Evaluation of The Effectiveness of Behavioral Change Strategies on Choosing Delivery Method in Nulliparous Pregnant Women

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Introduction
Childbirth is a process without the need for intervention. According to the studies, 85% of normal deliveries do not require medical intervention and natural physiological process would be completed only by educating the mothers, providing care to mothers and their monitoring during labor, [1]. Caesarean rates have increased in recent years [2]. In Iran, 50-65% of deliveries were caesarean in 1388 and 90% of these operations carried out in urban areas and private hospitals [3]. Caesarean has complications such as bleeding, infection [4], infertility and postpartum depression [5]. Nowadays, caesarean rate has increased significantly due to unexplained reasons. Since there are no medical or obstetric suggestion to choose caesarean delivery, it is usually based on maternal requests [3]. Making decision to choose the delivery method is not easy and can be affected by many factors. The most important reasons for caesarean delivery on maternal requests include: Fear of pain during childbirth [6-8] fear of the unknown [9] and adverse experiences and encourage by others [7, 8], less pain during caesarean, less fetus trauma and no need to frequent...

Abstract
Purpose: To assess the effect of peer education on knowledge, attitude and the choice of delivery methods among nulliparous pregnant women.

Methods: In this randomized controlled trial, 300 nulliparous women (gestational age 24 to 32 W) in Boukan district during Feb to Aug in 2014, without normal vaginal delivery (NVD) ban, were randomly allocated into control and training groups with equal size of 95. Four weekly educational sessions were held for training groups. In the first intervention group, educational sessions were held by researcher and in the second intervention group, the participants were trained by the researcher and the experiences of their peers. A validated Questionnaire was used for data collection on primary outcomes of knowledge, attitude and performance concerning the choosing the delivery methods. Paired and independent t tests and analysis of covariance at the significance level of 5% were used to compare mean scores among groups.

Results: The results showed that, before education and in the researcher trained intervention group, 28.6% had a certain plan for vaginal birth, and 7.7% had a certain plan for caesarean, that after education increased to 66% and decreased to 4% respectively (P<0.001). In the peer education intervention group, the education increased certain plan for vaginal delivery from 33% to 57% and decreased the certain plan for caesarean from 16% to 3%, (P<0.001).In the control group, these changes were not significant (P>0.05).

Conclusion: Peer education intervention could be effective to increase the knowledge, to improve attitudes and to increase the intention of pregnant women choosing natural delivery method.
medical visits [10]. As can be seen, increased caesarean deliveries are not leading by medical emergencies, but the methods of delivery is often determined by false negative beliefs and attitudes [11]. The maternal requests make force for caesarean delivery even when there are no medical or obstetric hint [12]. The studies show an inappropriate level of knowledge among pregnant women [11, 13, 14]. Rahmati (2014) showed that knowledge and attitude of women would determine the delivery method and the majority of women who seek elective cesarean had a negative attitude toward vaginal delivery [15]. Also Mohammaditabar (2009) showed that 64% of women who had willingness to cesarean had minimum or no information about this type of delivery [13]. There are several studies which have shown that education could be effective on increasing the knowledge and can increase the rate of vaginal delivery [16-19]. Maimburg (2003), has reported that attending in childbirth preparation classes can help women so that they can better cope with labour problems [20]. In contrast in his study, Ryding (2003) reported that women who receive education on vaginal delivery had more fear than those who had not such a education [21].

There are different training methods for changing attitudes and improving the awareness. Moghaddam et al (2013), studied the effect of education of mothers by health care volunteers; and had no effect on reducing caesarean rates [22]. Lashghari (2005), evaluated the effect of education the mothers by films, lectures and pamphlets, and concluded that the intervention decreased the caesarean rate on mothers request [23]. Shahrazi in his study, encouraged women to do vaginal delivery in stead of elective cesarean section. This study evaluated the effect of group discussion and educational package. Results showed that group discussion was more effective to increase the motivation or decision making on vaginal delivery [24].

Peer education is another effective method. Peer learning style refers to a form of learning wherein learners are all in the same age and learning level [25]. The effect of this procedure have been evaluated and the effectiveness has been confirmed in studies concerning the nutrition education for students [26, 27], breast cancer self examination in students [28] and adolescent health education [29]. However, Kmalyykah et al (2012), stated that inappropriate peer education could have irreversible health consequences [30]: indistinct goals, lack of investment in peer education, insufficient training, lack of support from peer’s mentors and need for skilled personnel, are the main reasons of failure in peer education program [31].

According to the report by deputy of health of West Azerbaijan province, cesarean rate in 1391 among public sector was 38.2% and in the private sector was 57.84%;this situation is worrisome [32]. According to unofficial sources based on informal information, caesarean rate was 36%, in Boukan district in the first six months of 1392. Available statistics indicates the need for interventions to reduce the high rate of caesarean section. Given the contradicting results of studies and considering our best knowledge based on extensive search there is no study on the peer education, if any, on the mothers decision about the type of delivery in Iran, this study aimed to evaluate the effect of peer education on knowledge, attitude and choosing delivery method among nulliparous women. We hope that results of this study could help to improve the health status of mothers in this city.

Methods

Study participants

The present study was a randomized controlled clinical trial that conducted on 300 nulliparous pregnant women referred to health centers of Bokan during Feb to Aug in 2014. Inclusion criteria included: singleton pregnancy, being nulliparous, gestational age of 24-32 weeks, ability of reading and writing in persian language, age range of -18-35 years, no medical indication for cesarean; and exclusion criteria included: failure to attend training sessions, any additional conditions that makes caesared section a real indication. Sample size of this study was calculated regarding to knowledge primary outcome of knowledge in study groups, considering a power of the 90%, and alpha of 5% was estimated to be 80 per group. Taking into account for 20% attrition rate, finally the sample size increased to be 95 per group [23]. Random sampling proportionate to size of the center were performed; in each center the sample size corresponds to the total number of pregnant women referred to the center. After sample selection, the samples were randomly assigned in to study groups.

Random allocation

The participants were randomly allocated into three groups using randomized block procedures of size 6 [33]. Random Allocation software was used for randomization. The sequence were generated by the statistician of the study (MAJ). The allocation of the participants to the study groups was done by the researcher of the study (NA) The study was single blinded and the study participants didn’t aware of their allocation and to assure of the blinding the participants of different centers, with no possibility of the contact, were allocated to the different groups.

Interventions

For the first group, educational sessions held by researcher in 4 sessions each took long of 1.5 hours per week for a total of 4 weeks. All types of delivery methods, advantages and disadvantages of each, proper nutrition, proper stretching and breathing techniques were provided as the course content. In the second intervention group (trained by the researcher and the experiences of their peers), investigator at the beginning of each session lasting 20 minutes to get the required information, then the counterparts were asked about their experiences and were asked investigated the matter in conclusion investigators content. At the beginning of each session training and information offered by researcher, then counterparts were asked about their personal experiences about the topic. Considering the sample size (95 patients) in each group the number of peers was estimated to be 10 per group. The peers were chosen to participate in the study group in a such a way that to be more similar to that study group; they had experience of at least one vaginal delivery, and participated in physiological childbirth preparation classes. The control group received regular prenatal care. For all study groups there was a follow up during 8 to 16 weeks to complete the study concerning the women’s real choosing of delivery method (perfoamnce).
Measures

The parimary outcomes in this study included: knowledge, attitude and performance. Additionally information concerning some background variables included age (year), job (employed and houswife), education level (high sholl gratuated and university), education leel of spouse (high sholl gratuated and university) and the income level of family (500-800 and higher) were recorded. The instrument used was a self-descriptive questionnaire which was set in 5 parts. The first part was constructed of demographic characteristics (13 items), the second part was constructed of midwifery records (6 items), the third part was constructed of the knowledge questions (20 items), by “1: yes”, “-1: no” or “0: do not know” responses, the fourth section included questions about attitudes (13 items) by a likert five point responses which was rated as (5: strongly agree, 4: agree, 3: no opinion, 2:disagree, and 1:completely disagree); and finally the fifth part was constructed questions regarding to choose the type of delivery methods. The possible range of the knowledge score would be (-20 to 20) points and the possible range of attitude score would be 13 to 85.

Content validity of the questionnaire was assessed by 10 specialist in te field of midwifery and gynecology and obstetrics. Questionnaire was prepared based on the study of books, periodicals and with guidance of the supervisors, and then confirmed in panel of experts. The internal consistency reliability of the knowledge and attitude scales were confirmed (Cronbach’s alpha equal 0.78 and 0.70 respectively). Test-retest method utilizing Intra Class Correlation Coefficient (ICC) was used to determine stability reliability. In this regard, the questionnaire was completed by 30 qualified individuals, and then completed after two weeks by the same individuals; the reliability was confirmed for both knowledge and attitude scales (ICC=87%, ICC= 92% respectively).

Ethical issues

After obtaining permission from the Ethics and Research Committee of Tabriz University of Medical Sciences (code 92200) and obtaining consent from Urmia University of Medical Sciences and health center of Boukan, eligible women were found to recruit in the. Pregnant women were asked to attend an orientation session. They were assured that the the information will be confidential. Written informed consent was obtained from individuals, afterwards the questionnaires were completed. The study was registeed in the Iranian Registry of Clinical Trials (IRCT) with a code number of IRCT201403078170N4.

Statistical analyses

Data was summarized and reported using the mean (standard deviation) for quantitative variables and frequency (percentage) for qualitative variables. [34] Analysis of variance was used to compare quantitative variables and chi squared tests for qualitative variables among three groups. To compare measurements within groups between before and after the intervention, paired t-test was used [35]. SPSS 22 software (IBM SPSS Statistics, IL, Chicago, USA) was used for Statistical analyses. The significance level was set at 5% level.

Result

As it can be seen in the flow diagram of the study, 300 eligible women were enrolled after obtaining informed consent, after randomization were equally divided in the two intervention groups and one control group. Finally 91, 93 and 93 pregnant women were evaluated In the first and second intervention groups, and in the control group (Figure 1). Table 1 shows the demographic characteristics of participants in the groups. The demographic characteristics of study participant were not statistically differene among groups; pregnant women participating in the study were similar, in house type (P =-420) insurance (P=160), abortion (P=570), the source of information about delivery methods and Referral center for prenatal care. The mean age of mothers in all three groups were approximately 25 (SD 4) years, and the mean gestational ages were approximately 27 (SD 5) weeks. Of all participants,95% were housewives and 5% were employed (Table 1).

The results showed that before intervention, there were no significant differences between groups regarding knowledge and attitudes toward delivery methods. In researcher trained group) the average of pre-training score was 2.79 (in the range of -20 to 20) that significantly increased to 12.28 after the intervention. In peer education group the pre-training knowledge score was 3.95, that has significantly increased to 11.93 after the intervention, (P < 0.001) (Table 2).

The mean of attitude score researcher trained group raised significantly from 47.24 to 54.99, and in peer education

<table>
<thead>
<tr>
<th>Table 1. Demographic characteristics of study participants.</th>
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<tbody>
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<td>Demographic characteristics</td>
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<tr>
<td>Age</td>
</tr>
<tr>
<td>Job</td>
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<tr>
<td>Education</td>
</tr>
<tr>
<td>Education of spouse</td>
</tr>
<tr>
<td>Income</td>
</tr>
</tbody>
</table>

A: Researcher trained, B: Peer education, C: Control group, *The number and percentage of housewives in each group were considered, **The number and percentage of people who graduated from high school is considered, ***The number and percentage of people with incomes above 500-800 thousandis considered

<table>
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<tr>
<th>Table 2. Comparison of mean scores of knowledge and attitude in before and after intervention among study groups.</th>
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<tbody>
<tr>
<td>Study variables</td>
</tr>
<tr>
<td>Knowledge</td>
</tr>
<tr>
<td>Before education</td>
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<tr>
<td>After education</td>
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<tr>
<td>P-value</td>
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<tr>
<td>Attitude</td>
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<tr>
<td>Before education</td>
</tr>
<tr>
<td>after education</td>
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<tr>
<td>P-value</td>
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</table>

A: Researcher trained, B: Peer education , C: Control group, & P-value according to analysis of variance for the pre-intervention, $: P-value Based on the analysis of covariance and Sidak post hoc test for comparisons after the intervention for between groups and the paired t-test for within group comparisons
group the score raised significantly from 47.06 to 55.22 after interventions (P < 0.001). However, no significant difference was observed in the control group (P= 0.076).

Investigation of the plans to choose the method of delivery revealed that, before education, in the researcher trained group, 28.6% had a certain plan for vaginal delivery, and 7.7% had a certain plan for caesarean, that after education increased to 66% and decreased to 4% respectively (P < 0.001). In the peer education group, education increased the certain plan for vaginal birth from 33% to 57% and decreased the certain plan for caesarean from 16% to 3%, (P < 0.001). In the control group, these changes were not significant (P>0.05) (Table 3).

After the intervention, the study subjects were followed up to know what delivery methods they choose and what was their Delivery performances. The results are presented in the Table 4.
In this study both types of interventions almost equally involved in raising knowledge knowledge so that the difference between the two groups was not significant, but Dabiri et al. who have studied the effect of lectures and peer education on knowledge, attitude toward the menstrual hygiene, concluded that peer education have been more effective [39]. In other studies the similar results were found; In the study of Akbarzadeh et al [28], the students received breast self-exam education from health personnel compared with peer, and in the study done by Sehhati et al [40] that knowledge of students about iron supplementation has been investigated, peer education was more effective than health care staff.

It seems that similarity of the effect of these two educational methods is due to the mothers who look for the best health and this make considerable change in their knowledge and attitude with any educational method. It could be concluded that mothers are eager to get train and their education should be considered more important.

It should be noted that the score of knowledge in the control group also partially increased, which could be due to routine training in health care. Ghafari reported an increase in the knowledge score in the control group [38] and they concluded that, the main reason was the curiosity of pregnant women toward the questionnaire answers. However the increase in the, was not comparable to the increasing of knowledge in the intervention group.

About the intention toward choosing the delivery method, after intervention there was a significant difference between intervention and control groups. The similar findings were found by the study done by Ghaffari [38], Fathian [36] and Shahraki [24]. Sadat also reported an increase in the vaginal delivery intention and attitude toward the questionnaire answers. However the increase in the, was not comparable to the increasing of knowledge in the intervention group.

In this study the natural childbirth increased in researcher trianed group compared to the control group. But, changes in the peer education group were not significant hence the training by midwives has been more effective in the final selection compared to peer education group.

In the study done Kazemzadeh (2007) they reduced the caesaren rate among the women who had participated in the pregnancy

### Table 3. The relative frequency of responses of behavioral intention in pregnant women.

<table>
<thead>
<tr>
<th>Decision for the type of delivery</th>
<th>Before intervention (%)</th>
<th>After intervention (%)</th>
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<tbody>
<tr>
<td></td>
<td>A (n=91)</td>
<td>B (n=93)</td>
</tr>
<tr>
<td>Probably caesarean</td>
<td>16 (17.6)</td>
<td>12 (12.9)</td>
</tr>
<tr>
<td>Certainly caesarean</td>
<td>7 (7.7)</td>
<td>15 (16.1)</td>
</tr>
<tr>
<td>Probably vaginal</td>
<td>42 (46.2)</td>
<td>33 (35.5)</td>
</tr>
<tr>
<td>Certainly vaginal</td>
<td>26 (28.6)</td>
<td>33 (35.5)</td>
</tr>
<tr>
<td>Test result</td>
<td>P=0.303</td>
<td>$\chi^2 (6)=7.20$</td>
</tr>
</tbody>
</table>

A: Researcher trained, B: Peer education, C: Control group, Chi-square test based on the exact method.

For choosing Vaginal delivery, there were significant differences between A (75.8%) and C (60.4%) groups however the differences between A and B (72.0%) was not significant (P>0.05). Additionally assessing other practices including Vaginal delivery, C-section for medical reasons, Elective caesarean, there was no significant differences among groups (P>0.05).

### Table 4. Frequency of choosing the delivery methods at the end of the study.

<table>
<thead>
<tr>
<th>Delivery methods</th>
<th>Study groups</th>
<th>Test results</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A (n=91)</td>
<td>B (n=93)</td>
</tr>
<tr>
<td>Vaginal delivery</td>
<td>69</td>
<td>78.5%</td>
</tr>
<tr>
<td>C-section for medical reasons</td>
<td>19</td>
<td>20.9%</td>
</tr>
<tr>
<td>Elective caesarean</td>
<td>3</td>
<td>3.3%</td>
</tr>
<tr>
<td>Total</td>
<td>91</td>
<td>100%</td>
</tr>
</tbody>
</table>

A: Researcher trained, B: Peer education, C: Control group. In each row, different letters show significant differences among percentages (P<0.05). For vaginal delivery there was significant difference between A and C groups but all other differences were not significant (P>0.05). Results obtained based on Chi-Squared test using exact method.

### Discussion

Effective peer education approach is one of the effective behavioral change strategies that increases the power of thought and creativity [28]. Trained peer educators, can convey information effectively, and as an available model, they could be effective in population [28, 29]. This study evaluated the effect of peer education training vs health professionals education on the knowledge and attitude of women toward choosing their delivery method.

In this study, a significant difference was not found among groups in the terms of background variable like job, education, pregnancy history, and income in relation to choose of delivery methods, that was similar to the findings of other studies like Fathian et al [36], Amiri and et al [37], Rahmani Najarkolaei et al. [15]. While in other studies such as Ghafari and colleagues [38], Nourizadeh and colleagues [6], results showed a significant association between age and mother’s education towards the selection of delivery method. Also in the studies done by Movahedi et al [11], and Ghadimi et al. [10], women’s education, husband’s education, and social status and employment status were related to the selection of caesarean. It seems that lack of relationship between the mentioned variables in this study is due to sample in this study was since they were limited to nulliparous women, with almost identical age, education and knowledge knowledge.
preparation classes, were significantly lower than the control group [42]. In the study of Shahraki (2012, educational intervention lead to increase in vaginal delivery, and decrease in caesarean section rate in the intervention by 18 percent [16] But Dabiri (2009), reported that education have had no impact on performance and they concluded that the reason could be the short period of the study, and they claimed that to change the behavior, the habits should change, and it takes long periods of training time [39].

**Study limitations**

Since this study was conducted on pregnant mothers in Boukan city, the results can’t be generalized easily due to cultural and social issues. Also, pregnant women with a very good economic situation mostly received prenatal care in private hospitals in the provincial capital, so they could not be referred to in this study. It could be noted that precisely in achieving the ultimate performance of the participants, a change in governmental policy and health systems to reduce the caesarean section rate is highly recommended.

In summary the results of this study demons rate the effectiveness of an educational intervention by health care providers, to increase normal vaginal delivery and reduce the amount of elective caesarean additionally, education of health care providers were more effective on ultimate selection of delivery method.

**Acknowledgement**

This article is the result of a research project approved in Tabriz University of Medical Sciences, and we warmly appreciate the deputy of research. Also we appreciate all managers and staffs in the health centers of Boukan and all mothers participating in this study.

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