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The Role of Mothers' Intentions for Physical Activity Education in Children: A Test of Theory of Planned Behavior

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Abstract

Background: One of the important agents in the development of children physical activity is mothers.

Objective: The present study aimed to assessing the role of socio-cognitive determinants in mothers' intention to physical activity education for children based on the theory of planned behavior.

Methods: This cross-sectional study was conducted among a sample of mothers who have 3 to 6 old child in the west of Iran, 2018. Participants were randomly selected to participate voluntarily in the study. A structured questionnaire was applied for collecting data and data were analyzed by SPSS version 20 using correlations, and linear regression statistical tests.

Results: Mean age of the mothers was 31.68 [95% CI: 31.17, 32.19]. Attitude, subjective norms and perceived behavior control variables predictors accounted for 42% of the variation in the intention of physical activity education for children by mothers. Perceived behavior control (Beta=-0.654 and $P \leq 0.001$) was the more influential predictor on physical activity education intention.

Conclusion: It seems that designing and implementation of educational programs to increase perceived behavior control of mothers regarding the physical activity education for children may be the usefulness of the results in order to the promotion of physical activity among their children.

Key words: *Perceived Behavior Control, Physical Activity, Children*

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Background

Physical activity or exercise is one of the main important factors of a healthy lifestyle (1). Several studies indicated a person who has more exercise will have fewer health-related problems; for example, regular physical activity could reduce deaths related of cardiovascular disease, non-insulin-dependent diabetes mellitus, obesity, high blood pressure and osteoporosis (2). However, studies indicated that 80% of people do not have enough regular physical activity (3). The minimum amount of physical activity recommended for adult by the world health organization is 30 minutes with average intensity and for five days a week (4). High level of physical inactivity among preschool children's is an important problematic issue in several countries (5). Physical activity among children can help to improve their cardio-metabolic profile, bone health, and protect against child obesity (6). Therefore increasing physical activity among children has become important for public health (5). Several studies addressed the association between parental and children's physical activity (7). Parents have to affect their children's physical activity (8). Kathryn and colleagues showed that mother-child physical activity levels were positively associated (9). Mothers take on multiple roles in the education process of their children; for example, parents have been one of the important groups as fundamental partners in the development of educational promotion programs for children physical activity education (10). On the other hand, findings from cross-sectional studies could be help determine potential mediators of physical activity that can be targeted for health planning program and several studies indicated the designing effective intervention need to predict psychological determinants by use of behavioral theory to target, when modified through exposure to the intervention, maybe usefulness results

in increased levels of physical activity (11). Owen and colleagues indicated in a systematic review and meta-analysis research that, overall levels of self-determined

motivation had a weak to moderate, positive associations with physical activity (12). On the other hand, behavioral change theories have largely focused on multipart intrapersonal (e.g., attitude, self-efficacy) and interpersonal (e.g., subjective norms or peer social support) personal processes mediating determinants of physical activity behaviors (13). As well as, comprehensive health planning programs need to emphasize cognitive determinants that mediate and predict health-related behaviors (14-17). In physical activity promotion research, it would be useful to know how psychological determinants, such as attitude, subjective norms or beliefs are responsible to predict intention and consequently behavior (18, 19). The Theory of Planned Behavior (TPB) is designed to predict behavior in numerous contexts (20). In relation to the physical activity based on the theory of planned behavior postulates that cognitive factors such as attitude, subjective norm, and perceived behavior control may predict the intention to begin physical activity. There are published researches to support the predictive validity of the TPB with respect to the physical activity (18, 19).

Current study focused on exploring cognitive factors related to the physical activity education for children by their mothers in a sample of mothers had 3 to 6 years old child who referred to Kermanshah health centers in the west of Iran.

Methods Participants and procedure

This cross sectional study was part of a project conducted among Iranian mothers during 2018, with the goal of providing knowledge for the promotion of physical activity among children.

The sample size was calculated at 95% significant level according to the results of a pilot study and based on the sample size formula $n =$

$\frac{\sigma^2 * z^2_{1-\frac{\alpha}{2}}}{d^2}$ was used, and a sample of 500 was estimated. Based on the standard deviation of the dependent variable obtained from the pilot study which was equal to 1.11 and considering the error rate of onehundredth of a unit, the sample size was estimated to be 492 people; in the present study, 500 people were considered. The study population included all mothers have 3 to 6 years old child who referred to Kermanshah health centers in the west of Iran. To enroll the participants and collect data the following stages were done; First, different areas of the city were classified based on the division of the geographical region, next for each social class one health centers were randomly selected (a total of eight health centers were selected). Then, subjects referred to the health centers for receiving health care, were enrolled into this study voluntarily. Finally, the volunteers were given the self-questionnaire. Of the population of 500, 463 (92.6%) signed the consent form and voluntarily agreed to participate in the study.

Measures

The participants were instructed about how to fill out the designed self-report questioner before gathering the required information. The questionnaire used here included two sections including demographic information questions and theory of planned behavior constructs.

A: Demographic variables

Demographic data inquired included; mother's age (year), child age (year), numbers of child (number), mother's education level (under diploma, high school, and academic), husband education level (primary school, secondary school, high school, and academic), family economic status (weak, average, good), and mother's job (housewife, working).

B: Theory of planned behavior Variables

TPB construct's items were designed based on standard questionnaires applied to physical activity (18, 19). The scale included 11 items under four constructs including (a) attitude; (b) subjective norms; (c) perceived behavioral control; (d) behavioral intention. To measure attitude toward physical activity education for children by mothers' four items were designed. To measure subjective norms toward physical activity education for children by mothers' four items were designed. Two items were designed to the perceived behavioral control toward physical activity education for children by mothers' by mothers. One item was designed to evaluate intention toward physical activity education for children by mothers. For assessment validity of face and content validity scale, 10 faculty members were consulted.
Furthermore, Cronbach's Coefficient Alpha was used to estimate the internal consistency of the various measures. In order to facilitate participants' responses to the items, all items were standardized to a 5point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Estimated reliability using alpha Cronbach coefficient for each theory of planned behavior constructs questionnaire were as follows: attitude (α= 0.66); subjective norms (α= 0.72), and perceived behavior control (α= 0.73).

Statistical Analysis

Data were analyzed by SPSS version 20. Linear regression analysis was performed to explain the variation in the outcome measure of the intention to physical activity education for children by mothers on the basis of attitude, subjective norms, and perceived behavioral control. Pearson correlation was performed to explain the

correlation between the TPB variables. Cronbach's Coefficient Alpha was used to estimate the internal consistency of the various measures.

Results

Mean age of the subjects was 31.68 [95% CI: 31.17, 32.19], ranged from 19 to 49 years. More details of demographic characteristics of the participants are shown in Table 1.

Table 1: Distribution of the demographic characteristics among the 463 mothers

Variables	**Number**	**Percent**
Age group (year) 19-29		
	173	37.4
30-39	249	53.8
40-49	41	8.9
Education level Under		
diploma	143	30.9
High school	199	43
Academic	121	26.1
Husband Education level		
Under diploma	124	26.8
High school	181	39.1
Academic	158	34.1
Occupation Housewife		
	410	88.6
Working	53	11.4
Economic status		
Weak	103	22.2
Average	273	59
Good	87	18.8
Family size 3		
people	209	45.1
4 people	174	37.6
5 people	58	12.5

6 and more people	22	4.8

Table-2 shows the Zero-order correlations. Significance levels at the 0.01 were the criteria for the analysis. The results showed intention was correlated with the attitude (r=0.379), subjective norms (r=0.290), and perceived behavior control (r=0.660). Perceived behavior control was significantly correlated with attitude (r=0.505), and subjective norms (r=0.381). In addition, subjective norms was correlated with the attitude (r=0.329).

Table 2: Correlation between different components of TPB

		X1	**X2**	**X3**
Component	**Mean (SD)**			
X1. Attitude	15.49 (2.56)	1		
X2. Subjective norms	10.88 (3.56)	0.329**	1	
X3. Perceived behavior control	6.97 (1.98)	0.505**	0.381**	1
X4. Intention	3.31 (1.03)	0.379**	0.290**	0.660**

** Correlation is significant at the 0.01 level (2-tailed).

Table-3 indicated the three predictor variables of 1) attitude, 2) subjective norms, and 3) perceived behavioral control accounted for 42% of the variation in the outcome measure of the intention to physical activity education for children by mothers. Perceived behavior control (Beta=-0.654 and P≤ 0.001) was the more influential predictor on physical activity education intention.

Table 3: Predictors of the mother's intention to physical activity education for children

Variables	Unstandardized Coefficients		Standardized Coefficients	t	Pvalue
	B	Std. Error	Beta		
Step 1					
Attitude	0.017	0.017	0.043	1.029	0.304
Subjective norms	0.011	0.011	0.039	0.984	0.326
Perceived behavior control	0.323	0.022	0.620	14.379	<0.001
Step 2					
Attitude	0.20	0.016	0.050	1.217	0.224
Perceived behavior control	0.329	0.022	0.631	15.213	<0.001
Step 3					
Perceived behavior control	0.342	0.019	0.656	18.190	<0.001

Adjusted R squared= 0.42, F: 330.890, and P<0.001

Discussion

The findings of the present study showed that the attitudes towards the behavior, the subjective norm, and the perceived behavior control, as the three main constructs of TPB, were associated with the mother's intention to physical activity education for children. Generally, the findings confirm recommended that the theory of planned behavior is a suitable theoretical basis for the planning health promotion program for physical activity education among children. Another funding of the present study showed cognitive factors accounted for 42% of the variation of the mother's intention on children physical activity education.

The home environment is undoubtedly the very important setting in relation to shaping children's physical activity behaviors and parents as exclusive agents of change, with the addition of some recent findings indicating the usefulness of this approach when designing health promotion programs (21). Several studies recommended using a family-based approach to undergoing children healthy behaviors (2225); for example Mirzaei-Alavijeh et al carried out a family-based study with aim of determine cognitive determinants effective in prevention the onset of substance use in Iranian society's children and indicated that to developing a theory and evidence-based prevention family skills training program it will be useful to increase mothers' self-efficacy, attitude, subjective norms, and behavioral intention to prevention the onset of substance use among children (25). Parents play a substantial role in their child's ability to participate in activities of daily life (21). These studies suggested that to increasing health outcome planning family-based promotion program should be applied for promoting healthy behaviors such as physical activity among children.

Current study findings suggest that the perceived behavioral control toward physical activity education for children is one of TPB variable was a strong predictor to the mother's intention to physical activity education for children. Consistent with previous research (26-29), current study findings showed that there is a connection between the
TPB's behavioral intention and the doing physical activity. Furthermore, a high level of perceived behavioral control, which is related to the theory of reasoned action, was found to be a predictor of the physical activity among children. Furthermore, bivariate correlations showed that the perceived behavioral control toward physical activity education for children was significantly related to intention to mother's intention to physical activity education. In this regards, Jalilian et al noted that confidence to control one's own behavior through high self-efficacy traits could help individuals to do physical activity, which is similar to perceived behavioral control investigated in our study (30). In addition, Armitage in their study reported perceived behavioral control was significantly predictive of intentions and actual physical activity behavior (19). Furthermore, Levy et al in their study among children stated that self-efficacy as an important predictor for doing physical activity (31). In addition, Soltani et al (32) in their study among 301 mothers with children aged 2–6 years old randomly selected from health centers of Tabriz, Iran, reported mothers' self-efficacy and knowledge were the strongest predictors of children oral hygiene behavior. Therefore, it seems that designing interventions for improving mothers perceived behavioral control related to education physical activity for their children can lead to more useful results regarding the promotion of physical activity among children.

Limitations

This study had a few limitations, for example, first, data collection was based on self-reporting, which is usually prone to recall bias. Second, the internal consistency the questionnaire was relatively low (α= 0.66) for assessing attitude.

Conclusion

Current study findings indicated it seems that designing and implementation of educational programs to increase mothers' perceived behavior control regarding the physical activity education for children may be the usefulness of the results in order to the promotion of physical activity among their children.

Declarations

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2. Availability of data and material: Please contact the corresponding author for data requests.
3. Ethical Approval and Consent to participate: The research ethics committee at the deputy of research of the Kermanshah University of Medical Sciences, Kermanshah, Iran (IR.KUMS.REC.1397.492) had approved the study protocol and had monitored the research process. Furthermore, mothers

had been given adequate information about the purpose of the study. Individual personal information was kept confidentially.

4. Consent for publication: Not applicable.
5. Competing interests: The authors declare that there they have no conflicts of interest.

References

1. Wright MS, Wilson DK, Griffin S, Evans A. A qualitative study of parental modeling and social support for physical activity in underserved adolescents. Health Education Research. 2010; 25(2):224-32.
2. Ness AR, Leary SD, Mattocks C, Blair SN, Reilly JJ, Wells J, Ingle S, Tilling K, Smith GD, Riddoch C. Objectively measured physical activity and fat mass in a large cohort of children. PLoS Med. 2007; 4(3):e97.
3. Bin Mohamed Roshdin MA, Murad NA, Rahman NI, Haque M. Knowledge, attitude and practice regarding exercise among people exercising in gymnasium and recreational parks around Kuantan, Malaysia. Journal of Applied Pharmaceutical Science, 2016; 6(06): 4754.
4. Al Hasa FS, Udezue E. Approach on Diabetic Control in Young Saudi Patients. Ann Saudi Med. 2005; 25(2):85-9.
5. Chow BC, McKenzie TL, Louie L. Children's physical activity and associated variables during preschool physical education. Advances in Physical Education. 2015; 5(1):39-48
6. Janssen I, LeBlanc AG. Systematic review of the health benefits of physical activity and fitness in school-aged children and youth. International journal of behavioral nutrition and physical activity. 2010; 7(1):1-6
7. Brown HE, Atkin AJ, Panter J, Wong G, Chinapaw MJ, Sluijs EM. Family ‐based interventions to increase physical activity in children: a systematic review, meta ‐analysis and realist synthesis. Obesity Reviews. 2017; 18(4):491-4.

8. Erkelenz N, Kobel S, Kettner S, Drenowatz C, Steinacker JM, Group TR. Parental activity as influence on childrens BMI percentiles and physical activity. Journal of sports science & medicine. 2014; 13(3):645-650.
9. Hesketh KR, Goodfellow L, Ekelund U, McMinn AM, Godfrey KM, Inskip HM, Cooper C, Harvey NC, van Sluijs EM. Activity levels in mothers and their preschool children. Pediatrics. 2014; 133(4):e973-80.
10. An J, Goodwin DL. Physical education for students with spina bifida: Mothers' perspectives. Adapted Physical Activity Quarterly. 2007; 24(1):38-58
11. Beets MW, Okely A, Weaver RG, Webster C, Lubans D, Brusseau T, Carson R, Cliff DP. The theory of expanded, extended, and enhanced opportunities for youth physical activity promotion. International journal of behavioral nutrition and physical activity. 2016; 13(1):1-5
12. Owen KB, Smith J, Lubans DR, Ng JY, Lonsdale C. Self-determined motivation and physical activity in children and adolescents: A systematic review and meta-analysis. Preventive medicine. 2014; 67:270-279.
13. Craggs C, Corder K, van Sluijs EM, Griffin SJ. Determinants of change in physical activity in children and adolescents: a systematic review. Am J Prev Med. 2011; 40:645–58.
14. Mirzaei-Alavijeh M, Ghorbani P, Jalilian F. Socio-cognitive determinants of the mammography screening uptake among Iranian women. Asian Pacific journal of cancer prevention: 2018; 19(5):1351-5.
15. Kok G, Gottlieb NH, Peters GJ, Mullen PD, Parcel GS, Ruiter RA, Fernández ME, Markham C, Bartholomew LK. A taxonomy of behaviour change methods: an Intervention Mapping approach. Health psychology review. 2016; 10(3):297-312.
16. Kok G, Peters LW, Ruiter RA. Planning theory-and evidence-based behavior change interventions: a conceptual review of the intervention mapping protocol. Psicologia: Reflexão e Crítica. 2017; 30(1):19.
17. Mirzaei-Alavijeh M, Ahmadi-Jouybari T, Vaezi M, Jalilian F. Prevalence, cognitive and socio-demographic determinants of prostate cancer screening. Asian Pacific Journal of Cancer Prevention 2018; 19(4):1041-1046.
18. Hagger MS, Chatzisarantis NL, Biddle SJ. A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive validity and the contribution of additional variables. Journal of sport and exercise psychology. 2002; 24(1):3-32

19. Armitage CJ. Can the theory of planned behavior predict the maintenance of physical activity?. Health psychology. 2005; 24(3):235-245.
20. Steinmetz H, Knappstein M, Ajzen I, Schmidt P, Kabst R. How effective are behavior change interventions based on the theory of planned behavior? A three-level meta-analysis. Zeitschrift für Psychologie. 2016; 224(3): 216-233.
21. Golan M. Parents as agents of change in childhood obesity_from research to practice. Pediatric Obesity. 2006; 1(2):66-76
22. Law EF, Fisher E, Fales J, Noel M, Eccleston C. Systematic review and meta-analysis of parent and family-based interventions for children and adolescents with chronic medical conditions. Journal of pediatric psychology. 2014; 39(8):866-86
23. Sung_Chan P, Sung YW, Zhao X, Brownson RC. Family_based models for childhood _ obesity intervention: a systematic review of randomized controlled trials. Obesity Reviews. 2013; 14(4):265-78.
24. Brown HE, Atkin AJ, Panter J, Wong G, Chinapaw MJ, Sluijs EM. Family _based interventions to increase physical activity in children: a systematic review, meta _ analysis and realist synthesis. Obesity reviews. 2016; 17(4):345-60.
25. Mirzaei-Alavijeh M, Kok G, Niknami S, Motlagh ME. Family-based cognitive factors effective on preventing the onset of substance use in Iranian society's children: applying the intervention mapping protocol. Acta Medica Mediterranea. 2016; 32:1015-1020
26. Pearson N, Braithwaite RE, Biddle SJ, Sluijs EM, Atkin AJ. Associations between sedentary behaviour and physical activity in children and adolescents: a meta_analysis. Obesity reviews. 2014; 15(8):666-675.
27. Norman P, Conner M. The theory of planned behavior and exercise: Evidence for the mediating and moderating roles of planning on intention-behavior relationships. Journal of Sport and Exercise Psychology. 2005; 27(4):488-504.
28. Thompson EL, Vamos CA, Daley EM. Physical activity during pregnancy and the role of theory in promoting positive behavior change: A systematic review. Journal of sport and health science. 2017; 6(2):198206..
29. Jekauc D, Völkle M, Wagner MO, Mess F, Reiner M, Renner B. Prediction of attendance at fitness center: a comparison between the theory of planned behavior, the social cognitive theory, and the physical activity maintenance theory. Frontiers in psychology. 2015; 6:121

30. Jalilian F, Matin A, Mahboubi M, Rahimi S, Fazel Z, Juibari T, et al. Predicting factors related to regular physical activity among Iranian medical college student: An application of Health Belief Model. Social Sciences. 2016; 11(15):3688-3691.
31. Levy SS, Cardinal BJ. Factors associated with transitional shifts in college students' physical activity behavior. Research quarterly for exercise and sport. 2006; 77(4):476-85.
32. Soltani R, Ali Eslami A, Mahaki B, Alipoor M, Sharifirad G. Do maternal oral health-related self-efficacy and knowledge influence oral hygiene behavior of their children?. International Journal of Pediatrics. 2016; 4(7):2035-42.