

Effect of an Educational Intervention Based on Construal Level Theory on Decision Making in Adolescents with Premenstrual Syndrome

Mahin Delara,¹ Fazlollah Ghofranipour,^{*1} Parviz Azad-Fallah,² Sedighe Sadat Tavafian,¹ Anoushirvan Kazemnejad,³ Mehdi Kooshki⁴

1. Department of Health Education, Tarbiat Modares University, Tehran, Iran
2. Department of Psychology, Faculty of Human Sciences, Tarbiat Modares University, Tehran, Iran
3. Department of Vital Statistics, Tarbiat Modares University, Tehran, Iran
4. General Physician, Health Center, Sabzevar University of Medical Sciences, Sabzevar, Iran

Article information	Abstract
<p>Article history: Received: 13 Oct 2011 Accepted: 10 Nov 2011 Available online: 20 May 2013 ZJRMS 2014; 16(1): 17-22</p> <p>Keywords: Premenstrual syndrome Adolescents Decision-making</p> <p>*Corresponding author at: Department of Health Education, Tarbiat Modares University, Tehran, Iran. E-mail: ghofranf@modares.ac.ir</p>	<p>Background: In this study, the existing challenge about the association of construal level and temporal distance was examined. Doing so, the effect of two types of educational intervention on progress of decision making stages in students with premenstrual syndrome (PMS) was studied, based on theoretical concepts of construal level.</p> <p>Materials and Methods: The present study is a randomized field trial research conducted on 1578 high school students. A total of 255 students in the second stage of the precaution adoption process model were chosen randomly. They then went through educational intervention based on either low or high construal levels of relaxation method.</p> <p>Results: Subjects in the intervention group showed a higher decision-making stage progression than in control group ($p < 0.001$). The two-stage progression was significantly salient in low construal level-based intervention group ($p = 0.012$). None of the demographic, premenstrual, and premenstrual syndrome severity characteristics were related to this progression.</p> <p>Conclusion: Inducing low construal level causes an individual shift toward desired action more rapidly. That is, there is a correlation between construal level and temporal distance. To accelerate the adoption of any health behavior, temporal distance can be taken as a basic and essential topic.</p>

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Introduction

Millions of child-bearing aged women are with premenstrual syndrome (PMS). This periodically recurring syndrome is a combination of discomforting physical, psychological, or behavioral changes during the secretory phase of the menstrual cycle. A total of 85% of women report one or more symptoms and 1-2% report a number of disability symptoms [1].

The treatment objectives for this syndrome include reducing symptoms and their severity, and its effect on personal activities and relationships. As the first step, supportive treatments like relaxation therapy are recommended for all patients [2].

This syndrome, causing problems in the education and family relationships, and even suicide, is highly prevalent [3-9]. Some studies have reported 48.1 to 98.2% of prevalence of the syndrome [10-12]. A survey of high school students within Sabzevar reported the prevalence of 95%. The samples under investigation lacked the knowledge about PMS, so had done nothing to tackle it [13]. High prevalence of PMS among adolescents, the significance of immediate adoption of health behaviors, and existing challenges in construal level theory, have motivated researchers to design educational interventions based on this theory. Construal level theory provides a comprehensive framework about how temporal dimension

affects decision-making process and behavior adoption [13]. This theory maintains that people employ either low or high construal levels to understand the events [14]. High construal level consists of general and abstract properties of a phenomenon, and low construal level is based on concrete details and concepts of that phenomenon [13, 14]. In addition, how individuals interpret events depends on temporal distance of such events from the present time. According to this theory, people use high and low construal levels when they think about events in the distant future and in the near future, respectively. Similarly, interpretation based on high construal level leads people to postpone a behavior or an action. In contrast, employing low construal level helps individual to concentrate on desired activity enactment [14]. In other words, there is a relationship between temporal distance and construal level, either low or high. Liberman et al. exhibited this relationship in virtual world. In their study, the participants received short descriptions of a behavior, maintaining different construal level, and were asked to express their imaginations at the time of actual doing of the behavior [15]. In this study, doing a behavior or considering doing it was not actually evaluated. Therefore, they claimed that inducing low construal level to people leads them to expect a behavior to be performed in more near future, and vice versa. But

the main question goes: whether people actually perform the desired behavior in a shorter period of time or postpone it. The present study addresses the existing challenge [14].

Another point to be considered in designing educational interventions is that all people are not at equal level in decision-making process. Therefore, for improving efficiency of the interventions, individuals' decision-making stage should be determined first, and then designed for each stage [16]. For this purpose, a stage-oriented behavior change model, namely Precaution Adoption Process Model (PAPM), was used to design an appropriate intervention by selecting one of its stages. This model consists of following seven stages: 1) Unawareness, 2) not engagement, 3) deciding about acting, 4) decided not to act, 5) decided to act or be prepared, 6) acting, and 7) behavior maintenance. However, the stage 4 is not toward behavior adoption [16]. It is worth mentioning that, however, this model has been used for adopting behaviors such as radon testing, nutrition, prevention of osteoporosis, and several other cases, but there is no report on the use of this model for adopting health behaviors, especially with respect to PMS, within adolescent age range [16-25].

The objective of this study is to evaluate the designed intervention based on construal level theory in order to motivate students to perform relaxation technique. Through determining the construal level that makes more progress towards acting, effective intervention, the relationship between temporal distance and construal level can be found out.

Materials and Methods

This study is a parallel field trial research with both experimental and control groups. It was conducted from 2010 to 2011 in 6 high schools within Sabzevar. The research population included all female students with PMS within high schools in Sabzevar. Each of the studied schools was considered to be a cluster to prevent exchange of obtained educational interventions-related information between the students of the same school. Then, 6 out of the 33 schools within Sabzevar were chosen using random cluster sampling. The selected schools were grouped into two experimental and one control groups, utilizing random number table with a ratio of 2:2:2. That is, students of two schools went through educational intervention based on high construal level, and those of the two other schools went through educational intervention based on low construal level. Students of two remaining schools were taken as control group and did not receive any educational intervention during study time.

The total of 36 samples was determined to be required for the purpose of this study. Considering the probable 10% loss in the samples, at least forty subjects per group, and 120 in total, were estimated. However, 255 subjects were studied in this research. Inclusion criteria included: having PMS based on Premenstrual Assessment Scale (PAS), no history of using relaxation technique, and

tendency to participate in the study after providing written informed consent. Instruments used in this study were as following:

A. Premenstrual Assessment Scale (PAS): validity and reliability of this questionnaire had been determined in a separate study by the researchers.

B. Precaution adoption process model-based decision-making assessment scale: face and content validities of this questionnaire approve its items for evaluation of decision-making stages.

C. The reliability of the questionnaire was also confirmed using test-retest reliability evaluation. This form was employed for pre-test and post-test evaluations.

D. Demographic and menstruation characteristics questionnaire.

With respect to method of performing educational intervention it should be mentioned that based on following reasons the research team decided to provide students with educational programs through giving lectures and showing films: researchers' preliminary experiences regarding the priority of educational films in providing concepts in cognitive domains and in training practical skills, and regarding that associating lectures with other medias not only increases attractiveness of communication flow and prevents interruption due to boredom but also helps audiences with understanding the speaker [26].

For making an educational film in one of the experimental groups, low construal level of relaxation technique was used. It was done by providing concrete concepts and 17-minute step-by-step technique presentation, consisting 1670 words. In the second experimental group, abstract and general concepts of relaxation technique that maintain high construal level feature were used for educational film design. In addition, a number of 1670 words were used in this 13-minute film.

The process of project implementation was as following: in all chosen schools, PMS affected persons were first identified. Then, after coordinating with schools' authorities, educational sessions were hold, once and during training hours, for the students of each class. Before each educational session, pre-test form was distributed among volunteers for decision-making stage assessment. Then, subjects for the second stage of decision-making process were determined. For the following two reasons, the second stage of this model was employed. First, the second stage of precaution adoption process model is considered to be part of the stages prior to final decision-making. Second, implemented construal level based-interventions concentrate on pre-decision making stages. Eventually, after determination of desired persons, the participants were located into either experimental or control groups on the basis of intervention type assigned to each school. Immediately after educational intervention, post-test was carried out, and data were collected and analyzed using SPSS-16.

Descriptive-analytical statistics was used for the purpose of data analysis. Due to irregular data distribution, non-parametric Kruskal-Wallis tests and Spearman's test were deployed. Additionally, χ^2 test was also utilized to

compare progress of intervention groups throughout the stages.

Results

From the total of 1578 eligible students and volunteers to participate in the study, 938 cases were from four intervention schools and 460 subjects were from two remaining schools as control group. The preliminary evaluation showed that 255 persons (16.2%) were in the second stage of decision-making and had not yet engaged in deciding for relaxation technique adoption. The majority of them were single (91.7%) within the age range of 16-17 years (55%). In addition, mainstream of the students had experienced their first menstruation (menarche) between 13 to 14 years old. Their average menstrual bleeding took six days with menstrual cycle length of thirty days. 2.3% of the samples under investigation suffered from severe PMS (Table 1).

The Kruskal-Wallis statistical test did not show any differences between intervention and control groups with respect to demographic and menstrual characteristics, and PMS symptoms severity.

Frequency distribution of the subjects in the intervention and control groups, based on PAMM stages difference, is presented in table 2. As it is shown, most of students under low construal level-based educational intervention (40%) passed through two stages and entered fifth stage. Although, majority of the subjects under high construal level group (43%), as well as that of control group (64.9%) did not make any progress through the stages. The χ^2 test indicated a significant difference between all groups regarding number of stages they passed through ($p=0.001$)

The results from this study indicated at least one stage, or more) progression of intervention groups' subjects, in comparison to control group (95% versus 32%, $p=0.001$). This extent of progression was more salient in low construal level-based intervention group than in high construal level. However, χ^2 test did not suggest this difference statistically significant at level of 95% (67.7% versus 53.8%, $p=0.079$). Although, when the frequency distribution of data (with values less than 5) is more than 20% of table's cells, some table rows should be merged to

enable χ^2 test to assess observed differences. Therefore, for future analyses, those who refused to perform the action were removed and other conditions were investigated. Moreover, to have better understanding of the observed differences, ratio of each stage difference values was studied based on intervention type.

When the extend of one and two-stage progressions were compared separately in two intervention groups, the result showed that one-stage progression in low construal level-based intervene group was higher than in high construal level-based intervention group (32.3% versus 27.7%). This difference was more salient with respect to two-stage progression in low construal level-based intervention group (40% versus 21.5%). The statistical χ^2 test showed that the difference observed in the two intervention groups, based on two-stage progression, was significant (95% CI=1.21-5.02, OR=2.46, $p=0.012$).

Figure 1 depicts frequency distribution of subjects in different groups based on the extent of difference in pre and post-intervention stages. As can be seen in this curve, in contrast to the case of two-stage progression, one-stage progression in high construal level-based intervention group is greater than that in low construal level-based intervention group. In general, the extent of progression of intervention groups' subjects is greater than that of subjects in control group.

The results of this study also maintain that lack of stage shift and remaining at pre-intervention stage in high construal level-based intervention group is more common than in low construal level-based intervention group. However, this difference is not statistically significant (43% versus 30.8%, $p=0.119$). It is worth mentioning that in this study, none of the subjects under investigation progressed to the sixth stage of decision-making (or acting stage), after intervention. Pearson's correlation test did not show any correlation between number of stage difference and scores from PMS assessment, number of monthly bleeding days, menstrual cycle duration, chronological age, menarche age, body mass index, grade point average, and monthly income of family. In addition, χ^2 test did not show any significant correlation between stages differences and parents' job, marital status, staying in dormitory, field of study, and educational level.

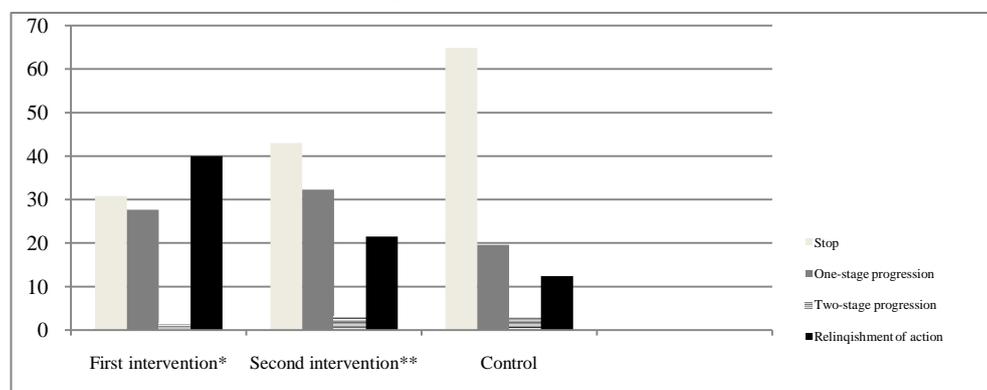


Figure 1. Frequency distribution of subjects in different groups based on the extent of pre and post-intervention difference

* The first intervention: low construal level based intervention; ** The second intervention: high construal level based intervention

Table 1. Frequency distribution of people at the second stage of PAPM, based on intervention group and demographic variables

Variable		First intervention* N(%)	Second intervention** N(%)	Control N(%)	Total N(%)
Age (yrs)	14-15	31(48)	41(44)	39(39.8)	111(43.5)
	16-17	31(48)	51(55)	58(60.2)	140(55)
	18-19	3(4)	1(1)	0(0)	4(1.5)
Lodging	Residential	0(0)	10(10.8)	35(36)	45(17.6)
	Non residential	65(100)	83(89.2)	62(64)	210(82.4)
Marital status	Single	54(83)	92(98.9)	88(91)	234(91.7)
	Married	11(17)	1(1.1)	9(9)	21(8.3)
Menarche age (yrs)	10-12	17(26)	26 (28)	29(29.9)	72(28.5)
	13-14	43(66)	55(59)	66(68)	164(64)
	>14	5(8)	12(13)	2(2.1)	19(7.5)
Body mass index	Low weight	36(55)	47(50.5)	39(40.3)	122(48)
	Normal	25(39)	42(45.6)	50(51.5)	117(46)
	High weight	1(1.4)	2(2.1)	4(4.1)	7(2.5)
Severity of symptoms of PMS	Obese	3(4.6)	2(2.1)	4(4.1)	9(3.5)
	Low	51(78.4)	66(71)	69(71.1)	186(73)
	Moderate	13(20)	25(27)	25(25.8)	63(24.7)
	Severe	1(1.6)	2(2)	3(3.1)	6(2.3)

* The first intervention is based on low construal level concepts; ** The second intervention is based on high construal level concepts

Table 2. Frequency distribution of the subjects based on the results from post-intervention stages evaluation

Stage	Group	First intervention* N(%)	Second intervention** N(%)	Control N(%)	Total N(%)
2		20(30.8)	40(43)	63(64.9)	123(48.2)
3		18(27.7)	30(32.3)	19(19.6)	67(26.3)
4		1(1.5)	3(3.2)	3(3.1)	7(2.7)
5		26(40)	20(21.5)	12(12.4)	58(22.8)
Total		65(100)	93(100)	97(100)	255(100)

* The first intervention is based on low construal level; ** The second intervention is based on high construal level

Discussion

The results of this study demonstrated that low levels construal of an action within a concrete framework would lead the person to imagine the desired acting in more near future, in comparison to the same action within a high-level vocabulary framework. In addition, he/she would actually shift more rapidly towards desired action, in the actual world. That is, there is a relationship between temporal distance of desired behavior and the present time, and between construal level in actual and practical worlds. In this regard, Trope states that low construal level leads person to focus on the current time of a phenomenon occurrence. While, high construal level shifts him/her beyond the current time, so he/she would expect a phenomenon to happen in more distant future [14].

The results, also, depicted that a higher number of subjects under high construal level-based educational intervention remained at their previous stage, i.e. second stage. That is, they postponed progression to the next stages. This delay was considered as postponement index and was more salient in high construal level-based intervention.

Postponement is a multilevel complex phenomenon that can be related to several factors such as the subject's behavior and personality characteristics [15, 27, 28]. Based on this perspective, the existing results are in consistent with that theory of construal level, which maintains that high construal level on a behavior not only leads the person to expect occurrence of a behavior in

more distant future, but actually postpones it. The results also indicate that none of the subjects progressed to the sixth stage, i.e. acting. However, this does not convey inefficiency of the designed intervention. From the beginning, the expected output was passing through decision-making stages. In this regard, Weinstein states that in terms of staging, the interventions which help individuals to progress towards acting stage are effective. Therefore, acting per se is not the only index for evaluating efficiency of an intervention [29]. In addition, shifting to the sixth stage requires resources, reminding guides, and other signs for enactment, which is not addressed here. The other reason for this constraint can be a few numbers of reported severe PMS (2.3%). In an Iranian study, it was determined that severity of the symptoms is a predictive factor passing through the stages [30]. Therefore, it should be noted that the likelihood of reaching the sixth stage is higher in those with severe PMS.

It is worth noting that construal level theory can be separately incorporated at each stage of PAPM by changing temporal dimension. However, the majority of studies conducted by Liberman et al. have been focused on early stages of decision-making [14]. In addition, Weinstein believes that his designed interventions for radon test plan have been a reflection of construal level concepts. According to the results from his radon test design, high construal level-based intervention is probably more effective for shifting from the third stage to the sixth. In addition, low construal level-based intervention is possibly more useful for passing through

stage 5 to 6; although, there is not any claim regarding the second stage.

Nonetheless, it is possible that by evaluating other stages of the model, temporal dimension becomes more salient within stage-distance framework. In this regard, it is recommended to evaluate and compare the use of this intervention in other stage of precaution adoption process model.

Examining the construal level theory in real world, especially in the field of health education, is the research's unique innovation. In a study of psychology students by Liberman et al., a list of short descriptions of different tasks was given to the participants and they were asked to read each description and imagine that the person is actually considering doing the action. Then, they were asked to estimate how much time from now the person would do that task. The result showed that after low construal level, the respondent expected the action to be done in more near future. Therefore, after low construal level, temporal distance from now to enactment would become shorter, in comparison to high-level construal [15]. The present research expanded the scope of recent studies and showed that construal levels actually affected passing through the stages and postponement phenomenon. In the present study, participants were asked to determine their current, actual and not imaginary, stage after watching the films. This is one of the strengths of this project, in comparison to studies performed by Liberman et al [15].

Following are of the other strengths of this project: using stage-based behavior change model for the first time through carrying out field trial study on individuals with PMS, reducing the chance of exchanging information between students by randomized selection of schools as clusters, and identical use of words in both films.

It should be brought up that the result from this research has been considered for the desired behavior, i.e. relaxation adoption. Therefore, different results are

possible for other behaviors relevant to PMS such as nutrition and exercise.

Nonetheless, the results of the present study are limited to the studied age range, i.e. adolescents, and may bring different outcomes for other age ranges. Overall, this research resulted in development of recent studies with respect to construal level theory and precaution adoption process model: those with a specific health problem are not at identical stage of decision-making process for adopting a counter action. People at early stages of decision-making respond to low construal level of a behavior more rapidly. The concepts of construal level can be evaluated and confirmed both in actual and virtual worlds. There is relationship between temporal dimension and construal level in actual and practical world. For that reason, temporal dimension plays an important role in progression of decision-making stages towards behavior adoption. Hence, it should be considered to be a fundamental and essential principle in designing educational packages in order to accelerate the adoption of any type of health behavior.

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Authors' Contributions

All authors had equal role in design, work, statistical analysis and manuscript writing.

Conflict of Interest

The authors declare no conflict of interest.

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