



Elaborating Factors Affecting Maternal Nutritional Behavior; A Qualitative Approach

**Seyed Saeed Mazloomi Mahmoodabad¹, Fatemeh Jowzi^{2*},
Hassan Mozaffari-Khosravi³, Aliakbar Vaezi⁴ and Hosein Fallahzade⁵**

¹*Social Determinants of Health Research Center, School of Public Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.*

²*Department of Health Education and Promotion, Social Determinants of Health Research Center, School of Public Health, Shahid Sadoughi University of Medical sciences, Yazd, Iran.*

³*Department of Nutrition, Faculty of Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.*

⁴*Department of Nursing, Research Center for Nursing and Midwifery Care in Family Health, School of Nursing and Midwifery, Shahid Sadoughi University of Medical Science, Yazd, Iran.*

⁵*Department of Biostatistics and Epidemiology, Research Center of Prevention and Epidemiology of Non-Communicable Disease, School of Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran.*

Authors' contributions

This work was carried out in collaboration among all authors. Authors SSMM and FJ and HMK designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Author FJ managed the literature searches. Authors AV and HF managed the analyses of the study. All authors read and approved the final manuscript

Article Information

DOI: 10.9734/JPRI/2019/v31i630373

Editor(s):

(1) Rafik Karaman, Professor, Bioorganic Chemistry College of Pharmacy, Al-Quds University, Jerusalem, Palestine.

Reviewers:

(1) Jurandy Santos Nogueira, Federal University of Bahia Ondina Campus, Brazil.

(2) Mahama Bashiru, College of Nursing and Midwifery Nalerigu-North East Region, Ghana.

(3) Maria Demetriou, Metaxa Memorial Cancer Hospital, Greece.

Complete Peer review History: <http://www.sdiarticle4.com/review-history/53691>

Original Research Article

Received 28 December 2019

Accepted 01 January 2020

Published 07 January 2020

ABSTRACT

Introduction: Excessive consumption of confectionary can contribute to a high intake of sugar, fat and energy which lead to tooth decay, weight gain or obesity and related metabolic diseases. This study conducted to identify the effective factors on mothers' nutrition behavior (reduction of confectionary consumption) on the basis of health action process approach.

*Corresponding author: E-mail: fjowzi@gmail.com;

Methods: This qualitative research has been conducted through Directed Content Analysis. Data were collected through semi structured interviews. Participants were mothers who had at least one child over 6 months and consumed all sorts of confectionary. The collected data were analyzed according to Granheim and Landman's method.

Results: The analysis of the interviews data resulted in 87 codes. The codes were organized into 6 categories and 26 subcategories and the 5 main themes are as follows: action planning, coping planning, action control, maintenance self-efficacy and social support

Conclusion: Our study suggested that one of the community supports is media education and it should be considered in implementing community-based educational programs

Keywords: Confectionary consumption; mother; health action process approach; qualitative study.

1. INTRODUCTION

Generally speaking, chronic and non-communicable diseases (e.g, type 2 diabetes), cardiovascular disease, hypertension and fatty liver disease cause more deaths worldwide than infectious diseases [1,2]. These diseases are currently the leading cause of death worldwide and are expected to be the same by 2030 [3,4]. According to the World Health Organization (WHO), approximately, 38 million people die of chronic diseases worldwide each year [3]. In Iran, 76.4% of deaths are due to non-communicable diseases [5]. Added sugars are calorie sweeteners that are added to foods and drinks during production or preparation [6]. In confectioneries, mostly glucose and sucrose are used as added sugars because of their being cheap and abundant. Excessive consumption of confectionery leads to a high intake of sugar, fat and energy, which are involved in tooth decay, obesity, and obesity-related metabolic diseases [7].

Added sugars' consumption is associated with an increased risk of obesity and cardiovascular disease factors such as hypertension, diabetes, non-alcoholic fatty liver and even cancers [8-9]. However, diabetes is spreading rapidly and is a major global health concern in the 21st century. It is estimated that the incidence of diabetes will double by 2035 [10]. According to the International Diabetes Federation, there are about 425 million cases of diabetes worldwide. Around 4.9 million diabetes cases were reported in Iran [11].

Worthy of mentioning, cardiovascular disease is also a leading cause of death worldwide [12]. Studies show that one of the dietary patterns in Iran is the consumption of sweets [13]. It has been also found that mothers, for the reason of spending more time with children during meals have a greater influence on children's nutritional

behaviors [14]. There are numerous theories about health behaviors that each attempt to explain the reasons for performing or not performing health-related behaviors [15].

The health action process approach (HAPA) approach, developed in 1988 by Schwarzmeyer for the integration of social cognitive theory, the theory of reasoned action, and the volition theories of Heckhausen, Gollwitzer, and Kuhl, that bridges the gap between Intention and behavior because it clearly states the factors behind the intention to overcome this gap [16]. According to this approach, health behavior consists of two successive stages, the motivational and the volitional phase. In the motivational phase, intention to change health behavior is formed [17]. When the intention to perform a healthy behavior is formed, the motivational phase is completed. Then the volitional phase of the healthy behavior begins [18]. This phase focuses on self-regulatory strategies for behavior design, initiation and maintenance. These strategies include action planning, coping planning, action control, maintenance self-efficacy, recovery self-efficacy, and social support [16].

Qualitative methods provide a rich description and a deep understanding of human phenomena and experiences [19]. Qualitative research also identifies the meanings and interpretations of human behavior with a comprehensive and flexible view [20]. Therefore, considering the importance of this issue, the present study was designed and implemented to explain the factors affecting the nutritional behavior (reduction in the consumption of sweet) of mothers based on the health action process approach.

2. METHODS

According to the research question and based on the health action process approach, the research

has been conducted with a qualitative approach using directed content analysis to explain the factors affecting mothers' nutritional behavior (reducing sweets' consumption). In this way, the initial coding begins with a theory or with the related researches' findings [21].

The research populations were mothers with at least one+6 month child who used confectionery and tended to express their experiences in this study. These mothers were selected by purposive sampling with the most diversity in terms of age, occupation, education, and income. Semi-structured interviews (In-depth Interviews) were taken in 6 months and they were used for data collection. The length of each interview varies from 40 to 60 minutes depending on the interviewee's position and process, while all the interviews were recorded. Interviews were conducted individually in a relaxed environment at the appropriate time and place where participants felt comfortable. At the very beginning of each interview, each of the following items including, the research objectives, and the individuals 'right whether to participate or to refuse in this study and at any time were fully explained to the subjects. In addition, a consent letter was filled by them, as well as the data confidentiality. Ultimately, they were informed about their voice recordings during the interview. They continued until data saturation, where data saturation was obtained after 15 interviews.

The questions were open-ended and mothers were asked based on Health Action Process Approach (HAPA) self-regulatory strategy. As an instance, and to test Action Control strategy, you were asked what steps you take to continue reducing sugar consumption behavior and maintaining this change in behavior (less sugar consumption). Or, do you have more in-depth interviewing or interview questions? What do you mean? Why and how? Can you give an example? They were also asked when to conduct interviews and responding appropriately.

All interviews were transcribed verbatim and analyzed using Granheim and Landman content analysis approach. This approach main steps are word-for-word interviews and studying them multiple times to get a general feel, splitting the interviews into summarized semantic units, abstracting semantic units and assigning codes to them, breaking down basic codes into subcategories and categories that were based on similarities and differences and setting the themes as the texts 'hidden content indicative [22].

During this study credibility, dependability, conformability and transferability were considered to ensure data validity and reliability [23].

Long-term engagement with the topic and checking member findings with participants were used to establish credibility. External check was used to assess dependability. For this purpose, the interview, along with related codes and emerging classes were sent to several observers to review the analysis process and finally, commenting on its accuracy. To assess transferability, findings were shared with a number of mothers with similar characteristics that were not included in the study and ultimately, they confirmed the findings. Peer check was used to increase the conformity of all participants' statements on paper and to obtain others' opinions on the extracted codes.

3. RESULTS

Mothers' mean age in this study was 30.93 ± 10.20 with 18-48 age range. Their education levels were high school diploma (4), diploma (6) and (5) academic people. Mothers were housewives (6), employees (4), workers (3), and students (2). Four mothers had a child, six had two and five had more than two children.

Since the purpose of this study based on health action process approach was to explain the factors affecting nutritional behavior (reducing sweets consumption) from mothers' perspective, 87 codes were finally obtained by analyzing interviews and eliminating duplicate codes and merging similar items. They were divided into 26 subcategories, 6 categories and 5 main themes of action planning, coping planning, action control, maintenance self-efficacy and social support. They will all be explained separately in continue.

3.1 Action Planning

Action planning is the formation of plans to create a new behavior. In this study, mothers experience the programs that have been used to reduce the consumption of sweets [24]. This theme included two categories and several subcategories.

Most mothers stated that their desire to consume sweets made them want to consume it, so they sought to reduce this by eating a small piece of confectionery at parties and not skipping the confectionery front.

Mothers also cited that they tried to reduce their sweets' intake by walking, going to the pool, sports club, and park because they believed that by staying home they were more likely to consume sweets.

Some mothers stated that they use methods such as using dates instead of sugar to make homemade pastries to reduce sweets' consumption.

One of the mothers' plans to reduce sweets' consumption was to use nuts such as pistachios, almonds and walnuts instead of it. Also, one of the mothers' strategies for reducing sweets' consumption was to use vegetables and fruits.

Some mothers' comments were as follows:

"The times I have been at a ceremony, I try to eat a little pastry or try to avoid the confectionery route" (40-year-old mother, bachelor, employee with two children)

"If I am home, I am more interested in sweets. Going to the club and the park makes me more entertained and more tempted to have sweet." (38-year-old mother, Cycle, Housewife, 4 Children).

"I often make my own sweets instead of sugary sweets. I use natural pastries like dates to avoid confectionery." (46-year-old mother, high school diploma, Worker, 3 Children)

"One of the things I really don't like is pastry. Because I love pistachios, I often buy pistachios instead of pastry for home. If it's a pistachio, I wouldn't eat sweets at all." (19-year-old mother, high school diploma, homemade, 1 Child)

"I really like sweet so I make myself have fruits" (46-year-old mother, Worker, 3 Children).

3.2 Coping Planning

Coping planning is the post-action planning that involves anticipating the barriers that may impede the desired behavior change as well as ways to deal with such barriers [18]. The purpose of this study was to examine mothers' perceptions of the barriers to reducing sweets consumption and the strategies they used to reduce these barriers. This theme included two categories and several subcategories.

One of the barriers that most mothers raised to reduce their intake of sugar was their tendency to

consume sweets and their weak will to reduce consumption. In this study, some mothers expressed children's tendency to consume sweets that avoid them is having sweets. Some also discussed associating with colleagues and friends interested in sweets could be one of the obstacles to reducing sweets consumption.

Other barriers of sweets' consumption reduction that moms perceived were buying sweets at home, having sweets at home, and attending ceremonies and parties.

Some mothers' comments were as follows:

"I don't have a strong will to quit. And unfortunately, for a long time, I have a weak desire to eat."(28 year old mother, diploma, employee, 2 children).

"My desire for sweets is the most important obstacle to eating less." (31 year old mother, M. A., employee, with 1 child).

"One of the problems is that kids complain that you buy sweets and you eat when it is available at home."(40 year old mother, diploma, housewife, 4 children).

For example, we have some family friends who always make cookies and cakes when they come together and put them on the table and I see that they are eating, then I would like to eat. So this could be an obstacle. Or my roommate next door, they keep making different pastries and eating and drinking tea and I go and eat sweets. "(40 year old mother, bachelor, employee, 2 children).

"Sweets at home tempted you. When you have sweets at home, you will be unconsciously drawn to it.

Mothers proposed strategies such as yoga, study, and entertainment to overcome weak will.

To cope with the confusion of those children interested in sweets, mothers presented strategies such as educating about the dangers of sweets to reduce children's tendency to consume sweets, decreased relationships with colleagues and friends interested in sweets.

Mothers also suggested ways to restrict access to sweets, such as preventing buying sweets, and going to places where sweets were available. They proposed ways of overcoming the tendency to consume sweets, thinking about

the consequences of sweets and diseases associated with sweets consumption, meeting with diabetic patients, and observing the complications of diabetes.

Some mothers' comments were as follows:

"I go yoga to strengthen my will. To go for less sweet."(46 year old mother, high school Diploma, worker, with 3 children).

Have some fun with yourself not to go for sweets like going to a park, out, or reading something."(23 year old mother, bachelor, housewife, 2 children).

"I try not to go to the room of co-workers who eat a lot of sweets."(28 year old mother, diploma, employee, 2 children).

"Teaching kids about the dangers of eating sweets can reduce their tendency to cook."(21 year old mother, bachelor, student, 2 children).

"Not buying sweets as a solution. Not to go to places where there are sweets". (28 year old mother, diploma, employee, 2 children).

"There are things I observe like the time that a diabetic lost her kidneys. My sister's husband were in trouble with heart disease, and then after surgery his wound didn't heal after a year. That made me not to eat sweets, even the time I tempted." (40 year old mother, bachelor, employee, 2 children).

3.3 Maintenance Self-efficacy

Maintaining self-efficacy is essential to initiating and sustaining behavior change and refers to one's belief in their ability to sustain behavior change over a long period of time [18]. In other words, one's belief is to confront the barriers that occur during the behavioral maintenance period, so that they can act on their ability to perform behavior under challenging situations [25]. This study aimed to understand mothers' ability to reduce their confectionery consumption in challenging situations.

Most mothers believed that they could reduce their sweets 'consumption under difficult conditions such as anxiety, fatigue and depression. Participants also believed that even with tempting factors, such as the observation of sweets by those around, hunger and the temptation to open sweets were able to continue reducing consuming sweets.

Most mothers believed that even in challenging situations such as skipping in front of a pastry, attending parties and insisting family members to eat sweets could continue to reduce sweets consumption.

Some mothers' comments were as follows:

"When I am worried about something I love to eat but I have been able to control myself many times and eat soft"(19 year old mother, cyclist, housewife, 1 child).

It can be overwhelming at times, and I feel like the only thing that cures me is eating sweets, but I still had the ability to not eat. "(year old mother 23, bachelor, housewife, 2 children).

When I'm in a situation where I'm hungry, it's not too hard not to eat sweets. "(21 year old mother, bachelor, student, 2 children).

For a long time my friends and my wife insisted on eating sweets, but I cope it with myself and didn't eat. "(48 years old, diploma, employee, with 2 children).

3.4 Action Control

There is an ongoing monitoring process that occurs during this behavior and involves processes to manage the sequence of action and maintain long-term behavior change [16]. The purpose of this study was to examine the experience of mothers with constant monitoring the reduction in sweets' consumption.

The mothers in this study had self-monitoring experiences to reduce confectionery consumption, including posting a note in the kitchen to remind them of confectionery consumption, and note the daily confectionery intake in the notebook to its monitoring. They also repeatedly stated the purpose of reducing the consumption of sweets in their minds to monitor the reduction of sweets consumption.

Mothers expressed the consistent ways to monitor dietary intake, such as ongoing consultation with a nutritionist, ongoing monitoring of reduced intake of sweets at parties and parties, and ongoing monitoring of reduced intake of sugary foods during anxiety.

Most of the mothers in the study believed that they could not reduce the consumption of sweets at once, so they believed that they should gradually reduce the consumption of sweets.

Some mothers' comments were as follows:

"I keep on reviewing the dangers of sweets with myself so that I can come back to the sweets again and be careful not to sweat."(40 year old mother, bachelor, employee, 2 children).

"I used to write on the cabinet or in the kitchen that it was a waste of sweets so I wouldn't have to wait for my eyes to remember to eat sweets."(26 year old mother, bachelor, student, with 1 child).

"I used to write on the cabinet or in the kitchen that the pastry is harmful so don't eat it until I have it in my eye".(26 year old mother, bachelor, student, with 1 child).

"In certain places, such as birthdays and parties to bring sweets, I have a toddler who doesn't eat much and stop me."(28 year old mother, diploma, employee, 2 children).

3.5 Social Support

Social support represents a resource that can be effective in adopting or maintaining health behaviors [16]. Here's how mothers understand the resources that can help them reduce their consumption of sweets.

Mothers said that family members such as spouses, children, and parents play an important role in supporting them to reduce their consumption of sweets. Most mothers believed that health care professionals, such as nutritionists, physicians, and health professionals, played an important role in supporting them in adopting and maintaining reduced consumption behavior.

Mothers also believed that the media, such as television programs, radio programs, and newspapers and magazines, had an impact on adopting and maintaining a reduced consumption behavior.

"The family can support a lot. My kids are more likely to say no to sweets."(38 year old mother, cyclist, housewife, 4 children).

"Friends who care more about health and fitness can create a sense of competition in not eating sweets".(31 year old mother, master, employee, with 1 child).

"Nutritionists, health professionals I visit every now and then. The doctors I visit. They can help

me eat fewer sweets.)(39 year old mother, diploma, housewife, 3 children).

"When I read a magazine or newspaper and understand the complications of diabetes and diabetes, I unconsciously reduce consumption."(Mother of 23, bachelor, housewife, 2 children).

4. DISCUSSION

The purpose of this study was to explain the factors affecting the reduction of sweets' consumption from mothers' perspective based on Health Action Process Approach. According to this approach, in the voluntary phase in which the desired behavior begins, self-regulatory strategies including action planning, coping planning, action control, and maintenance self-efficacy and social support are important [16]. Therefore, the purpose of this study was to explain these mothers' self-regulation strategies to reduce sweets' consumption.

One of the self-regulating strategies is action planning. Action Planning Forms plans to specify the time, place, and how to convert to action [16]. It is important for eating behaviors, such as how to reduce the intake of sweets, to become intentional [26]. The study aimed to shape mothers' plans for how to reduce their consumption of sweets. In this study, mothers suggested different ways of planning to reduce their consumption of sweets. There has always been a strong tendency in humans to consume sweet foods such as sweets. Therefore, it is of utmost importance to employ methods to reduce this tendency for sweets in planning action [27].

It is also one of the strategies that mothers have proposed to reduce their sweets' consumption which is turning to exercise and recreation. As some studies show, people use sweet flavors to relieve stress and since exercise has an effective role in reducing psychological stresses [27-28], so exercise planning can be used to reduce the consumption of sweets. It can be one of the most effective strategies.

Planning to replace healthy foods such as nuts, fruits and vegetables instead of sweets is one of the strategies mothers studied to plan action to reduce sweets consumption. Since fruits and vegetables play an important role in preventing chronic diseases, including cardiovascular disease, cancers, diabetes and obesity, they are a good alternative to sweets [29].

Dates' use instead of sugar in making home-made pastries was another subcategory in this section. Various studies have shown that the nutritional behaviors of parents, especially mothers, can influence the nutritional behaviors of their offspring [30]. Also, since women are primarily responsible for purchasing and preparing food at home, it is also a good alternative to sugar since dates are a natural sweetener and are rich in minerals and vitamins [31]. Therefore, sweets' preparation using dates instead of sugar can be a useful strategy in planning action to reduce sweets' consumption.

According to many studies, action planning facilitates behavior [32-33]. Similar studies have also emphasized planning skills' role in changing nutritional behavior [34-35].

Coping planning is another component of the health action process approach. The plan included pairing the anticipated barriers to health behavior and self-regulation strategies to counter these barriers. Obstacles to healthy eating behaviors were the unhealthy foods' eating by people around, studied previously by Godinho, which made them tempted to eat unhealthy foods. Also one of the barriers perceived by mothers was sweets' availability, which in a similar study prevented the availability of unhealthy foods. One of the strategies mothers cited to lessen this barrier was to reduce or not purchasing pastries for using at home, which were approved by other studies [18]. Also, one of the barriers that mothers understood was the poor willingness to reduce sweets' consumption. And one of the strategies that mothers put forward to strengthen their will was to practice yoga [36]. Since some yoga exercises are capable of enhancing one's ability in different situations and having positive effects on one's cognitive and emotional functioning, it may also be effective in strengthening the will [37]. Of other strategies that mothers mentioned was to think about the consequences of eating too much sweets to reduce their sweets consumption.

Action control is another self-regulating strategy in the voluntary phase and there is an ongoing monitoring process that occurs during this behavior [16,38]. Mothers in this study had self-monitoring experiences to reduce sweets' consumption, including recording the daily intake of sweets in the notebook. As people become aware of their own behavior on a daily basis, they become aware of their own behavior and make more effort to maintain their behavior [38].

Therefore, in training interventions to improve practice control to reduce sweets' consumption, preparing a daily diary of the amount of sweets consumed can be helpful.

In terms of mothers' social support, family support, health education training and media education were identified as the most important factors in their support for reducing confectionery consumption. In Robinson's research, the family also plays a key role in people's nutritional behaviors [39]. Story also reported that the family influences people's food choices [40]. Numerous studies have shown that the higher the level of social support, the higher the level of health could be [41]. The obvious issue is that personal perception of the social support and satisfaction one receives from communicating with others can be a barrier to the consumption of sweets.

5. CONCLUSION

Due the fact that mothers believed that one of the community supports is media education, this point should be considered in implementing community-based educational programs through inclusive media such as Broadcasting medias. Also, given that mothers believed that social support is one of the mainstays of health education, it is important to consider training programs to reduce sweets' consumption.

CONSENT

As per international standard or university standard written patient consent has been collected and preserved by the author(s).

ETHICAL APPROVAL

As per international standard or university standard written ethical approval has been collected and preserved by the author(s).

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Rodríguez LA, Madsen KA, Cotterman C, Lustig RH. Added sugar intake and metabolic syndrome in US adolescents: Cross-sectional analysis of the National Health and Nutrition Examination Survey

- 2005–2012. *Public Health Nutr.* 2016; 19(13):2424–2434.
2. United Nations General Assembly. Political declaration of the high-level meeting of the general assembly on the prevention and control of non-communicable diseases; 2011. Available:http://www.un.org/ga/search/view_doc.asp?symbol=A/66/L.1 (Accessed January 2015)
 3. Mwenda V, Mwangi M, Nyanjau L, Gichu M, Kyobutungi C, Kibachio J. Dietary risk factors for non-communicable diseases in Kenya: Findings of the STEPS survey, 2015; *BMC Public Health.* 2018;18(Suppl 3):1218.
 4. Wagner KH, Brath H. A global view on the development of non communicable diseases. *Prev Med.* 2012;54:38–41.
 5. World Health Organization. Islamic Republic of Iran. Health Regional Office for the Eastern Mediterranean Islamic Republic of Iran Health Profile 2015. Geneva; 2016.
 6. Welsh JA, Sharma A, Cunningham SA, Vos MB. Consumption of added sugars and indicators of cardiovascular disease risk among US adolescents. *Circulation.* 2011;123:249-257.
 7. Zumbe A, Lee A, Storey D. Polyols in confectionery: The route to sugar-free, reduced sugar and reduced calorie confectionery. *British J Nutr.* 2001; 85(Suppl 1):31-45.
 8. Cantley LC. Cancer, metabolism, fructose, artificial sweeteners and going cold turkey on sugar. *BMC Biol.* 2014;12: 8.
 9. Bray GA. Fructose and risk of cardio metabolic disease. *Curr. Atheroscler. Rep.* 2012;14:570–578.
 10. O'Donnell M, Mente A, Rangarajan S, McQueen MJ, Wang X, Liu L, et al. Urinary sodium and potassium excretion, mortality and cardiovascular events. *N Engl J Med.* 2014;371:612–623.
 11. IDF MENA Members; 2019. Available:<https://www.idf.org/our-network/regions-members/middle-east-and-north-africa/members/35-iran.html> (Accessed Nov 17, 2019)
 12. Rippe JM, Angelopoulos TJ. Sugars, obesity and cardiovascular disease: Results from recent randomized control trials. *Eur J Nutr.* 2016;55(Suppl 2):45-53.
 13. Saadatnia M, Shakeri F, Hassanzadeh Keshteli A, Saneei P, Esmailzadeh A. Dietary patterns in relation to stroke among Iranians: A Case-Control Study. *J Am College Nutr.* 2015;34(1):32-41.
 14. Scaglioni S, Salvioni M, Galimberti C. Influence of parental attitudes in the development of children eating behaviour. *British J Nutr.* 2008;99(Suppl 1):22-25.
 15. Noar SM. A health educator's guide to theories of health behavior. *Int Q Community Health Educ.* 2005;24(1):75-92.
 16. Schwarzer R, Luszczynska A. How to overcome health-compromising behaviors: The health action process approach. *European Psychologist.* 2008;13:141–151.
 17. Schwarzer R. Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Appl Psychol – Int Rev.* 2008; 57:1–29.
 18. Godinho CA, Alvarez MJ, Lima ML. Formative research on HAPA model determinants for fruit and vegetable intake: Target beliefs for audiences at different stages of change. *Health Educ Res.* 2013; 28(6):1014-1028.
 19. Keshavarz Z, Simbar M, Ramezankhani A. Effective factors on nutritional behavior of female workers based on integrated model of planned behavior and self-efficacy: A Qualitative Approach. *Hakim Res J.* 2010;13(3):199-209.
 20. Parvizi S, Ahmadi F, pourasadi H. A qualitative study on social predisposing factors of adolescents' health. *Iran J Nursing.* 2011;24(69):8-17.
 21. Hashemnezhad H. Qualitative content analysis research: A review article. *J ELT Applied Linguistics (JELTAL).* 2015;3(1): 54-62.
 22. Graneheim UH, Lundman B. Qualitative content analysis in nursing research: Concepts, procedures and measures to achieve trustworthiness. *Nurse Educ Today.* 2004;24(2):105-12.
 23. Speziale HJS, Streubert HJ, Carpenter DR. Qualitative research in nursing: Advancing the humanistic imperative. Lippincott Williams & Wilkins; 2010.
 24. Inauen J, Tobias R, Mosler H J. Predicting water consumption habits for seven arsenic-safe water options in Bangladesh. *BMC Public Health.* 2013;13:1-10.
 25. Arbour-Nicitopoulos KP, Duncan M, Remington G, Cairney J, Faulkner GE. Development and reliability testing of a health action process approach inventory for physical activity participation among

- individuals with schizophrenia. *Front Psychiatry*. 2014;5:1-9.
26. Sheeran P. Intention-behavior relations: A conceptual and empirical review. In W. Eur Rev Soc Psychol. 2002;12:1-36.
 27. McDaniel AH. The human sweet tooth. *BMC Oral Health*. 2006;6(10):1-13.
 28. Jalilian M, Darabi M, Sharifirad G, Kakaei H. Effectiveness of interventional program based on trans-theoretical model to promote regular physical activity in office workers. *J Health Syst Res*. 2013;9(2): 188-195.
 29. Dauchet L, Amouyel P, Hercberg S, et al. Fruit and vegetable consumption and risk of coronary heart disease: A meta-analysis of cohort studies. *J Nutr*. 2006;136:2588–93.
 30. Golan M, Crow S. Parents are key players in the prevention and treatment of weight-related problems. *Nutr Rev*. 2004;62:39–50.
 31. Baliga MS, Baliga BRV, Kandathil SM, Bhat HP, Vayalil PK. A review of the chemistry and pharmacology of the date fruits (*Phoenix dactylifera* L.). *Food Res Int*. 2011;44:1812–1822.
 32. Chiu C, Lynch RT, Chan F, Berven NL. The health action process approach as a motivational model for physical activity self-management for people with multiple sclerosis. *Rehabil Psychol*. 2011;56(3): 171-181.
 33. Parschau L, Richert J, Koring M, Ernsting A Lippke S, Schwarzer R. Changes in social-cognitive variables are associated with stage transitions in physical activity. *Health Educ Res*. 2012;27(1):129-140.
 34. Guillaumie L, Godin G, Manderscheid JC, Spitz E, Muller L. The impact of self-efficacy and implementation intentions-based interventions on fruit and vegetable intake among adults. *Psychol Health*. 2012;27:30-50.
 35. Kreasukon P, Gellert P, Lippke S, Schwarzer R. Planning and self-efficacy can increase fruit and vegetable consumption: A randomized controlled trial. *J Behav Med*. 2012;35:443-451.
 36. Hadi N, Hadi N. Does Yoga Affect Health? *Hormozgan Med J*. 2006;10(3): 243-250.
 37. Najafi doulatabad SH, Nouryan KH, Malekzadeh GM, Ghaem H, Roozitalab M, Afraseyabifar A, et al. Effect of yoga exercise on General Health Status (GHS) and sense of life in patients with multiple sclerosis. *Armaghane Danesh J*. 2011; 16(30):245-253.
 38. Sniehotta F, Scholz U, Schwarzer, R. Bridging the intention-behaviour gap: Planning, self-efficacy and action control in the adoption and maintenance of physical exercise. *Psychol Health*. 2005;20(2):143–150.
 39. Robinson T. Applying the socio-ecological model to improving fruit and vegetable intake among low-income African Americans. *J Community Health*. 2008;33: 395-406.
 40. Story M, Kaphingst KM, Robinson-O'Brien R, Glanz K. Creating healthy food and eating environments: Policy and environmental approaches. *Annu Rev Public Health*. 2008;29:253-72.
 41. Reyahi MA, Verdinea AA, Porhosein Z. Study of the relationship between social support and mental health. *Social Welfare Quarterly*. 2010;10(39):84-121.

© 2019 Mahmoodabad et al.; This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

Peer-review history:
The peer review history for this paper can be accessed here:
<http://www.sdiarticle4.com/review-history/53691>