indirect association between sport participation motives and happiness through physical activity was $\beta = 0.137$ ($t = 4.94$, $P = 0.001$). Finally, the serial indirect association between general health and happiness through sport participation motives and physical activity was $\beta = -0.024$ ($t = 2.71$, $P = 0.007$). Although statistically significant, this coefficient was small in magnitude. Direct and indirect coefficients are presented in Table 5, and a simplified representation of the model is shown in Figure 1.

Discussion

The present study tested a sequential model linking general health, motives for sport participation, physical activity, and happiness among women in Isfahan. All three direct and indirect associations within the specified chain were statistically significant, although their magnitudes differed. The strongest path was from sport participation motives to physical activity, whereas the contribution of general health to motivational differences and that of physical activity to happiness were more limited. Thus, the principal message of the model is not that health or physical activity alone determines happiness, but rather that a constrained and statistically observable behavioral chain exists among these four constructs.

Table 3. Discriminant-validity matrix based on the Fornell–Larcker criterion

Construct	General Health	Sport Participation Motives	Physical Activity	Happiness
General Health	0.756			
Sport Participation Motives	−0.221	0.711		
Physical Activity	−0.183	0.473	0.875	
Happiness	−0.140	0.324	0.290	0.834

Diagonal values are the square roots of average variance extracted (AVE); off-diagonal values are correlations between constructs. Discriminant validity according to the Fornell–Larcker criterion is supported when the square root of each construct's AVE exceeds the absolute value of its correlations with the other constructs.

Table 4. HTMT matrix for assessment of discriminant validity

Construct	General Health	Sport Participation Motives	Physical Activity	Happiness
General Health	—			
Sport Participation Motives	0.254	—		
Physical Activity	0.221	0.598	—	
Happiness	0.171	0.389	0.351	—

All HTMT values were below the conservative threshold of 0.85, supporting discriminant validity of the model constructs.

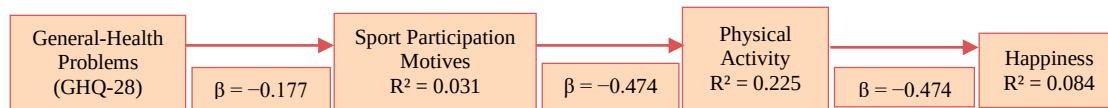


Figure 1. Final structural model of the study

Serial indirect association between general health and happiness through sport participation motives and physical activity:
 $\beta = -0.024$, $t = 2.71$, $P = 0.007$.

The first path showed that a higher GHQ-28 score, indicating greater general-health problems, was associated with lower sport participation motives. The direction of this finding is consistent with studies identifying health symptoms, fatigue, perceived barriers, and individual circumstances as factors that may constrain women's physical activity (3). However, R^2 for sport participation motives was only 0.031, indicating that health status explained only a small proportion of motivational differences. This is theoretically important because motives for sport participation reflect a combination of intrinsic and extrinsic reasons, social opportunities, experiences of competence, enjoyment, belonging, and environmental conditions; therefore, a strong association with a single health indicator would not be realistic. Reviews grounded in Self-Determination Theory likewise indicate that components such as competence and autonomous motivation play more substantial roles in sustaining activity (6, 7).

The strongest finding was the association between motives for sport participation and physical activity. The coefficient of 0.474 and R^2 of 0.225 indicate that, within the present model, the set of reasons for sport participation accounted for more of the variation in active behavior than did the other modeled relationships. This finding is consistent with the sport-motivation literature. The PMQ was originally designed to identify diverse reasons for participation in sport. At the same time, subsequent work in the broader motivation literature has likewise shown that reasons for engaging in physical activity cannot be reduced to a single factor (4, 5). From the perspective of Self-Determination theory, intrinsic motivation, identified regulation, and perceived competence are also associated with more sustained participation in physical activity (6, 7). An intervention study among middle-aged Iranian women showed that changes in activity-related beliefs and self-efficacy may be accompanied by meaningful increases in physical activity (8). From an applied perspective, these findings suggest that programs providing health information alone are unlikely to be sufficient to increase participation; enjoyment, choice, a sense of progress and competence, opportunities for

interaction, and compatibility with everyday life should also be considered in program design.

The positive association between physical activity and happiness was also consistent with a substantial body of evidence. Timm et al. reported that activity episodes in everyday life are often associated with better affective well-being, although heterogeneity in methods and populations limits simple, uniform conclusions across settings (11). Guo et al. likewise found that physical activity was associated with subjective well-being and that social support and self-efficacy may contribute to this relationship (12). In the study by Li et al., more frequent exercise was associated with greater happiness. However, the authors emphasized the directionality of the relationship and heterogeneity of effects across social subgroups (13). In Iran, Seyed Hosseini et al. reported that adults with active leisure lifestyles were happier than their inactive counterparts (14). Thus, the direction of the association observed in the present study is consistent with both international and Iranian evidence.

Nevertheless, R^2 for happiness was only 0.084, and the f^2 value for physical activity in relation to happiness was 0.092. These values argue against presenting physical activity as the principal determinant of happiness. Happiness is a multifactorial construct associated with health, income, employment, social relationships, security, life satisfaction, and individual characteristics. In a national study of 19,499 Iranian adults, Mohammadi et al. found that self-rated health, income, and employment were associated with happiness (15). Gilan et al. likewise reported that happiness, social trust, and physical activity were all related to quality of life and that the strength of these relationships differed by gender (16). Accordingly, the low R^2 for happiness should not be viewed as a statistical error, but rather as evidence of the restricted scope of the model and the multifactorial nature of the outcome.

The serial indirect association between general health and happiness through sport participation motives and physical activity was statistically significant but very small ($\beta = -0.024$) and should therefore be interpreted with caution. Statistically, the specified chain was consistent with the data: greater health problems were associated with lower motives;

lower motives were associated with lower physical activity; and lower physical activity was associated with lower happiness. However, the present study did not estimate every possible path among the four constructs, and the cross-sectional design does not establish temporal precedence. Therefore, terms such as "full mediation" or "causal mechanism" are not used. A more precise conclusion is that a serial indirect association was observed within the specified model.

From the perspective of health promotion and community-based applications, the findings have two implications. First, health-related limitations should be considered when designing activities for women; activities that are not compatible with an individual's functional capacity and circumstances may reduce motivation to participate. Second, the largest contribution in the model was related to sport participation motives; therefore, creating opportunities that are accessible, enjoyable, choice-supportive, and aligned with individual goals may be more effective than relying solely on general health recommendations. This interpretation is consistent with the World Health Organization's emphasis on adapting physical activity to individual abilities and circumstances, and with evidence regarding autonomous motivation (1, 6). For rehabilitation sciences, the relevance of these findings lies particularly in prevention and community-based rehabilitation: maintaining or resuming an active lifestyle depends not only on the absence of symptoms, but also on motivational factors and positive experiences of participation.

Limitations

The present study has several limitations. First, the cross-sectional design precludes establishing temporal precedence or drawing causal inferences. Second, physical activity was measured only by the number of sessions and duration per session; intensity, activity type, METs, and sedentary time were not assessed. Third, the data were self-reported, and common-method measurement may have strengthened some of the observed associations. Fourth, at the final stage of

sampling, a willing participant was selected within each household, creating the possibility of self-selection bias; in addition, the design effect associated with cluster sampling was not incorporated into the sample-size calculation. Fifth, the PMQ was originally developed in youth sport, and specific validation of the instrument in adult Iranian women remains limited. Sixth, the modified Oxford-based instrument assesses individual happiness; therefore, the findings should not be generalized to the broader sociological concept of "social vitality." Seventh, the structural model estimated only the prespecified chain and did not include alternative paths among all constructs or covariates such as age and socioeconomic status. These limitations indicate the need to replicate the study using longitudinal designs, more objective measures of physical activity, and competing structural models.

Recommendations

Future research should use comprehensive, standardized physical activity instruments such as the IPAQ or accelerometer-based assessments, random sampling at the individual level, and longitudinal or panel analyses to examine the temporal ordering of the associations. Variables such as social support, self-efficacy, access to facilities, caregiving responsibilities, age, and socioeconomic status should also be considered as contextual or moderating factors. Specific validation of sport-participation motivation measures in adult Iranian women and comparison with motivation instruments designed for adults may strengthen the construct validity of future findings. Intervention studies could also test whether combined programs that adapt activity to health status while strengthening intrinsic motives and experiences of success are more effective than physical-activity advice alone.

Conclusion

In this sample of 395 women from Isfahan, greater general health problems were associated with lower motives for sport participation; stronger motives were associated with higher physical activity; and higher physical activity was associated with greater happiness.

Table 5. Direct and indirect path coefficients in the structural model

Relationship type	Path	β	t	P
Direct	General Health $\rightarrow$ Sport Participation Motives	-0.177	3.87	0.001
Direct	Sport Participation Motives $\rightarrow$ Physical Activity	0.474	13.19	0.001
Direct	Physical Activity $\rightarrow$ Happiness	0.290	5.85	0.001
Indirect	General Health $\rightarrow$ Physical Activity via Sport Participation Motives	-0.084	3.65	0.001
Indirect	Sport Participation Motives $\rightarrow$ Happiness via Physical Activity	0.137	4.94	0.001
Serial indirect	General Health $\rightarrow$ Happiness via Sport Participation Motives and Physical Activity	-0.024	2.71	0.007

β = standardized path coefficient. Coefficients are interpreted as structural associations within the cross-sectional model and do not imply causality.

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Authors' Contribution

Conceptualization and study design: Sahar Faeghi
Development of the methodological framework: Sahar Faeghi
Scientific and executive support and management of the research process: Sahar Faeghi, Setareh Dineli
Data collection and organization: Setareh Dineli, under the supervision of Sahar Faeghi
Literature review and preparation of the scientific content: Sahar Faeghi, Setareh Dineli
Analysis and interpretation of the findings: Sahar Faeghi
Preparation and writing of the original manuscript draft: Sahar Faeghi
Scientific review and editing of the manuscript: Sahar

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Approval of the final version for submission to the journal: Sahar Faeghi, Setareh Dineli

Responsibility for maintaining the scientific integrity of the study and accountability for the content of the manuscript: Sahar Faeghi, Setareh Dineli

Both authors have read and approved the final version of the manuscript and accept responsibility for its scientific content

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Conflict of Interest

The authors did not have a conflict of interest.

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