

Examining social-cognitive predictors of parenting skills among mothers with preschool and early elementary school-aged children

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ABSTRACT

Context: Identification of parenting skills determinants among mothers is an ongoing field of research. **Aims:** The aim of this study was to identify the social cognitive predictors of parenting skills among mothers. **Settings and Design:** Previous studies have demonstrated the health action process approach (HAPA) as a credible frame for predicting behavior, but the number of studies considering the predictive value of parenting skills determinants among mothers is rare. **Subjects and Methods:** An 8 months prospective design was applied. Participants were mothers with preschool and early elementary school-aged children. At the 1st time, 120 participants completed self-report questionnaires regarding their risk perception, outcome expectancies, task self-efficacy, and intentions toward parenting skills. At the 2nd time, they returned a follow-up questionnaire, which measured planning, coping self-efficacy, and recovery self-efficacy and finally, 8 months later as the 3rd time, parenting skills were measured. Path analysis was used for analysis. **Results:** Path analysis indicated that, in the motivational phase, there was no relationship between parenting skills intention and risk perception, outcome expectancies, and task self-efficacy. Furthermore, no relationship was found between parenting skills intention and planning. In the volitional phase, coping self-efficacy, recovery self-efficacy, and planning were statistically significant predictors of parenting skills. **Conclusion:** The results of this study confirm that volitional phase of the HAPA model is useful in determining parenting skills. However, the role motivational variables seem to be unimportant in performing these behaviors. It was concluded that everybody intended to apply parenting skills, in nature, and intervention strategies should be focused on turning intentions into behavior.

Key words: Health action process approach, parenting skills, self-efficacy, social cognitive predictors

INTRODUCTION

Parenting is one of the most relevant perspectives while studying the relationships between parents and children.^[1]

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Barlow defined parenting programs as “focused short-term interventions, which are typically aimed at helping parents to deal with their children’s emotional and behavioral development.”^[2] As today’s parents are more time pressured and have fewer supporting caregivers in proportion to the parents of previous generations, planning and conducting such programs seems to be necessary. In recent years, there has been an increase in the demands for parent education programs. Along with this increase, the number of studies investigating the efficacy of different parenting interventional programs raised.^[3] The general aim of these programs is to assist parents in developing self-awareness and self-confidence and improving their capacity in supporting and nurturing their children, as well.^[4] As Dehart stated: “Mothers who have problematic interactions with their children become overstressed, and their anxious state leads to weak parent-child interaction.”^[5] Furthermore, Pourabdoli found that there was a statistically significant relationship between a child’s perceptions on his/her mother’s parenting style, the child’s locus of control and his/herself-esteem.^[6] Several studies have concluded that there are effective, empirically-approved parent education programs, but that they are not being implemented rapidly enough to satisfy the demand. These positive findings are encouraging and show that parent education programs may help them and their children in improving their relationships, academic performance, and social skills. However, there is a need for more investigation on parents’ needs.^[3]

The health action process approach (HAPA) distinguishes between a preintentional motivation phase and a subsequent postintentional volition phase.^[7] According to HAPA, in the preintentional motivation phase, the risk perception (vulnerability and severity), outcome expectancies, and task self-efficacy are seen as the background for forming an intention.^[8] Risk perception connote to the individuals’ beliefs about the likelihood that a health problem will be experienced. Higher perceived the risk of suffering illness motivates people to adopt their health protections with preventive behaviors. Outcome expectancies result from a balance between the pros and cons of behavioral outcomes, in a way that positive outcome expectancies of behavior may lead to intention for accept behavior. Task self-efficacy, defined as the belief in one’s ability to do a desired action, is seen as the most powerful predictor for behavioral intention.^[9] A person who does not believe in his/her own capability to fulfill a desired action might fail to accept it. When a person develops an inclination toward healthy behavior, intention has to be translated into action.^[10,11] The HAPA model, firstly, indicates that coping self-efficacy is a decretive construct in the postintentional volition phase. It implies to optimistic beliefs about one’s capability to counter barriers that arise during the postintentional phase and to maintain the behavior.^[10]

In addition, according to the model, planning is hypothesized to be brokered by the intention-behavior relationship.^[12]

This construct can be categorized into two facets: Action planning and coping planning. Action planning is defined as a volitional process that links goal-directed responses to positional cues by specifying when, where, and how to act in accordance with one’s goal intention.^[13] Coping planning connotes to anticipating difficulties or barriers that might hamper the performance of one’s behavioral.

Intention and includes detailed planning on how to overcome such difficulties.^[11,14] The HAPA is considered as a useful accretion of the essential concepts of current social cognitive health behavior models and as a theoretical framework for recognizing post intentional factors leading to behavior adoption.^[15] The HAPA has been used in research on a wide variety of health behaviors. One study compared the ability of three behavior change theories (the health belief model, the theory of planned behavior and the motivational phase of the HAPA) to predict intention on dieting behaviors and perform breast self-examination.^[16] The HAPA model has also been found to fit data from a South Korean sample, within which maintenance self-efficacy was the best direct predictor of a low-fat/high-vitamin diet.^[17] Also, other studies found the HAPA as a useful model at predicting seat-belt use,^[18] and good nutrition,^[19] as well.

Several studies have illustrated that the HAPA is prosperous in predicting physical activity in the rehabilitation of orthopedic^[11,20] and cardiac patients.^[13,21] Moreover, in a study conducted on South Korean adults, it was found that the HAPA model was a good predictor of physical activity among a nonrehabilitation population.^[22]

Based on the search done by the authors of the present study, no research have examined the utility of the HAPA in predicting Social cognitive variables of parenting skills among mothers with preschool and early elementary school-aged children. Identification of a meaningful set of behavioral determinants in this population is critical for developing the future theory-based interventions. In this study, the relationships between parenting skills predictors were investigated applying HAPA among mothers with preschool and early elementary school-aged children through a longitudinal design in path analysis. Given the previous research on HAPA, it was hypothesized that the data would, well, fit the model. More specifically, it was hypothesized that the following direct relationships will be supported in the model: (a) Risk perceptions, outcome expectancies and task self-efficacy predict intention, (b) intention and coping self-efficacy predict planning, (c) planning and recovery self-efficacy predict behavior. If the direct relationships were supported, it will also hypothesize that the model support the following indirect relationships: (a) Action self-efficacy, outcome expectancies and risk perception are related to planning through intention, (b) intention is related to behavior through planning, and (c) coping self-efficacy is related to behavior through planning.

SUBJECTS AND METHODS

HAPA is a social cognitive and psychological model in the health education area which used as the theoretical structure in this research.^[9,10] This model includes three stages: (1) Actor, (2) intender and (3) preintender. In the preintender stage, the individual has no intention for performing the behavior. In the intender stage, the individual has an intention for performing behavior but it does not lead to any action and in actor stage, the individual performs the behavior.

This study conducted in 2013 using a longitudinal design in path analysis. The study received ethics approval from the Research Ethics Board at Yazd Shahid Sadoughi University of Medical Sciences, Iran. Multistage cluster randomized sampling was used to collect data. It was a field trial, conducted on 120 mothers with preschool and elementary children. The power of the study was 0.80 and $\alpha = 0.05$, *a priori*. In the first step, six schools were randomly selected in Abhar City, Zanjan Province, from which four schools were in the intervention group, and two were in the control group. It was emphasized that their participation is arbitrary, and the confidentiality of data was assured. The inclusion criteria were mothers with preschool and early elementary school-aged children, have, at least, diploma literacy and had completed a written consent form.

In the second step, after coordination with the schools managers, 30 students were randomly chosen from preschool, first, second, and third grades of every school. On behalf of the school managers, the mothers were invited to participate in a workshop. The objective of this workshop was to recognize the qualified mothers. From 180 invited mother, 120 were qualified the entrance criteria.

Then a questionnaire designed based on HAPA (pretest) model was distributed among the participants. Objective structured clinical evaluation (OSCE) test was held at the same time. The results showed that none of the mothers passed the test in all three stages of HAPA test (preintender, intender, and actor). Therefore, the educational intervention for all of the mothers in all three phases of HAPA test (motivational, volitional, and action) was performed.

In the next step, all of the mothers in intervention group were invited to participate in an educational workshop lasting ten sessions. The educational content of five sessions were attending skills, rewarding, effectively give directions, ignoring and time-out in motivational phase. The next five sessions were focused on attending skills, rewarding, effectively give directions, ignoring and time-out in volitional phase. Each session lasted 2 h.

The number of people in each session was 20. In the sessions some educational methods like group discussion, problem-based learning, and role playing were used. The sessions were directed by a psychologist and a health education expert. At the end of the motivational phase sessions, the

questionnaire which was designed based on HAPA, including motivational structure was collected by the mothers of the intervention group.

The results showed that all of the mothers in intervention group passed the test of motivational phase. Hence, they were invited for the volitional phase workshop, which was held in five sessions. Every session lasted for 2 h, and the educational content included the skills of parenting as follows:

- The necessity of parenting skills
- The complications of wrong parenting
- The risk of wrong parenting
- Benefits of and expectations from using parenting skills
- Attending skill, ignoring skill, effectively give directions skill, rewarding skill, time-out skill
- Time, place and the manner of correct parenting skills
- Barriers of implementing parenting skills
- The ability of planning for implementation of parenting skills.

The manner of implementation of parenting skills after 1-month, all of the mothers invited to the school in order to answer the questionnaire designed based on volitional phase structure. Six months later, once again they were invited to participate in the final OSCE test. In order to eliminate the Hawthorne effect, while establishing the classes for the intervention group, the other classes were educated with the educational subjects delivered to nonintervention group.

In order to data collection, the following instruments were used

The questionnaire designed based on HAPA model measured 9 HAPA model structures in 9 different scales. Each scale includes a base and a number of questions. The participants were asked to answer the questions which were designed in 5-point Likert-type scaling. The possible range for scales was as follows:

- Susceptibility scale: 6–30 points
- Severity scale: 6–30 points
- Outcome expectancy scale: 6–30 points
- Action self-efficacy scale: 7–35 points
- Intention scale: 5–25 points
- Coping self-efficacy scale: 7–35 points
- Recovery self-efficacy scale: 3–15 points
- Action planning scale: 3–15 points
- Coping planning scale: 5–25 points.

Objective structured clinical evaluation test

This test was used to measure the behavior structure of participants. The steps of implementing his test were as follows:

Preparation stage: In this stage, nine graduate students in psychology were trained on parenting skills to act as appraisers. In the second step, nine children between 6 and 8-year-old were invited and trained to participate in the test. In the third step, checklists and scenarios for each station were prepared. Finally, the steps of the test were reviewed by appraisers and children in a trial session.

After preparation of the appraisers and children, the program was coordinated with the school manager. Nine classrooms were assigned to the test stations; the first station for attending skill, the second and sixth for rewarding, the third and seventh for give directions skill, the fourth and eighth for ignoring and the fifth and ninth for time-out skill. Each station consisted from four elements: (1) An appraisers, (2) a child, (3) station scenario and (4) the corresponding checklist.

Station scenarios

every station in this test needed a scenario. In these scenarios, mothers were involved in a simulated situation to perform one of the parenting skills. An example of attention skill was as follows: Suppose your child is in the room. In the past week, you have heard the following sentence for many times from him/her: "You do not pay attention to me." That is why you decided to show that his/her opinion is not correct, and you have paid enough attention to him/her. She/he is now painting, please perform the attention skill on him/her.

The OSCE checklists are as follows: The checklists, as well as the number of their related questions for every skills, were as follows: Rewarding skill with five questions, ignoring with five questions, time-out, with seven questions, attending skill with five questions and effectively give directions with seven questions. The appraisers should select Yes or No for each answer. YES for correct and NO for the incorrect performance of the skill. At the end of each checklist, there was a question with Likert-type scale (1 = very bad to 5 = excellent), which evaluated the performance of the individuals.

The implementation stage

All the mothers were invited to the school to take the OSCE test. At first, they were described the steps of taking the test, and they were asked to enter each station one after another. In each station, the corresponding appraiser described the scenario to the mother and asked her to perform the corresponding skill to the child. Each appraiser evaluated the mother's skill based on the checklist.

The abrasion rate between times 1, 2 and 3 was equal to 10%, which is lower than those found in the previous studies. The HAPA-based questionnaire (except for behavior scale) was designed according to the instructions noted by Prof. Schwarzer, therefore, in order to determine its validity, we chose to examine content validity, merely. Therefore, health education and health promotion specialists were referred to determine the validity of the questionnaire and checklists. Furthermore, the validity of OSCE test was obtained using exploratory factor analysis. The results are shown in the next section. The scales, number of items and reliability coefficients of the constructs are listed in Table 1.

Risk perception

Risk perception, which was assessed at time 1, is a 12-item scale measuring the individuals' perceived likely consequences of inappropriate child rearing. A 5-point Likert-type scaling, 1 = not likely to 5 = extremely likely, was used. An example

Table 1: Reliability statistics

Scale	Cronbach's alpha	Number of items
Vulnerability	838	6
Severity	929	6
Outcome expectancy	943	6
Task self-efficacy	950	7
Intention	773	5
Coping self-efficacy	939	7
Recovery self-efficacy	781	3
Action planning	878	3
Coping planning	903	5
Behavior	919	9

of items is: How likely is it for you to not use your parenting skills in raising children, reduces the learning desirable behavior in the children? The theoretical range for this instrument was 12–60. Risk perception is composed of severity and vulnerability.

Outcome expectancies

Outcome expectancies, which were assessed at time 1, is a 6-item scale asking participants about inappropriate child-rearing outcomes. Responses ranged from 1 (strongly disagree) to 5 (strongly agree). An example of items is: If I use "ignoring" skill, I will reduce the mistake behavior of the child.

Task self-efficacy

Task self-efficacy, which was assessed at time 1, is a 7-item scale measuring individuals' confidence, capability and ability to apply parenting skills. Responses were on a scale from 1 (not true, at all) to 5 (exactly true). An example of items is: I am sure that I can use the parenting skills even if it will be difficult.

Intention

Intention, which was assessed at time 1, is a 5-item scale asking participants how much they intended and planned to try to use parenting skills. Responses ranged from 1 (not intended, at all) to 5 (strongly intended). An example of items is I intend to learn the desired behavior to my child, using the parenting skills.

Coping self-efficacy

Coping self-efficacy, which was assessed at time 2, is a 7-item scale regarding barriers to use parenting skills. Responses ranged from 1 (not confident) to 5 (completely confident). An example of items is I am certain that I can continually use parenting skills even if I feel disappointment.

Recovery self-efficacy

Recovery self-efficacy, which was assessed at time 2, is a 3-item scale referring to one's confidence on being capable in resuming a difficult behavior after an interruption. The focus is on lapses and to regain confidence after a relapse. Responses ranged from 1 (not true, at all) to 5 (exactly true). An example of items is I am certain that I can resume the parenting skills again, even after leaving it for 3 months.

Planning

Planning, which was assessed at time 2, is an 8-item scale asking participants if they had made a detailed plan about when, where and how they would use parenting skills. Responses ranged from 1 (not true, at all) to 5 (exactly true). Action planning was measured by three items. An example of the items is "I have made a detailed plan on: (a) When or (b) where to do parenting skills." Coping planning was measured by five items. Coping planning pertains to the anticipation of barriers which might arise in the process of adoption and maintenance of behavior, and the degree to which an individual develops appropriate strategies to cope with such barriers. An example of the items is "I have made a detailed plan on:" (a) What to do in difficult situations in order to stick to my good intentions (b) how to deal with a relapse into harsh behaviors.

Behavior

Parenting skills was assessed using OSCE at time 3. In this test, candidates rotated through 9 series of stations within which they were asked to carry out a task. Each station took at least 15 min. In all stations, they were observed by an examiner and scored based on their performance. All candidates rotated through all the stations and thus were tested on the same material. All were judged by checklists. In each station they were examined on the following skills: Attention (in the first station), rewarding (in the second and sixth stations), effectively give directions (in the third and seventh stations), ignoring (in the fourth and eighth stations), and time-out (in the fifth and ninth stations). These skills were performed on the children who were, previously, trained. Rewarding and ignoring skills checklists included 10 items, separately. Furthermore, effectively give directions and time-out checklists included 14 items, separately and attending checklist included 5 items. There were two options (yes/no) for each question. If participants performed the skill properly, in each station, the appraiser would check yes option and vice-versa. The scores were summed up to achieve the total score in each station. Finally, the respondent mothers obtained nine separate scores from nine stations. Validity of OSCE test was examined using exploratory factor analysis. Principal component extraction was used with varimax rotation. Factors with eigenvalues >1 were retained. Table 2 presents the results of the factor analysis of the OSCE test. Two factors emerged that explained 70.59% of the variance.

Table 2: Results of exploratory factor analysis

Stations	Factors	
	1	2
Time-out, 2	0.944	
Ignoring, 2	0.943	
Time-out, 1	0.907	
Ignoring, 1	0.888	
Rewarding, 1		0.802
Effectively give directions, 1		0.700
Effectively give directions, 2		0.698
Attending, 1		0.698
Rewarding, 2		0.665

Therefore, it was decided to name factor 1 as negative, and factor 2 as positive situation for parenting skills.

RESULTS

Path analysis was conducted with AMOS IBM 21 [AMOS Development Corporation, Crawfordville, USA] using the maximum-likelihood estimation to examine associations between social cognitive variables and parenting skills. Risk perception, task self-efficacy, and outcome expectancies at time 1 were specified as predictors of time 1 parenting skills intention, representing the motivational phase of the HAPA. The parenting skills intention at time 1 and also, planning, coping self-efficacy and recovery self-efficacy at time 2 were specified as predictors of time 2 parenting skills behavior, representing the volitional phase of the model. In addition, paths from time 1 task self-efficacy to time 2 coping self-efficacy as well as from coping self-efficacy to time 2 planning were specified. Finally, in order to test the mediating role of planning between parenting skills intention and parenting skills behavior, paths from parenting skills intention to planning, and from planning to parenting skills behavior were specified. To evaluate overall model fit, several indices were used: The Chi-square goodness of fit statistic, the Tucker–Lewis index (TLI), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA). According to Hu and Bentler (1999), CFI and TLI values above 0.95 and RMSEA values <0.06 represent a good model fit.

The means, standard deviations and correlation matrices of the variables are presented in Table 3. As a whole, Pearson correlations revealed that risk perception ($r = -0.675, P < 0.111$), outcome expectancies ($r = -0.672, P < 0.238$), and task self-efficacy ($r = -0.666, P < 0.394$) were not related to parenting skills intention. Task self-efficacy was positively related to coping self-efficacy ($r = 0.919, P < 0.000$). Task self-efficacy was positively associated with outcome expectancies ($r = 0.930, P < 0.000$). Outcome expectancies was positively associated with risk perception ($r = 0.920, P < 0.000$). Coping self-efficacy was positively associated with recovery self-efficacy ($r = 0.826, P < 0.000$). Parenting skills intention ($r = -0.661, P < 0.211$) was not related to planning but coping self-efficacy ($r = 0.869, P < 0.004$) was positively related to planning. Planning ($r = 0.827, P < 0.002$), recovery self-efficacy ($r = 0.813, P < 0.000$) and coping self-efficacy ($r = 0.862, P < 0.000$) were positively related to parenting skills behavior.

The specified model yielded a satisfactory fit across indices, $P = 0.70$, TLI = 1.00; CFI = 1.00; RMSEA = 0.067. In the motivational phase, risk perception ($\beta = -0.30, P < 0.111$), outcome expectancies ($\beta = -0.24, P < 0.238$) and task self-efficacy ($\beta = -0.17, P < 0.394$) were not related to parenting skills intention. In addition, task self-efficacy was significantly related to coping self-efficacy ($\beta = 0.92, P < 0.001$) and accounted for 84% of the variance of coping self-efficacy, confirming the discriminate validity of these two constructs. In the volition phase, planning ($\beta = 0.27,$

$P < 0.001$), coping self-efficacy ($\beta = 0.39, P < 0.001$) and recovery self-efficacy ($\beta = 0.29, P < 0.001$) were positively related to parenting skills behavior and the explained variance was equal to 79%. However, coping self-efficacy ($\beta = 0.41, P < 0.004$) was significantly related to planning and accounted for 59% of the variance but parenting skills intention was not related to planning ($\beta = -0.06, P < 0.211$), [Figure 1].

DISCUSSION

Investigation on the factors related to parenting skills among mothers with preschool and early elementary school-aged children is an important field in family health research. Drawing upon HAPA model, the aim of this study was to obtain information on social cognitive predictors of parenting skills among mothers with preschool and early elementary school-aged children.^[23]

The results of this study showed that HAPA, as conceptual framework, is a useful model which can help in predicting parenting skills, although it was not useful for predicting intention toward parenting skills. As a result, the findings

from the current study extend the evidence for usefulness of volitional phase of HAPA in predicting parenting skills. In this study, the nature of parenting skills is in such a way that everybody intends to apply these skills and intervention strategies should be focused on turning intentions into behavior. Some of hypothesized relationships were found to be significant.

The present study focused, firstly, on preintentional motivation phase leading to intention in performing parenting skills. It was hypothesized that, among mothers, outcome expectancies, followed by task self-efficacy, and risk perception, are positive predictors of parenting skills intention. The results did not confirm the hypothesis and revealed that the contribution of risk perception, task self-efficacy, and outcome expectancies were not significant. However in another study conducted by Barg, both task self-efficacy and outcome expectancies were found to be significant predictors of women intention toward performing physical activities, explaining 57% of the variance within which task self-efficacy was the strongest predictor.^[24] Our results are inconsistent with research Luszczynska and Schwarzer that used HAPA model within which outcome expectancies and self-efficacy, but not risk perception, predicted intention of

Table 3: Means, SD, and correlations matrix (n=120)

Variables	Mean	SD	2	3	4	5	6	7	8
Risk perception	47.80	12.07	0.92**	0.91**	-0.67**	0.91**	0.82**	0.87**	0.88**
Outcome expectancy	22.77	8.11	-	0.93**	-0.67**	0.92**	0.83**	0.88**	0.84**
Task self-efficacy	26.73	9.11	-	-	-0.66**	0.91**	0.83**	0.91**	0.84**
Behavioral intention	9.78	4.21	-	-	-	-0.65**	-0.58**	-0.66**	-0.61**
Coping self-efficacy	26.76	8.75	-	-	-	-	0.82**	0.86**	0.86**
Recovery self-efficacy	12.14	3.43	-	-	-	-	-	0.75**	0.81**
Planning	32.07	9.39	-	-	-	-	-	-	0.82**
Behavior	36.35	10.64	-	-	-	-	-	-	-

** $P < 0.01$. SD=Standard deviation

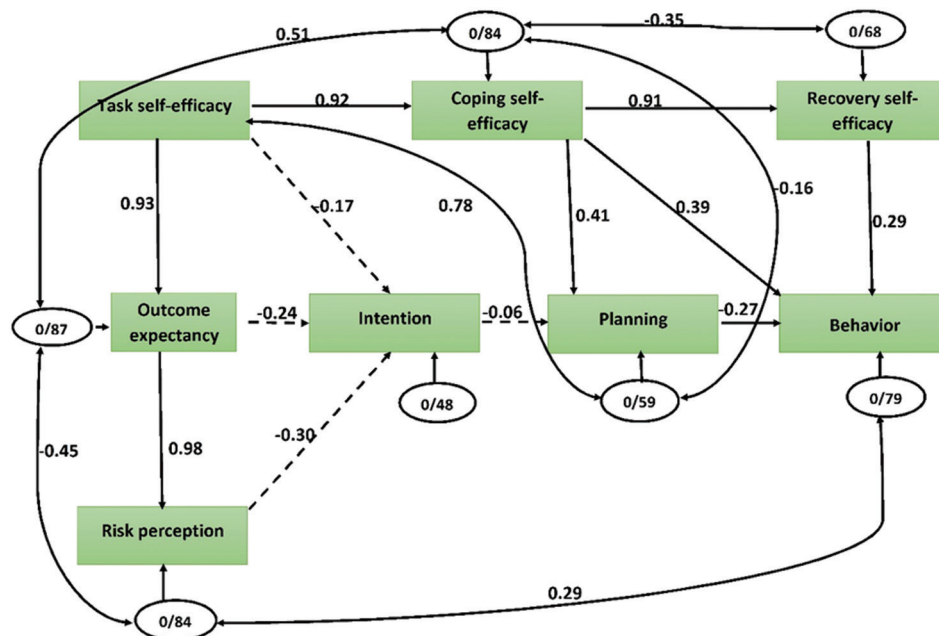


Figure 1: Path analytic model of the relationships between social cognitive variables described in the health action process approach

women toward breast self-examination.^[10] According to the model, risk perception does not predict intention. However, lack of relationship between risk perception and intention has also been found in the other studies that conducted by Schwarzer and Renner.^[10,19,25]

The results showed that risk perception, outcome expectancy, task self-efficacy and intention have no role in promoting parenting skills among the mothers. Mullan *et al.* demonstrated that some aspects of HAPA are useful in predicting breakfast consumption, and they suggested that risk perception and self-efficacy should be targeted in interventions aimed to increase behavior.^[26]

It should be noted that mothers participated in this study, raised their children in the traditional way and there is no guarantee for applying these methods, in the future, on their children. They were, also, unaware of existing scientific methods in child rearing and when they found in this regard, welcomed to learning skills with enthusiasm. Perrier *et al.*, showed that fostering athletic identity through increasing thoughts about oneself as an athlete, along with increasing positive outcome expectancies and reducing negative beliefs will increase individuals' intentions toward participation in sport.^[27]

The second hypothesis is related to postintentional volition phase. It was hypothesized that, among mothers, parenting skills intention is indirectly related to parenting skills, and that planning play a mediating role in this relationship. The results did not confirm this hypothesis and showed that parenting skills intention assessed at baseline did not predict parenting skills 8 months later, with a mediation of planning. This result is in contrast with the research conducted applying HAPA on old patients rehabilitation and old workers within which planning physical activity was necessary to bridge the intention-behavior gap.^[12] Moreover, our results are dissimilar with those found by Renner *et al.*^[22] who found that physical activity intention predicted physical activity behavior positively 6 months later, without any mediation of planning.

In this study, coping self-efficacy was a significant predictor of planning, explaining 59% of the variance. Coping self-efficacy which is the mother's confidence on their ability in dealing with barriers while engaging behavior was the strongest predictor. Coping self-efficacy predicted mother's parenting skills. This finding is in line with prior research that found coping self-efficacy as the best direct predictor of physical activity.^[25]

Based on these results, self-efficacy is important in the prediction of planning and parenting skills behavior. These findings provide particular support for the idea that HAPA shows the phase-specific multiple types of self-efficacy, apparently. Coping self-efficacy was directly related to planning and behavior, as well, and recovery self-efficacy was related to parenting skills behavior. These findings suggest that this construct plays a role in postintentional volition phase processes.

In another study, task self-efficacy was directly related to intentions and indirectly related to planning, and also coping self-efficacy predicted women's physical activity.^[24] Study of Perrier *et al.*, showed that HAPA offers insight into predictors of sport participation and that further research is necessary to understand the relationship between maintenance self-efficacy, planning, and behavior in the context of preplanned behaviors such as sport.^[27]

The model in the current study accounted for 78% of the variance in parenting skills. This value is more than the range of variance (17–32%) found in previous studies using HAPA to predict physical activity behavior.^[13,18,20-22] In the studies that the other social cognitive theories used to predict women's physical activity, the total variance explained was between 9% and 60%.^[25,18-30] According to Perrier *et al.*, building multiple types of self-efficacy through planning may help in maintaining sport participation. Conducting interventions that incorporate these constructs in determining their effectiveness is warranted.^[27] Dissimilar with past research, in this study, the hypothesis that intention affects behavior indirectly through planning was not supported. On the other hand, the hypothesis that coping self-efficacy affects behavior through planning was supported. In contrast, the other studies did not support the hypothesis that coping self-efficacy affects behavior through planning.^[31,32] A probable reason for these inconsistencies is that many previous studies on physical activity applying HAPA have used samples drawn from a clinical population attending scheduled rehabilitation sessions. Attending a session in a predetermined place and time captures the essence of planning. In a sample drawn from a general population, leisure time activity is often unstructured and, therefore, planning does not facilitate it, naturally.^[18] As another reason, it is also possible that the planning scale used in the current study is combined from three aspects of planning (when, where, and how) and it may affect the lower scores for planning.

In this study, both action planning and coping planning were measured. Coping planning refers to imagining potential barriers that may occur and making a plan to overcome them. This type of planning may be, particularly, important for complex behavior like parenting skills for which there are many possible barriers. This behavior is not similar to simple behaviors like seat belt use or dental flossing as well as one-time behaviors like mammography screening. Arbour-Nicitopoulos *et al.*, found that scheduling self-efficacy (similar to coping self-efficacy), partially, mediates the effects of a planning intervention on the physical activity behavior of adults with spinal cord injury.^[33] Another study evaluating a planning intervention on middle-aged women found that planning was related to having higher scheduling self-efficacy.^[28]

In a meta-analysis examining the interventions that changed self-efficacy and physical activity behavior, effectively, planning was identified as a critical intervention component.^[34] Gollwitzer offered an explanation for these findings. Individuals at the point of setting goals and creating

action plans may experience an optimistic bias affecting their perceptions of control. This bias may manifest increased coping self-efficacy.^[35] Mullan *et al.*, showed that the volitional variables do not mediate breakfast consumption indicating that the intention is still the strongest predictor, at least in this behavior.^[26] Additional research is needed to explore the implications of this bias and whether it emerges in other populations.

This study had several strengths. The population was mothers with preschool and early elementary school-aged children and the role of the mother in children's education, especially in the first 8 years of life, is apparent. The longitudinal design of this study was well suited to test the predictive relationships specified in HAPA. Parenting skills was assessed with OSCE at 3 times. It is clear that assessment methods must meet three criteria (valid, reliable, and feasible) to be fair and credible to those being assessed, and OSCE met all these criteria. The high participant retention rates were another strength of the study. The low rate of retention is likely due to a rigorous call back schedule and a run in the period from the larger study. All of HAPA constructs were considered. Although this study had several strengths, there were also some limitations. The model did not include past behavior and therefore, the relationships between HAPA constructs and behavior may be shown with the overestimation. The sample used was predominantly female and Iranian, which may limit the generalizability of findings to the broader population. Given the number of parameters in the model, the sample size is not as large as ideal. Finally, it should be noted that while the model fit the data relatively well, there may be other models that also fit the data.

CONCLUSION

The results of this study showed that HAPA is a useful model in predicting parenting skills, but not useful in predicting intention toward parenting skills. However, motivational variables seem to be unimportant in performing this behavior. Both types of self-efficacy, coping, and recovery self-efficacy, were, particularly, important predictors in the model. Thus, more emphasis on increasing multiple types of self-efficacy may enhance the effectiveness of interventions promoting parenting skills among mothers with preschool and early elementary school-aged children.

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Conflicts of interest

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