

## Behavioral Stages of Change in Calorie Balanced Dietary Intake; Effects of Decisional Balance and Self-Efficacy in Obese and Overweight Women

Abdmohammad Mousavi<sup>1\*</sup>, Mohsen Shams<sup>2</sup>, Mehdi Akbartabar Toori<sup>3</sup>, Ali Mousavizadeh<sup>4</sup>,  
Mohammad Ali Morowatisharifabad<sup>5</sup>

### ABSTRACT

The effectiveness of Transtheoretical Model constructs on dietary behavior change has been subject to questions by some studies. The objective of the present research was to study the relationship between self-efficacy and decisional balance as mediator variables and transfer obese and overweight women among the stages of behavior change of calorie balance intake dietary. **Method:** In this cross-sectional study, the data were collected through a survey. 448 obese and overweight 20-44 years old women were selected from three health facilities in Yasuj. Using a questionnaire ....demographic, anthropometric, stages of change, self efficacy and decisional balance were measured and analyzed. **Results:** Majority of demographic and anthropometric variables were not different significantly in different stages of change related to calorie intake except the pre-high school level of education ( $P=.047$ ,  $OR=502$ ,  $95\% CI= .255 \sim .990$ ). Self efficacy ( $F_{(4,425)}= 27.09$ ,  $P= .000$ ), decisional balance ( $F_{(4,394)}$ ,  $P= .004$ ), and pros ( $F_{(4,430)}=5.33$ ,  $P=000$ ) different significantly in five stages of change. However, the cons did not show a significant change in this regard ( $F_{(4,400)}=1.83$ ,  $P=.123$ ). **Conclusion:** Women movement through the stages of changes for calorie intake behavior can be predicted by self efficacy, decisional balance and pros.

**Keywords:** Transtheoretical Model, stages of change, self efficacy, decisional balance, calorie intake

### INTRODUCTION

The increasing prevalence of obesity becomes a public health problematic and costs for health services in future(Laws 2004). Obesity is the main cause of mortality in low income women(Povey, Conner et al. 1999) and is the fourth risk factor of early death(Anderson 2008) . Some complications such as diabetes mellitus, hypertension, high cholesterol level, and cardiovascular diseases, are related to obesity and overweight(Initiative 1998) . During the past two decades, the prevalence trend of overweight and obesity has been increasing worldwide, and will be increased continuously until 2030(Wang, McPherson et al. 2011) . In Iran, the trend of obesity and overweight is similar to the global trend and the condition is worse in women in comparison to men (Azizi, Azadbakht et al. 2005; Janghorbani, Amini et al. 2007; Mousavizadeh 2007) . Some systematic reviews have been done to show the role of low calorie intake in controlling the body weight (Moore, Summerbell et al. 2003; Tsai and Wadden 2005; Franz, VanWormer et al. 2007). Obtaining 30 percent of daily needed calories from fats and reducing 500 to 600 kcal of the daily calorie intakes will be effective approach in obesity and overweight prevention and reducing weight (Yu-Poth, Zhao et al. 1999; Astrup, Grunwald et al. 2000; Hill, Melanson et al. 2000; Astrup, Buemann et al. 2002). In many studies, education considered as a main strategy to reduce the whole calorie intake (Campbell, DeVellis et al. 1994; Sacks and Katan 2002; Lindström, Louheranta et al. 2003) .However, the main question is how to change nutrition habits and behaviors in target groups effectively. Health education theories and models explain behavior and suggest ways to predict and achieve behavior change, and guide the search for modifiable factors related to dietary change(Glanz, Rimer et al. 2008). The theory base interventions, introduce some constructs as the strongest predictors of the consequences of nutritional behavior that the common aspect among them are motivational factors such as pros and cons(decisional balance) and the self-efficacy as the source of behavior change (Baranowski, Cullen et al. 2003).

Transtheoretical Model(TTM) has been used extensively to identify intermediated variables associated with dietary compliance and consists of stages of change, self efficacy, decisional balance, and processes of change dimensions that have been defined elsewhere(McArthur and Pawlak 2011). The evidences related to the predicting power of self – efficacy, decisional balance(pros and cons), and stages of behavior in TTM framework are paradoxical in relation to dietary regime behavior change consequences, some studies have found as the strongest predictors(Prochaska, Velicer et al. 2004; Di Noia, Schinke et al. 2006; Johnson, Paiva et al. 2008; Di Noia and Prochaska 2010; Prochaska 2013) , and as claimed by some of the researchers, there are no strong research evidences(Baranowski, Cullen et al. 2003; Resnicow, McCarty et al. 2003; de Vet, de Nooijer et al. 2008; Armitage 2009). The objective of this research was to study the relationship between self efficacy and decisional balance as mediator variables on transfer among the stages of behavior change of compliance with calorie balance intake among the women of Yasuj city.

## **METHOD**

The data in this research are baseline ones which studied the predictors of behavior related to compliance with a balanced diet among obese and overweight women in the age range of 20-44 years. The participants were under the coverage of three health center of Yasuj city in which there are five similar centers. The intended centers were selected using a simple random method. Total of participants were 448 women. The women in the study were selected using a cluster random method and among the obese and overweight women ( $BMI \geq 25\text{kg/m}^2$ ). Recognition of the participants could be attained by the list of households under the coverage of health centers which prepared using annual census method. The women eligible to enter the research included non pregnant, non lactating, lack of prohibition to change dietary regime, lack of dietary regime under specialist consultation and with  $BMI \geq 25\text{kg/m}^2$  and the age range of 20-44 years. Written consent was taken from the participants and they answered the questions of a questionnaire, which is completed by trained inquirers through referring to houses during the months of June to July 2012. The proposal of the research was confirmed by the committee of postgraduate studies of faculty of health, Yazd university of medical sciences and also the ethics committee of the university has informed its approval by the official letter with reference number p/17/1819 dated 10-3-2012

## **MEASUREMENTS**

### **Demographic variables**

Demographic variables included, age marriage status(single, married, divorced, widow),level of education of the case and spouse (illiterate, primary, guidance, school, high school, associate, B.S., M.S, PhD), job of case and spouse(house wife, Government employed, private sector employed, un employed ),number of household members child, people under daycare of participant, pregnancies, deliveries.

### **Weight management**

The variables of using or not using weight management care from the local health center were measured as follows, based on self-reporting of the participants. Weight measurement (yes – no), height measurement (yes – no), waist measurement (yes – no), buttock measurement (yes – no), BMI measurement (yes – No ).

### **Stages of behavior change**

The TTM consists of five stages of change(pre-contemplation, contemplation, preparation, action, maintenance) represent the temporal, motivational, and consistency of behavior change (McArthur and Pawlak 2011). At first the participants were present with a definition of balance intake dietary with a content that the purpose of balance intake dietary is the use of at least all food groups daily, so that one will be able to reduce 5 to 10 percent of his/her weight by reducing average intake of 500 calorie daily and then she was asked to specify her present status in relation to the behavior of using balance intake dietary with regard to the following questions.

- 1- I have not so far compliance with balance intake dietary during meals, and I have not thought about it (yes –no).
- 2- I have not so far compliance with balance intake dietary during meals, but I have thought about it (yes –no).
- 3- I have not so far compliance with calorie balance intake dietary, but I am planning to do so within one month (yes – no).
- 4- Now it is less than 6 month since I am using calorie balance intake dietary during daily meals (yes – no).
- 5- Now it is more than 6 months since I am using calorie balance intake dietary during daily meals (yes – no).

The answer yes reveals that the participant is in that stage and the answer no reveals that she is in other stages (precontemplation=1, contemplation=2, preparation=3, action=4, maintenance=5). The validity of the questions was confirmed using expert panel (Table no. 1).

**Table1.** Psychometric properties of the Transtheoretical model's constructs measures related to Dietary Balance

Measures	Content Validity Index (CVI)	Cronbach's Alpha ( $\alpha$ )	KLMO & Bartellett's Test
Stage of change Ques	.92	-	-
Self-efficacy Ques	1	.81	.72
Pros Ques	.83	.59	.72
Cons Ques	.83	.51	.65

### Self-Efficacy

Self – efficacy as the confidence of persons on their ability in compliance with balance intake dietary in challenging positions was considered as mediator variable. With regard to the three self-efficacy subscales including Negative/Affective, Positive/Social and Difficult/Inconvenient(Ôunpuu, Woolcott et al. 1999) , in this research the Difficult/Inconvenient subscale was assessed . For assessment of self-efficacy in difficult situations, eight questions were designed . The stem of all questions began with the phrase "How much you are confidence that you can " and included situations like the need to much personal efforts ( one question), finding a solution upon facing with obstacles (four questions including, facing with obstacles in general, during trip, lack of appropriator place to prepare food, lack of support from family or friends ), compliance with calorie balance intake dietary without getting help from others ( one question), resuming compliance in case relapsing ( one question). The answers to the questions were designed in the form of 5 optional Likert scale (completely confidences = 5, ..., not confidence at all = 1). The validity of questions were confirmed using expert panel, and the reliability took place, using a pilot test of answering the questions by 40 women who were in conditions similar to the women participating in the research. Factor analysis confirmatory was used to confirm self efficacy construct validity (Table 1).

### Decisional Balance

The TTM consists of decisional balance construct assesses the perceived barriers (cons) and benefits (pros) associated with the adoption of healthy behavior(McArthur and Pawlak 2011). Decisional balance for calorie balance intake dietary was assessed using a questionnaire with 11 questions. Pros and cons were assessed each by 6 and 5 questions, respectively. The questions on assessing pros including delight arisen from using balance intake dietary (one question), positive effects on bodily fitness (one question) , positive effects of comfort sleep (one question), positive effects on longevity (one question) , positive effects on increasing resistance toward difficulties ( one question), companionship with friends who using balance intake dietary ( one question). The answers to the questions were designed in the form of 5 optional Likert scale (very much = 5,..., very little = 1) .

Validity, reliability and factor analysis confirmatory of the pros were assessed using a method similar to the self-efficacy and the results are shown in Table 1. The questions on assessing cons included spending time for using balance intake dietary (one question), shame of express using diet in the parties (one question), difficulty with spending money to use diet (one question), difficulty with using balance intake dietary (one question), and give up other important tasks for using balance intake dietary (one question). The validity, reliability and factor analysis confirmatory of pros were also assessed (Table 1).

### Anthropometric

Measurement of height and weight based on the protocol of world health organization was performed at the residence of the participants by trained persons. measurement of weight was performed in terms of kg, using a digital balance, with an error of less than 100 grams, and of height was done using a ribbon meter and in terms of meter.

### RESULTS

The information related to demographic and anthropometric is shown in table 2. The distribution of participants in review of overweight and obesity was 43.6 % overweight (BMI= 25-29.99 kg/m<sup>2</sup>), 39.5% mild obesity (BMI= 30-34.99 kg/m<sup>2</sup>) and severe obesity (BMI ≥ 35 kg/m<sup>2</sup>) comprised 15.9% of all participants. The Generalized Linear Models (GLM) test showed that distribution of demographic and anthropometric variables (moderator variables) among the behavior change stages has not been significant except pre high school level of education (P= .047, OR = .502, 95% CI= .255 ~ .990). Post hoc test revealed that the pre high school difference in the precontemplation stage has been significant in comparison to the four next stages (contemplation p=.006, preparation p=.000, action p=.001, and maintenance p=.008). Distribution of the participants in terms of the stages of compliance with balance

**Table2.**Sample anthropometry and Demographic variables

Variable	N	Percentage	Mean	±SD	Min	Max	Variable	N	Percentage
Weight	446	100	77.56	11.22	57	154	Job		
Height	446	100	157.69	5.85	141	176	Housewife	332	74.3
Waist	446	100	95.82	11.31	57	151	Government Employed	57	12.8
Batook	446	100	109.40	8.82	67	162	Non Government Employed	21	4.7
BMI							Un Employed	37	8.3
Overall	446	100	31.19	4.26	25.05	60.16	Total	447	100
25-29.99 Kg/m <sup>2</sup>	193	43.6	-	-	-	-	House Members		
30-34.99 Kg/m <sup>2</sup>	175	39.5	-	-	-	-	1-4	234	52.30
≥35 Kg/m <sup>2</sup>	75	16.9	-	-	-	-	5-6	169	37.80
Age							Over6	44	9.80
Overall	446	100	33.49	6.62	20	44	Total	447	100
20-31	194	43.5	-	-	-	-	Child		
32-44	252	56.5	-	-	-	-	0-2	219	55.6
Marriage Status							3	94	23.9
Single	53	11.9	-	-	-	-	4-7	81	20.6
Married	388	86.8	-	-	-	-	Total	394	100.0
Divorced	6	1.3	-	-	-	-	Gestation		
Total	447	100	-	-	-	-	1-3	158	43.3
Literacy							3-9	207	56.7
Pre High school	158	35.3	-	-	-	-	Total	365	100.0
High school-College	175	39.1	-	-	-	-	House Responsible*		
Bachelor-Doctoral	114	25.5	-	-	-	-	0-3	113	25.3
Total	447	100	-	-	-	-	Over3	334	74.7
*;Numbers of whom of the home the participant is responsible for day care							Total	447	100.0

intake dietary were precontemplation (13.1%), contemplation (22.3%), preparation (41.3%), action (12.2%), and maintenance (11.1%), ( table 3). Distribution of the self-efficacy average scores from preaction-stage towards action-stage had an increasing trend of 3.08 to 4.1, and the decision of balance had an increasing trend from 1.8 in the precontemplation to 2.45 in maintenance (table 3).

**Table3.**Sumurise Statics of Sample self-efficacy, decisional balance, pros and cons by stage of dietary balance behavior

Variables	N	Percentage	Mean	±SD	Min	Max	Variables	N	Percentage	Mean	±SD	Min	Max
Stage of change							Pros						
Precontemplation	58	13.10	-	-	-	-	Pre contemplation	57	13.10	4.21	.50889	3.00	5.0
Contemplation	99	22.30	-	-	-	-	Contemplation	99	22.76	4.41	.53504	2.40	5.0
Preparation	183	41.30	-	-	-	-	Preparation	178	40.91	4.51	.50116	2.40	5.0
action	54	12.20	-	-	-	-	action	54	12.41	4.5	.49246	2.40	5.0
Maintenance	49	11.10	-	-	-	-	Maintenance	47	10.80	4.5	.40928	3.40	5.0
Total	443	100.00	-	-	-	-	Total	435	100.00	4.46	.51008	2.40	5.0
Self-efficacy							Cons						
Precontemplation	56	13.02	3.08	.71	1.63	4.5	Pre contemplation	51	12.59	2.427	.76840	1.00	4.0
Contemplation	98	22.79	3.32	.59	1.63	4.3	Contemplation	91	22.47	2.433	.71259	1.00	4.2
Preparation	174	40.47	3.67	.58	1.88	4.7	Preparation	172	42.47	2.283	.70085	1.00	4.2
action	54	12.56	3.85	.59	2.00	4.8	action	49	12.10	2.371	.70593	1.00	4.0
Maintenance	48	11.16	4.10	.57	2.63	5.0	Maintenance	42	10.37	2.123	.67564	1.00	3.8
Total	430	100.00	3.58	.67	1.63	5.0	Total	405	100.00	2.329	.71328	1.00	4.2
Decisional balance													
Precontemplation	51	12.78	1.8039	.9554	1.00	3.6							
Contemplation	91	22.80	2.0286	.9278	-.60	4.0							
Preparation	167	41.86	2.2479	.9275	-.40	4.0							
action	49	12.28	2.2531	.8294	.40	3.8							
Maintenance	41	10.28	2.4537	.8672	.60	4.0							
Total	399	100.00	2.1629	.9274	1.00	4.0							

**Table 4 .** One-Way ANOVA , Self-efficacy, Decisional Balance, Pros, Cons & Dietary balance behavior

Variable	df	F	Sig.
Self-efficacy	4,425	27.09	.000
Decisional Balance	4,394	3.98	.004
Pros	4,430	5.35	.000
Cons	4,400	1.83	.123

**Table5.** Predictor transition preaction to action stage of dietary balance behavior by self-efficacy, decisionalbalance, pros and cons

Parameter	Hypothesis Test			Exp(B)	%95 Wald Confidence Interval for Exp(B)	
	Wald Chi-Square	df	Sig.		Lower	Upper
Self-efficacy	38.366	1	.000	5.309	3.131	9.005
Decisional Balance	2.674	1	.102	.723	.490	1.067
Pros	1.134	1	.287	1.492	.715	3.114
Cons	2.674	1	.102.	1.383	.938	2.040

The average scores of the pros had also a progressive trend from the stages of preaction to action (4.22 ~ 4.56), and for the cons on the contrary, the changes has been approximately a decreasing trend (2.43 ~ 2.12) from the precontemplation to the maintenance. The difference of the average scores of the self-efficacy, decision balance, pros and cons of compliance with balance intake dietary in related to stage of change using One-Way ANOVA test are shown in table 4. Among the five stages, the changes of self-efficacy ( $F_{(4,425)} = 27.09$ ,  $P = .000$ ), decisional balance ( $F_{(4,394)} = 3.98$ ,  $p = .004$ ), pros ( $F_{(4,430)} = 5.35$ ,  $P = .000$ ) had significant differences, but the cons did not ( $F_{(4,400)} = 1.83$ ,  $p = .123$ ). The post hoc test showed that self-efficacy has not a significant difference between precontemplation and contemplation ( $p = .112$ ), while this two stages has been significant in comparison to the preparation, action and maintained ( $p = .000$ ). The individuals in preparation, did not make any difference to action ( $p = .341$ ), but have been significant to maintenance ( $P = .000$ ), and also there was no difference in action to maintenance ( $P = .191$ ). The changes of pros in precontemplation were not significant with contemplation ( $P = .120$ ), but has been different with preparation ( $P = .001$ ), action ( $P = .002$ ), and maintenance ( $P = .004$ ), but it had no significant difference in comparison contemplation in to other stages ( $P > .05$ ). It was also the same for preparation, in comparison to the action and maintenance ( $P > .05$ ). Also, action and maintenance did not have a significant difference ( $P > .05$ ). The changes of the cons in precontemplation was not significant in comparison to the four other stages ( $P > .05$ ), and a comparison of contemplation stage with other stages also showed the same results ( $P > .05$ ). No significant difference was observed in the comparison of preparation, action and maintenance stages ( $P > .05$ ). The results of pos hoc test for the decisional balance showed that changes of precontemplation was significant in comparison to preparation ( $P = .021$ ), and maintenance ( $P = .007$ ), while it was not significant for contemplation in comparison to other stages ( $P > .05$ ), preparation, with the action and maintenance ( $P > .05$ ), and action with the maintenance ( $P > .05$ ). Using GLM binary test, changes of self-efficacy, decisional balance, pros and cons between preaction and action stage, shows that only self-efficacy were significant ( $P = .000$ ,  $OR = 5.309$ ,  $95\% CI = 3.131 \sim 9.005$ ), while changes of decisional balance ( $P = .102$ ,  $OR = .723$ ,  $95\% CI = .490 \sim 1.067$ ), pros ( $P = .287$ ,  $OR = 1.492$ ,  $95\% CI = .715 \sim 3.114$ ) and cons ( $P = .102$ ,  $OR = 1.383$ ,  $95\% CI = .938 \sim 2.040$ ), were not.

## DISCUSSION

The Trans theoretical Model constructs, such as self-efficacy, decisional balance, pros and cons were tested as the objectives of the present study to determine the predictors of women transfer during the five stages of behavior change of compliance with balance intake dietary. In comparison the present study result with other studies baseline data related to Iranian and non Iranian individuals nutritional behavior, a general resemblance was observed in women Transtheoretical Model stage of change distribution including suffering from pre-diabetes, diabetes type 2, students and members of churches, so that ordinarily equal or more than 60% of the participants were in the pre-action stages, and equal or less than 40% in the action stages. In total, 76.7% of the participants were in the preaction-stages and 23.3% in the action-stages. Distribution for nutritional behavior of pre-diabetic was in preaction-stage 83.4% and action-stage 16.6% respectively, getting energy form fats, 63% and 37%, healthy eating 60% and 40%, and intake fruits and vegetables 79% and 26%, and on contrary, reducing fat intake in the American and Australian adults showed a reversed trend of about 40% in the preaction-stages and 60% in the action-stages (Laforge, Velicer et al. 1999). Only the pre high school level of education among the moderator variable related to the distribution of participating women between the five stages, was significant difference. The literacy relationship was known to be relevant with the behavior stages of smoking (Laforge, Velicer et al. 1999), and women physical activities shown to be on the borderline, although irrelevant ( $p = .05$ ) (Roozbahani, Ghofranipour et al. 2013). Because of the remarkable percentage of low literate and illiterate women participating in this study (35.3%) and the congregation of them in the precontemplation stage, the pre high school level of literacy had rather the role of an inhibitor and could justify a part of the reasons of women's stay in the precontemplation stage and the probable obstacles of women transfer to the next stages could be stagnancy of the activities relevant to consciousness raising which is influenced by the restrictions of reading ability.

The changes of self efficacy average scores had an increasing trend from the elementary to advanced stages and differences among behavior stages were significant. Steadily increase of self–efficacy among the five stages have repeatedly been confirmed by previous studies(DiClemente, Bellino et al. 1999; Rossi 2001). Although the self efficacy changes were not significant between precontemplation and contemplation, the differences between this two stage and the three next stage has been significant. This finding was also confirmed for the difference between the stage of preparation and maintenance, but it was rejected for preparation and action, action and maintenance. The findings support the assumption of TTM denoting mediator of self–efficacy in transferring the effects of intervention on women nutritional behaviors (Di Noia and Prochaska 2010; Salehi 2010; Mohammadi and Mahmoud abad 2013). With regard to relative constancy of self–efficacy average scores in the stages of preparation, action, and maintenance and the insignificance differences between this three stages, the low percentage of individuals in the action-maintenance (23%) compared to elementary stages (76%), could be related to self efficacy changes pattern on advanced stages and it's susceptibility to the motion of individuals between the mentioned stages, and also relapse(Rossi 2001). Significant changes confirmation of self–efficacy among the stages of preaction and action in this study supports the assumption of self–efficacy susceptibility to the change of nutritional behavior among the action-stages. In this study, susceptibility of Difficult/Inconvention self–efficacy subscale changes related to behavior stages of compliance with healthy diet was proved and is in consistency with the results of previous studies in change of nutritional behavior such as weight control, reducing fats and intake of fruits and vegetables(Rossi 2001; Salehi 2010) . Difficult/Inconvention application is useful for controlling over influencing interventions in preventing the risk of relapse(Rossi 2001), and there, it could be used appropriately in designing interventions effective in preventing relapse. Decisional balance has passed steadily increasing trend and significant differences among the five stage. However, the decisional balance changes in precontemplation was not significant compared with contemplation and action but has been significant compared to preparation and maintenance. These changes were not significant upon comparing the four stages of contemplation, preparation, action and maintenance with each other. Although the changes of pros among all five stages (4.22 ~ 4.57) were at a higher level compared to cons (2.43 ~ 2.12), and their curve of changes did not crossover along the stages, the differences of decisional balance in the stage of precontemplation compared to preparation and maintenance, confirms the assumption of Transtheoretical Model denoting the susceptibility of decisional balance to the motion among the stages of behavior.

With respect to the fact that changes of decisional balance was not significant among the stages of preaction and action is a confirmation to the assumption that decisional balance is rather an motivational construct, and its effects are rather on the motion between preaction-stages. The pros and cons behavior change pattern in this study was different from the finding of two studies, using the culture based decisional balance fruits and vegetables, and inhabitants of Pacific Ocean Islands(Chuan Ling and Horwath 2001). Increase in the scores of receiving pros of behavior change of taking fruits and vegetables in the contemplation stage, and decrease of the scores of its cons, in the stage of preparation was the Chinese participants decisional balance changes pattern and increase in the scores of receiving pros from cons in the stage of action was also the pattern of changes of decisional balance in the participants of Pacific Ocean Isands(Chuan Ling and Horwath 2001). Although, the results of this research on decisional balance have been confirmed by previous studies in relation to nutritional behaviors(Greene, Fey-Yensan et al. 2004; Nitzke, Kritsch et al. 2007), and physical activities(Sh, Nilsaze et al. 2006) , it's findings did not fully confirm the two manner changers of decisional balance including the pros and cons of behaviors change of compliance with balance intake dietary. Perception of the participating women from pros of compliance with balance intake dietary in parallel with the five stages of behavior had a growing trend and also simultaneously their perception from obstacles and difficult situations which are there in front of their behaviors has passed a falling trend, and contrary to the assumption of Transtheoretical Model, their curves of change did not crossover along the stages of behavior change. The significant changes of the pros between the stages of precontemplation and preparation, confirm the assumptions of Transtheoretical Model, that changes in the motivational stages are rather influenced by the perceptions of individuals from the pros of behavior change. Insignificance changes of this construct among the stages of preaction

and action in the present study is also an emphasis on supporting the intended assumption. The standard deviation interval of the pros between the two stages of precontemplation and action was equal to  $-.02$ , and for the cons equal to  $.06$ , which is not consistent with guideline of strengths, and weakness (Prochaska 1994). In accordance with the guideline change of standard deviation for the pros equal to 1 and cons, equal to  $.05$  is a proper pattern of changes of these two constructs. Generally the findings of this study on the changes of the cons are contrary to the assumption of TTM.

## CONCLUSION

Findings of this study confirmed a specific pattern of constructs such as self efficacy; decisional balance and pros, which were predicting the motion of women, among the stages of behavior change of compliance with balance in take dietary. Self-efficacy was a good predictor for motion between action-stages and confirms the assumption of Transtheoretical Model in the context of compliance with balance dietary intake. The findings of this study could be a good guideline for designing stages of changes interventions in women weight control program and could be used to prepare stability of women to continue appropriate nutritional behaviors and abstinence from return to previous habits. Since, the present study was conducted under Difficult/Inconvenient situations; it is proposed to carry out more local studies for determining the effectiveness situation of two other self efficacy subscales including Negative/Affective and Positive/Social in the field of obesity and weight control of women. Decisional balance was a good predictor for the motion among the preaction motivational stages and could be a good guideline for creating desire interventions in women nutritional and weight control programs.

## STUDY LIMITATION

These data have been taken from a descriptive study and their power is restricted in drawing conclusion of the predictors of behavior. More over these data have collected from participants who have participated in the study voluntarily and with satisfaction, which increases the probability that the participants have been in the stage of preparation for behavior change.

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\*1-M.S., Ph.D. candidate in Health Education. Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

2- M.D., Ph.D. in Health Education. Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

3-Ph.D.in human nutrition. Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

4-M.D., Ph.D. in epidemiology. Social Determinants of Health Research Center, Yasuj University of Medical Sciences, Yasuj, Iran

5-Associate Professor in Health Education. Health Education and promotion Department, School of Health, Shahid Sadoughi University of Medical Sciences, Yazd, Iran

**\*Corresponding Author's Address:** Dr. Mohammad Ali Morowatisharifabad, School of Health, Yazd Shahid Sadoughi University of Medical Sciences, Daneshjoo Blvd, Yazd, Iran, Zip Code: 89161-88638, Mobile +98 913 353 0374, Home +98 351 8211450, Office +98 351 6240691 , E-mail: [morowatisharif@yahoo.com](mailto:morowatisharif@yahoo.com)