

The Effects of Health Education through Face To Face Teaching and Educational Movies, on Suburban Women in Childbearing Age

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Abstract

Background: The aim of the study was to compare the effects of 'face-to-face education' and 'educational movies' on 'knowledge' and 'practice' of women of child-bearing-age, in terms of health-care during pregnancy and during infancy in a suburban region near Tehran City, Iran.

Methods: In this quasi-experimental study, the sample included 873 married women. Questionnaires for knowledge and practice assessment were designed. The women were assigned to three groups: control (group I), face-to-face education (group II), and educational movie (group III). Knowledge questionnaires were completed before and immediately after intervention. Practice questionnaires were completed before and three months after intervention. Both questionnaires consisted of two types of questions: type A (concerning infant care issues) and type B (concerning prenatal health care).

Results: There was a significant difference in post-test knowledge between groups I and II and between groups I and III, but not between groups II and III. In terms of post-test practice, the changes were determined for every individual question, and significantly, better results were seen in group II, especially concerning type B questions.

Conclusion: Face to face education lead to better practice than educational movies. In addition, significantly better practice occurred regarding child health care issues rather than prenatal issues in both groups. Realistic and tangible issues, those easy to practice, and with little or no economical burden imposed on the family, progressed from the knowledge state to the practice state more successfully in both groups.

Keywords: *Child health-care, Prenatal care, Health education, Women, Suburban, Iran*

Introduction

Many authors all over the world have published the results of studies about the effects of health education on "knowledge" in different groups of people, and not surprisingly, most trials have shown positive results. Despite this fact, there remain many gaps in our overall knowledge about the outcomes and impacts of health education; for example: What are the effects of different educational methods (in this case, face to face education and educational films) on people's "knowledge" and "practice"? How does "practice" differ in response to different educational methods, despite an equal rise in knowledge? Does the topic of what is being taught

make any differences in how well it is learned and put to practice? Several studies have addressed these gaps in different ways. Most either have noted the discrepancy between awareness and behavior, or the difficulty and low overall effectiveness of changing behavior despite seemingly adequate amounts of knowledge, or have pondered over the factors influencing this discrepancy (1-8). The gaps in the complete understanding of this issue are even more in countries where local studies addressing it, are poor, lacking or of low quality. Malhotra et al. have pointed out to the low attention given to research on health education for certain areas of knowledge, such as food handling in developing countries

(9). The low quality of health education research has been especially demonstrated by Loevinsohn in a methodological review of published articles on health education programs in developing countries (10). Although people all over the world are similar in many ways, it is unwise to draw similar rules and regulations in terms of people's psychosocial behaviors in similar conditions. Iran is rather poor in terms of local studies that fill up the afore-mentioned gaps. Thus, although much is done for public awareness and numerous public awareness campaigns are implemented all over the country on different subjects, especially on health issues, spending large amounts of national budget and resources, very little is known about the true outcomes and impacts, based on the scarce amount of published reports in Iran.

The present study was performed to fill in some gaps in this area in the country, by comparing the effects of two educational methods, the face-to-face education and educational movies, on knowledge and practice of female residents of childbearing age living in a suburban region near Tehran, the capital city of Iran. The topics addressed were health topics somehow relevant to women of childbearing age, in one of the two main categories: a) health-care during pregnancy, and b) health-care during infancy.

Materials and Methods

This was a quasi-experimental study conducted in the year 2003 on 873 married women of childbearing age living in a suburban region (named Islamshahr) near Tehran, Iran. Islamshahr is rather a newly established society, the population of which is mostly immigrants from other cities around the country. Despite their proximity to the capital city, the residents are of a rather low economic and socio-cultural class. For easier access, the mothers of first graders in the elementary schools of the region were considered to represent the desired population. In this way, with cooperation of the elementary schools, the mothers could be invited to the school campus for implementing the study procedures.

At first three different sets of questionnaires for: demographic data (questionnaire no.1), "knowledge" assessment (questionnaire no. 2), and "practice" assessment (questionnaire no.3) were designed and validated in terms of face and content validity and reliability. The face and content validity was confirmed by a panel of 10 health-care and health education experts, in two focus group discussion sessions. The reliability was assessed by determining alpha cronbach for the knowledge and practice questionnaires, which was shown to be 89% and 79% respectively.

The "knowledge" and "practice" questionnaires (questionnaires no. 1 and 2 respectively) each consisted of 2 different types of questions: type A questions that dealt with health-care issues during pregnancy (which consisted of 25 and 21 questions in the knowledge and practice questionnaires, respectively), and type B questions that dealt with health-care issues in infancy (which consisted of 17 and 14 questions in the knowledge and practice questionnaires, respectively). The knowledge questions were meant to determine whether the participants knew about health issues in the two main categories mentioned before, and the practice questions were meant to determine whether the participants had practiced them during their last pregnancy and regarding their youngest child during his infancy period. Thus the comparison between pre and post-test results in terms of 'practice' of health issues during pregnancy was only possible in those women who were or became pregnant during the study period; likewise in terms of 'practice' of health issues regarding infant care, it was only possible to compare pre and post-test results in participants who had an infant child during that same period. Only these two groups of women were considered eligible for the post-test 'practice' assessment. Setting the eligibility criteria was done based on the study objectives, which are to determine whether women who were pregnant and those who actually had an infant child, did practice what they had learned. Obviously, there were no such limitations in terms of the 'knowledge' pre and post-test comparisons. Eighteen schools

(9 boys' schools and 9 girls' schools) were chosen with regard to the one and only inclusion criteria that was having at least 80 first graders. Actually, there were 19 schools meeting these criteria, so one was randomly excluded. The 18 remaining schools were divided into three groups, each group including six schools (3 girls' schools and 3 boys' schools) which were rather closer to one another geographically (for avoiding knowledge inter-dissemination between groups). Next, each of the three groups of schools was randomly assigned to one of the three study groups: group I (control group), group II (face-to-face education group), and group III (educational movie group). The sample size was calculated to be 61 in each of the three groups. Considering a design effect on sample size, it was determined to be 90 in each group. However, predicting a possibly low response rate for the post-test after 3 mo, it was finally decided that all women who participated in the pre-test session, be considered as part of the sample. Finally, 873 women participated in this study (group I= 261; group II= 317; group III= 295). The next step was to invite the women in each school to educational sessions, in groups of 40 to 50. Each woman attended only one educational session. In every class, the women participants were asked to complete the three sets of questionnaires: no.1 (demographic data sheet), no.2 (knowledge assessment questionnaire- serving as the pretest in knowledge), and no.3 (practice assessment questionnaire- serving as the pretest in practice). The control group did not go any further, whereas for groups II and III, proper intervention (face-to-face education, and demonstrating educational movies, respectively) was carried out, each about one hour long. The face-to face education was provided in the form of lecture, by the same tutor in all classes held for the 'face to face teaching group'. It included every subject that was included in the questionnaires. The participants had the right to ask questions for further clarification of what the tutor had taught. The educational film that was demonstrated for the 'educational movie group'

was previously produced specially for health education and public awareness purposes. It included short stories, with different direct or indirect health messages relevant to the subjects of interest. No questions were answered in this case. Immediately after the intervention, questionnaire no. 2 was completed for the second time, this time serving as the post-test in "knowledge assessment". About three months later, the women in all three groups were invited again. Without any further interventions, questionnaire number 3 was completed for the second time only for women fulfilling the eligibility criteria described before, this time serving as the post-test in "practice assessment". For the other women, questionnaire number 2 was completed for the third time, which is not the subject of the present paper. We were expecting to have approximately 100 pregnant women and 200 women with an infant in the sample, who would attend both pre-test and post-test sessions.

It is noteworthy that for women who were illiterate or not able to read the questionnaire, the questionnaire was read to them by the tutor.

In ethical terms, the women were invited and not enforced to attend the classes. They were also assured about the confidentiality of the information they registered on the questionnaires.

The data was analyzed using the SPSS statistical software, using non-parametric tests. *P*-values equal to or less than 0.05 were considered indicative of a statistically significant difference. The McNemar test was used to compare differences in knowledge and practice (between the pretests and post-tests) in terms of each single question separately.

Results

Table 1 shows the demographic characteristics of the three study groups, which had no significant differences in terms of: age range (mostly 21-30 yr old), educational status (mostly primary school), husband's educational status (mostly primary school), occupation (mostly housewives), number of family members (mostly 3 to 4), number of children (mostly 2), and type of marriage (mostly non-consanguineous).

As can be found in Table 2, the mean pretest scores in “knowledge” and the mean pretest scores in “practice” were similar in all three groups (with no significant differences).

According to Tables 2 and 3, the average “post-test” score in knowledge shows a significant difference between groups I (control) and II (face to face) ($P < 0.001$); and between groups I (control) and III (educational movie) ($P = 0.002$). There was no significant difference between groups II and III, although the mean raw score was higher in group II. The response rate in the case of post-test 'knowledge' assessment was 100% in both groups II and III, because the post-test was carried out immediately after intervention.

Response rate in the 'eligible' group of women (previously described in the methods section) for the post-test 'practice' was about 64% in pregnant women (64 participants) and 89% in women with an infant child (178 participants).

The change in pretest and posttest status of each individual question in the “practice” questionnaire was compared between the three groups by the McNemar test, such that at first the number of “incorrect answers” to a question in the pretest that had been converted to “correct answers” to that same question in the posttest (presented as a), and the number of “correct answers” to that question in the pretest that had possibly changed to “incorrect answers” in the posttest (presented as b), were determined, and the difference was calculated (a-b). Then for every question, for every type of questions (type A and B questions), and then totally, the McNemar test was utilized to determine the statistical significance. The results were then compared between the three study groups (I, II, III).

As can be observed in Tables 4, 5:

In either group A questions, group B questions, or on the whole (Total), the P -values show significantly better results in group II, compared with group I and II.

Either in group I, II, or III, the P -values were significantly higher in group B questions, which were questions dealing with healthcare during infancy.

When comparing p -values in terms of each question in the “practice” questionnaire individually, we observed that they showed significantly higher figures for some questions in comparison to other questions, at least in one of the study groups. These were mainly questions that either addressed very realistic and tangible issues of risk (in these cases the mothers probably felt that the risk was even closer and more serious and realistic), or those easy to practice, and with little or no economical burden imposed on the family, and thus successfully progressed from the ‘knowledge’ state to the ‘practice’ state. For example:

- 1- Question dealing with avoidance of infectious diseases during pregnancy, in group III ($P < 0.05$).
- 2- Question dealing with avoidance of infant swaddling, in group II ($P < 0.001$).
- 3- Question dealing with avoidance of childhood drug poisoning, in group II ($P < 0.001$).
- 4- Question dealing with avoidance of childhood chemical burns in group II ($P < 0.001$) and group III ($P < 0.01$).
- 5- Questions dealing with avoidance of childhood electrical burns in group II ($P < 0.001$) and in group III ($P < 0.001$).

Conversely, some questions did not show up in successful practice, in either of groups II and III, such as: 1- issues the practice of which, would impose an economic burden on the family (for example question dealing with nutritional recommendations during pregnancy, question dealing with acquiring ideal weight gain during pregnancy, and question dealing with dental health care during pregnancy), 2- issues that were somehow in conflict with the people’s customs, beliefs, values or habits (for example question dealing with avoiding traditional practices in neonatal hyperbilirubinemia, question dealing with avoiding consumption of unprescribed drugs during pregnancy, and question dealing with breastfeeding with the colostrum), and 3- issues the practice of which, were somehow impractical or hardly practical for this group of suburban mothers, mostly housewives, (for example question dealing with regular visits for health check-up and

control during pregnancy, question dealing with avoiding hard work during pregnancy and

question dealing with receiving enough rest during pregnancy).

Table 1: Demographic characteristics in groups I, II, and III

		Group I (%) (n = 261)	Group II (%) (n = 317)	Group III (%) (n=295)
Age(years)	21-30	50	50.5	48.1
	31-40	38.6	39.5	44.9
	>40	11.4	10	7
Educational status	illiterate	17.2	13.2	9.5
	Primary school or less	37.9	40.7	41.1
	Secondary school	31.4	36.6	34.7
	High-school diploma	13	9.1	14.6
Husband's educational status	Bachelor's degree or more	0.4	0.3	0
	Illiterate	7.8	6.5	4.5
	Primary school or less	46.3	42.5	36.9
	Secondary school	27.1	36.3	37.2
occupation	High-school diploma	16.1	14.4	18.6
	Bachelor's degree or more	2.8	0.3	2.7
	Housewife	96.9	98.1	98.3
	Out-door occupation	8.1	1.9	1.7
Number of family members	2	0.8	0	0
	3-4	51.2	50	51.9
	5-6	29.5	32.1	33.1
	>7	18.4	17.9	15
Number of children	1	15.3	16.7	15.9
	2	39.1	37.9	37.6
	3	14.9	19.2	21.4
	4	11.9	11.4	11.9
	>5	18.8	14.8	13.2
Type of marriage	Consanguineous	26.3	34.1	29.6
	Non-consanguineous	73.7	65.9	70.4

($P>0.5$)

Table 2: Pre-/post-test scores in "knowledge" and "practice", in groups I, II, III

		Group I		Group II		Group III	
		mean	SD	mean	SD	mean	SD
Pretest score In knowledge		25.4	5.7	26.3	5.6	26.8	5.4
Pretest score In practice	In group A	5.2	1.4	4.9	1.8	5.3	1.6
	In group B	2	1.3	1.9	1.3	2.1	1.3
Post test score in knowledge		25.4	5.7	29.5	5.4	28.9	4.7

$P>0.5$

Table 3: Comparison of post-test scores in knowledge between each of two study groups

First Group	Second Group	Mean difference	Significance (P-value)	95% Confidence interval
group I	group II	-3.864	<0.001	5.923_1.804
group I	group III	-3.656	0.002	6.024_1.087
group II	group III	0.308	0.965	2.536_3.152

Table 4: The change in pretest and post-test status of each group of questions in the practice questionnaire, in groups I, II, III

	Group A questions (health-care in pregnancy)			Group B questions (health-care in infancy)			Total		
	a	b	P-value	a	b	P-value	a	b	P-value
Group I	16	15	NS	59	35	$P < 0.05$	75	50	$P < 0.05$
Group II	38	16	$P < 0.001$	88	16	$P < 0.001$	126	32	$P < 0.001$
Group III	26	32	NS	84	28	$P < 0.001$	110	60	$P < 0.001$

NS: non-significant

Group A questions: questions dealing with health-care during pregnancy

Group B questions: questions dealing with health-care during infancy

a: the number of incorrect answers to any question in the “practice” pretest that had been converted to correct answers to the same question in the post test

b: the number of correct answers to any question in the “practice” pretest that had been converted to incorrect answers to the same question in the post test

Table 5: The significance of change in pretest and post-test status of each question in the 'practice' questionnaire, in groups I, II, III

Question number	Type of question	Subject of question	Group I	Group II	Group III
			Significance (P-value)	Significance (P-value)	Significance (P-value)
1	A	amount of light activities during pregnancy	NS	NS	NS
2	A	amount of heavy activities during pregnancy	NS	NS	NS
3	A	amount of rest during pregnancy	NS	NS	NS
4	A	use of simple unprescribed medicine during pregnancy	NS	NS	NS
5	A	use of important unprescribed medicine during pregnancy	NS	NS	NS
6	A	Genetic counseling during pregnancy	NS	NS	NS
7	A	Amount of food intake during pregnancy	NS	NS	NS
8	A	Type and diversity of food intake during pregnancy	NS	NS	NS
9	A	Amount of milk intake during pregnancy	NS	NS	NS
10	A	Amount of yoghurt intake during pregnancy	NS	NS	NS
11	A	Amount of meat intake during pregnancy	NS	NS	NS
12	A	Amount of fruit intake during pregnancy	NS	NS	NS
13	A	Amount of vegetable intake during pregnancy	NS	NS	NS
14	A	Amount of weight gain by the end of pregnancy	NS	NS	NS
15	A	Whether meat was completely cooked before use during pregnancy	NS	NS	NS
16	A	Whether eggs were completely boiled before use during pregnancy	NS	NS	NS
17	A	Contact with cats during pregnancy	NS	NS	NS
18	A	Contact with infectious patients during pregnancy	NS	NS	$P < 0.05$
19	A	Whether health-care visits were made continuously during pregnancy	NS	NS	NS
20	A	Dental care during pregnancy	NS	NS	NS

Table 5: Continued...

21	A	Visits to the dentist during pregnancy	NS	NS	NS
Total of Group A questions			NS	p<0.001	NS
22	B	Actions taken about neonatal hyper-bilirubinemia	NS	NS	NS
23	B	Actions taken about swaddling of the baby	NS	P<0.001	NS
24	B	Actions taken about feeding the baby with colostrum	NS	NS	NS
25	B	Actions taken about giving vitamin drops to the infant	NS	NS	NS
26	B	Time of start of supplement feeding	NS	NS	NS
27	B	Feeding with artificial milk	NS	NS	NS
28	B	Feeding with cow's milk	NS	NS	NS
29	B	Breast feeding	NS	NS	NS
30	B	Where in the house is medicine stored (in terms of height)	NS	NS	NS
31	B	Where in the house is medicine stored (in terms of locking facilities)	NS	P<0.001	NS
32	B	Whether electrical plugs at the house are properly covered	NS	P<0.001	P<0.001
33	B	Where in the house are detergents, blanching substances and other chemicals stored (in terms of height)	NS	P<0.001	P<0.01
34	B	Where in the house are detergents, blanching substances and other chemicals stored (in terms of locking facilities)	NS	P<0.001	P<0.001
35	B	Whether meat grinder machines are used in the presence of children	P<0.05	NS	NS
Total of Group B questions			P<0.05	P<0.001	P<0.001
Total			P<0.05	P<0.001	P<0.001

Discussion

The purpose of the present study was to compare the effects of face-to-face education and educational movies on knowledge and practice of female residents of a suburban area of Tehran city.

The knowledge scored immediately after the intervention (post-test scores in knowledge), rose significantly in both groups II and III, in comparison with the control group. This result is in concordance with numerous other studies of this kind, which have been carried out in different societies with different health education methods and techniques, and was thus totally expected (1, 9-14). Both methods (used in groups II and III) resulted in similar amounts of rise in knowledge immediately after intervention. This confirms our claim that equal amounts

of data and information concerning the different health issues were transferred to the two study groups through each of the two methods, and the information was equally up-taken immediately. This finding is similar to the results of another study performed in Iran by Taleghani et al., which showed a significant amount of rise in knowledge following nutrition education provided by two different methods that is guide-books and discussion groups, in comparison to the control group however showing no significant differences between the two methods (1).

As for the impact on behavior, different health education studies have shown different results, but one common point of view is that behavior change is much more challenging than change in knowledge (1-4, 7, 8, 13, 14). Since the ultimate goal of any education or awareness activity for

the general population is converting knowledge to better practice, it is important to realize that not all mal-practice occurs because of lack of knowledge. More than often, practice does not occur despite sufficient amounts of knowledge, which may have several reasons. "Human behavior and lifestyle" account for much of the disease burden in many countries. Successful behavior change is, however, difficult (3, 15, 16). In fact, the truth of health education's most fundamental adage is: "knowledge is a necessary but insufficient basis for social and behavioral change (17). A study carried out for evaluation of health education intervention on knowledge, attitude, and practice of food handlers in India, showed that there was a significant change in knowledge of study participants about hand hygiene measures, while self-reported hand-washing practices did not improve to the desired extent (9).

Our findings showed that in terms of practice, either in case of group A questions (questions dealing with health care during pregnancy) or in case of group B questions (questions dealing with health care during infancy), or on the whole (totally), there was a significantly better practice in group II, compared to groups I and III. This means that despite an equal amount of rise in knowledge in both groups II and III following education, it was the face-to-face education (group II) in comparison to the educational movie (group III) that promoted a significantly better 'practice' of the transmitted knowledge. This is somewhat in concordance with a study on either a rural population in Uganda (18), where it was concluded that the people had not received the proper and expected messages from theatre shows or video films. It seems that the socio-economic status of the audience is an important factor in this regard.

In addition, according to our findings, significantly better practice occurred regarding information that concerned child health care during infancy rather than healthcare during pregnancy. One possible explanation for the latter statement is that the women felt the risks concerning

their child much more realistically after the child was born than when it was not, and thus "practice" followed "rise in knowledge" more commonly. Probably after the birth of the child, the health care issues and the risks concerning it became more concrete and tangible, as did the child itself, whereas during pregnancy the mothers felt health care measures were directed mainly towards themselves rather than the child and could thus be easily overlooked.

This is in concordance with some studies, which show that "with populations at the highest risk level, more beneficial effects of behavioral change occur"(3, 18-20).

The possible explanation of 'higher risk perception', is further confirmed by the fact that in either of the groups II and III, the highest rise in practice scores occurred in terms of issues regarding steps to prevent or avoid childhood home accidents (such as drug poisoning, chemical burns, and electrical burns), possibly due to the fact that in these cases the mothers felt that the risk was even closer and more serious and realistic. "Risky or preventive behavior is often assumed to be determined by perception of risk" (21, 22). Risk perception is based on the perceived probability of occurrence of a specific undesirable event and of the consequences of that occurrence (21-23). In a study carried out by Sellstrom et al., causal attribution to the child was the only variable that predicted risk perception of mothers. The more the mother attributed the cause of the injury to the child and the less she perceived the skills of the child, the greater she judged the risk of injury (21).

In the case of preventing childhood home accidents, another possible explanation of the higher compliance on the part of the mothers, can be the easier accessibility to the simpler, more practical measures suggested (such as locking drugs and chemicals in a place too high to reach for the child, and covering the electrical plugs with plastic covers), which also normally impose little or no economical burden on the family.

When analyzing each question in the 'practice' section of the questionnaire individually, it seems

that some issues with the following characteristics did not show up in successful practice, in either of groups II and III:

- Issues, the practice of which would impose an economic burden on the family.
- Issues, the practice of which, were somehow in conflict with the people's customs, beliefs, values or habits.
- Issues, the practice of which, were somehow impractical or hardly practical for this group of suburban mothers, mostly housewives.

In contrast, seemingly very realistic and tangible issues, those easy to practice, and with little or no economical burden imposed on the family, successfully progressed from the 'knowledge' state to the 'practice' state.

This finding is in concordance with the results of a qualitative study of long-term behavior change in Oslo, in which the researchers identified 'barriers' as one of the five categories linked to the process of lifestyle changes (3). Another study in the USA found that high costs, perceived lack of time, and limited access to fresh products acted as barriers to practice of fruit and vegetable consumption (4).

One of the core concepts of social marketing is 'price', or in other words the material and psychological 'barriers', associated with the 'product', or in other words the 'bundle of benefits'. In addition, according to the social cognitive theory, the participant ascribes certain 'values' to the anticipated 'outcomes' of a behavior, which are called 'expectancies'. Positive and negative expectancies can promote or prevent behavior change, respectively (24, 25).

One other possible explanation for lack of practice despite sufficient amount of knowledge is the psychological phenomena called 'resistance', and 'reactance'. Resistance can be considered as the "clients' reluctance to consider data that do not confirm their existing worldview" (5, 26) or "the natural reluctance of humans to incorporate new information into their existing cognitive system" (5, 27). Reactance is "a motivational force that is aroused when perceived behavioral freedoms are reduced, elimi-

nated, or threatened and is directed towards the restoration of these freedoms" (5, 28, 29). From another point of view, that is, the principles of non-formal adult education, all adults have an array of life experiences and their decisions as to implement what they have learned depends on its 'immediacy' and 'personal meaning' (24).

The task is even more difficult when dealing with issues in contrast to or different from the customary habits, beliefs, culture or values of a group of people. Ambivalence is very common during the behavioral change process, with participants often having divergent feelings about current lifestyle habits and the prospect of change (24, 30). According to Thomas Dowd, "resistance or reactance may be aroused when core cognitive schemata of strong personal meaning or identity are perceived as being attacked. Changes that involve aspects of the self-concept may arouse unusual resistance. Reactant clients often fail to hear information they do not want to hear" (5). Many studies have shown a more effective use of cultural discourse in the development of health education programs, especially in the developing countries (31-33). It seems that "people tend to view health and disease from the perspective of their culture (31-33).

The same is true about issues seeming untangible, unrealistic or impossible to occur in the eyes of the audience. E. Thomas Dowd believes that "sub-clinical or preventive health regimens (such as inoculations) arouse more reactance than treatments for acute or serious conditions (5, 34). Since experiences suggesting feelings of susceptibility to a disease is considered to act as a motivation for health behavior change (3), it is possible that in such cases placing the audience in an actual situation, for example by role-playing methods or by visiting people actually suffering from real problems, will result in better outcomes. Vella believes that adults learn best when they do something with what they are learning and then reflect on what they have done (24, 35). It is noteworthy that many other factors can also interact and influence people's behavior and lifestyle changes that have not been adequately

addressed in the present study; such as was identified by Thomas A. Cable et al. and classified into the following 5 categories: 1- doctor-patient (or health professional-client) relationship, 2- significant others, 3- motivators, 4- barriers, and 5- empowerment (3).

The social class of the audience too, must not be under-estimated in the influence on desire for increase in health knowledge or the eagerness for change (6).

The present study had some limitations. For example, the participants' relatively low level of education caused some problems with completing the questionnaires. In addition, one of the major limitations was difficult accessibility to the participants 3 mo after the intervention for carrying out the post-test on 'practice'. This limitation turned out to have a more pronounced effect because of the eligibility criteria we had set for the post-test on 'practice'. As explained before, this was inevitable according to the objectives of the study. However, along with a total response rate less than expected, it resulted in a less than expected sample size for assessing the 'practice' 3 mo after intervention.

In conclusion, our results lead to the conclusion that face-to-face education had better impact on the audience in terms of practice, although the effect on knowledge was not significantly different from that of the educational movie. Additionally, significantly better practice occurred regarding information that concerned child health care during infancy rather than healthcare during pregnancy. In addition, very realistic and tangible issues, those easy to practice, and with little or no economical burden imposed on the family, progressed from the 'knowledge' state to the 'practice' state, more successfully.

Ethical Consideration

All Ethical issues (such as informed consent, conflict of interest, plagiarism, misconduct, co-authorship, double submission, etc) have been considered carefully.

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References

1. Taslimi TMM, Djazayeri A, Keshavarz SA, Sadrzade H, Yeganeh H, Rahimi A (2004). Comparison of the effectiveness of two nutrition education methods on the nutritional knowledge, attitude and practice of first grade school girl students in Tehran. *Tehran University of Medical Sciences Publications*, 2: 69-78.
2. Muturi N (2005). Communication for HIV/AIDS Prevention in Kenya: Social-Cultural Considerations. *Journal of Health Communication*, 10: 77-98.
3. Cable TA, Meland E, Soberg T, Slagsvold S (1999). Lessons from the Oslo Study Diet and Anti-Smoking Trial: a qualitative study of long-term behavior change. *Scandinavian Journal of Public Health*, 27: 206-12.
4. Yeh MC, Ickes SB, Lowenstein LM, Shuval K, Ammerman AS, Farris R, Katz DL (2008). Understanding barriers and facilitators of fruit and vegetable consumption among a diverse multi-ethnic population in the USA. *Health Promotion International*, 23(1): 42-51.
5. Dowd ET (2002). Psychological reactance in health education and promotion. *Health Education Journal*, 61:113-24.
6. Henshaw L (2001). The impact of class position on women's experience of receiving health education information whilst in hospital. *Health Education Journal*, 60: 241-55.
7. Kay E, Locker D (1998). A systematic review of the effectiveness of health promotion aimed at improving oral health. *Community Dent Health*, 15(3): 132-44.

8. Bettinghaus EP (1986). Health promotion and the knowledge-attitude-behavior continuum. *Preventive Medicine*, 15(5): 475-91.
9. Malhotra R, Lal P, Prakash SK, Daga MK, Kishore J (2008). Evaluation of a Health Education Intervention on Knowledge and Attitudes of Fool Handlers Working in a Medical College in Delhi, India. *Asia-Pacific Journal of Public Health*, 20: 277-86.
10. Loevinsohn BP (1990). Health education Interventions in Developing Countries: A Methodological Review of Published Articles. *International Journal of Epidemiology*, 19:788-794.
11. Atak N, Arslan U (2005). A pilot project to develop and assess a health education programme for type 2 diabetes mellitus patients. *Health Education Journal*, 64: 339-46.
12. Nuraini E, Parker E (2005). Improving Knowledge of Antenatal Care (ANC) among Pregnant Women: A Field Trial in Central Java Indonesia. *Asia Pac J Public Health*, 17: 3-8.
13. Manafa OU, Ahmed OA, Omotola BD (2006). Post-intervention Survey on the Knowledge, Attitude, Beliefs and Practices of People in Lagos State, Nigeria about HIV/AIDS. *World Health and Population*, 8(2): 35-45.
14. Kaur M, Singh K (2001). Effect of Health Education on Knowledge, Attitude and Practices about Anaemia among Rural Women in Chandigarh. *Indian Journal of Community Medicine*, 26(3).
15. Stamler J (1992). *Coronary heart disease epidemiology. From aetiology to public health*. Oxford: Oxford University Press, pp.: 35-66.
16. Marlatt GA, Gordon JR (1980). *Behavioral medicine: changing health lifestyles*. New York: Brunner/Mazel, pp.:410-52.
17. Gilkey MB, Earp JAL, French EA (2008). Applying Health Education Theory to Patient Safety Programs: Three Case Studies. *Health Promotion Practice*, 9: 123-29.
18. Mitchell K, Nakamanya S, Kamali A, Whitworth JAG (2001). Community-based HIV/AIDS education in rural Uganda: which channel is most effective. *Health Education Research*, 16: 411-23.
19. Ebrahim S, Smith GD (1997). Systematic review of randomized controlled trials of multiple risk factor interventions for preventing coronary heart disease. *BMJ*, 314: 1666-74.
20. Hjermann I, Holme I, Byre KV, Leren P (1981). Effect of diet and smoking intervention on the incidence of coronary heart disease. *Lancet*, 318 (8259): 1303-10.
21. Sellstrom E, Bremberg S, Garling A, Hornquist JO (2000). Risk of childhood injury: Predictors of mothers' perceptions. *Scandinavian Journal of Public Health*, 28:188-193.
22. Glik D, Kronenfeld J, Jackson K (1991). Predictors of risk perception of childhood injury among parents of pre-schoolers. *Health Educ Q*, 18: 285-301.
23. Slovic P (1982). *Taking Care: understanding and encouraging self-protective behavior*. Cambridge University Press, New York.
24. Ebbeling CB, Pearson MN, Sorensen G, Levine RA, Hebert JR, Salkeld JA, Peterson KE (2007). Conceptualization and Development of a Theory-Based Healthful Eating and Physical Activity Intervention for Postpartum Women Who Are Low Income. *Health Promotion Practice*, 8: 50-59.
25. Baranowski T, Perry CL, Parcel GS (2002). How individuals, environments and health behavior interact: social cognitive theory. In: *Health Behavior and Health Education. Theory, Research & Practice*, eds, Glanz K, Lewis FM, Rimer B. 3rd ed. Jossey-Bass Publishers, San Francisco, 165-84.
26. D. Meichenbaum D, Gilmore B (1982). *Resistance: psychodynamic and behavioral approaches*. Plenum, New York.
27. Dowd ET, Seibel CA (1990). A cognitive theory of resistance and reactance: Implications for treatment. *Journal of Mental Health Counseling*, 12: 458-69.
28. Brehm JW (1966). *A Theory of Psychological Reactance*. Academic Press, New York.

29. Brehm SS, Brehm JW (1981). *Psychological Reactance: A theory of freedom and control*. Academic Press, New York.
30. Miller WR, Rollnick S (2002). *Motivational interviewing: Preparing people for change*, 2nd ed. The Guilford Press, New York, pp.: 13-9.
31. Linn JG (2008). Community Participation, Cultural Discourse, and Health Education Projects in Developing Areas: The Case of the Radio Communication Project in Nepal. *Health Education & Behavior*, 85: 455-58.
32. Coe RM (1978). *Sociology of medicine*. 2nd ed. McGraw-Hill, New York.
33. Molebatsi K, Mulinge MM (2004). Indegenous discourses in the social construction of HIV/AIDS in Serowe Botswana. *Indilinga: African Journal of Indigenous Language Systems*, 3: 134-146.
34. Fogarty JS (1997). Reactance theory and patient noncompliance. *Social Science and Medicine*, 45: 1277-88.
35. Vella J (2002). *Learning to listen learning to teach: The power of dialogue in educating adults*. Revised edition. Jossey-Bass, San Francisco, pp. 1-288.