

# Influential Factors of Mother-Infant Skin-to-Skin Contact Based on the Precede-Proceed Model from the Perspective of Midwives in Torbat Heydariyeh Hospitals

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ARTICLE INFO	ABSTRACT
<p><i>Article type:</i> Original article</p>	<p><b>Background &amp; aim:</b> Skin-to-skin contact immediately after birth plays a pivotal role in proper breastfeeding and mother-infant interaction. Despite numerous benefits of mother-infant skin-to-skin contact, this health behavior is not performed by many midwives. This study aimed to evaluate the influential factors for mother-infant skin-to-skin contact based on the Precede-Proceed model from the perspective of midwives in Torbat Heydariyeh hospitals.</p> <p><b>Methods:</b> This cross-sectional study was conducted on 50 midwives working in hospitals of Torbat Heydariyeh, Iran in 2015. Demographic data of all participants were collected, and Mother-Newborn Skin-to-Skin Contact Questionnaire was also used based on the Precede-Proceed model. Data analysis was performed in SPSS V.16 using descriptive statistics, tables and graphs.</p> <p><b>Results:</b> In this study, 88.1% of the midwives had positive attitudes towards skin-to-skin contact, and 90.5% had high perceived self-efficacy in performing the procedure. Major obstacles against establishing proper skin-to-skin contact were neonatal diseases and maternal fatigue (83.3%) from the perspective of midwives. Moreover, 87.5% and 90.5% of the midwives emphasized the pivotal role of social support and motivation, respectively in implementing skin-to-skin contact. Also, more than 90% of the midwives considered training programs, service access and adequate facilities to be influential in the proper establishment of skin-to-skin contact.</p> <p><b>Conclusion:</b> According to the results of this study, the majority of midwives believed that enabling and reinforcing factors had significant effects on the proper establishment of mother-infant skin-to-skin contact. Therefore, it is recommended that educational interventions be planned for parents, their family members and health care personnel involved in processes of childbirth and infant care. Furthermore, organizational planning and executive procedures should be developed to study the structures and barriers associated with skin-to-skin contact.</p>
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## Introduction

The first hours of life are the ideal time for establishing the primary interactions between the parents and neonate (1). Skin-to-skin contact, which occurs within the first hours after birth, prepares both the mother and neonate for a bilateral interaction (2). Furthermore, this method increases the ability of the mother in infant care enhancing her self-confidence and sense of attachment (3).

Mother-infant skin-to-skin contact was first

proposed by Rey and Martinez 30 years ago in Bogotá (Colombia) as a technique to compensate for lack of national resources in hospitals providing care for neonates with low birth weight (4-6). This method was first implemented in South America, Europe and the United States; ever since, it has been used to rectify the complications in infants kept in incubators in developing countries (7, 8). For skin-to-skin contact, the naked belly of the

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infant is placed on the skin between the mother's breasts within the first minutes after birth (9).

According to the literature, skin-to-skin contact increases the body temperature of infants more effectively compared to an incubator. Moreover, it improves the respiration and restful sleep of neonates (5). Skin-to-skin contact is also associated with the reduction of neonatal mortality rate, pain, anxiety, infections and length of hospital stay, as well as increased maternal satisfaction, longer breastfeeding, and better emotional communication between the mother and infant (10-17).

Skin-to-skin contact not only regulates the autonomic nervous system and psychological complications in neonates, but it also positively affects the psychological state of the mother and infant in the future (18-20). The fourth step of the Baby-Friendly Hospital Initiative emphasizes the importance of skin-to-skin contact between the mother and infant immediately after birth, as well as the initiation of breastfeeding within the first hour of birth. However, mother-infant skin-to-skin contact is not yet performed appropriately in our country (21). In addition to promoting of breastfeeding, midwives are expected to support mothers in establishing skin-to-skin contact with the infant immediately after birth (22, 23).

Midwifery is a key profession in the promotion of family and community health. As we know, midwives play a major role in the process of childbirth. According to statistics, 54.45% of deliveries (48.6% in urban areas, 64.32% in rural areas) are carried out by midwives, and these health care professionals are the first ones to make contact with infants after birth. However, evidence suggests that despite the emphasis of the Ministry of Health on the implementation of mother-infant skin-to-skin contact immediately after birth, the majority of midwives refuse to perform this health behavior (21).

In one study, Nahidi et al. (2013) reported that the majority of midwives had adequate knowledge and favorable attitude towards the importance of skin-to-skin contact (24), while in another study, the same author stated that 90% of midwives refused to implement mother-infant skin-to-skin contact immediately after

birth (21). Therefore, recognition of the obstacles against the establishment of skin-to-skin contact upon birth is of paramount importance. In this regard, behavioral analysis based on standard models often leads to an extensive understanding of the related influential factors. Available theories and models provide specific processes for the analysis of success or failure in performing medical procedures (25).

The Precede-Proceed model is a highly recommended pattern, which was later promoted to the Precede-Proceed model. This model is widely used to determine the behavioral factors involved in health care procedures (26). The Precede-Proceed model provides a framework in which behavioral risk factors, reinforcing factors, and enabling factors are evaluated separately (27).

In general, predisposing factors are defined as the parameters that form basic behavioral motivations. Such examples are information, attitude, beliefs, values, culture, customs and traditions, and some demographic features, which facilitate or inhibit a certain behavior.

Enabling factors facilitate or inhibit environmental and behavioral changes that affect the behaviors of an individual. Some of the parameters in relation to enabling factors are laws, health care plans, professional skills, and access to medical services and necessary resources.

Reinforcing factors are defined as the feedback received from others following a certain behavioral compatibility, which could promote or undermine the continuity of a behavior. Reinforcing factors include social support, peer groups, family members, individual abilities, health care providers, leaders, and respectable people for an individual (21, 25, 28). Identification and modification of these factors in educational programs could significantly influence the change or development of a behavior.

In medical training programs, the aforementioned factors should be considered and prioritized in order to focus on the effectiveness of each item during the early stages of an intervention. Predisposing, enabling and reinforcing factors could affect the behavior of midwives in establishing mother-infant skin-

to-skin contact upon birth. For instance, in the study by Nahidi et al. (2014), the majority of midwives working in the hospitals of Tehran city (Iran) were aware of the key role of factors such as adequate equipment, human resources, and structured programs in the proper implementation of mother-infant skin-to-skin contact (29).

To date, few studies have been performed to evaluate the role of predisposing, reinforcing and enabling factors in the establishment of mother-infant skin-to-skin contact. Considering the differences in the individual, organizational and environmental conditions of the Iranian hospitals and medical centers, this study aimed to determine the influential factors for the proper implementation of mother-infant skin-to-skin contact immediately after birth based on the Precede-Proceed model from the perspective of the midwives in Torbat Heydariyeh hospitals..

## Materials and Methods

This descriptive cross-sectional study was conducted on 50 midwives working in the hospitals of Torbat Heydariyeh city, Iran in 2015. Due to the limitations of the study population, census sampling was performed on the midwives engaged in the maternity wards of 9<sup>th</sup>. Dey and Razi hospitals affiliated to the Social Security Office of Torbat Heydariyeh city. Participants with informed consent were enrolled in the study, and those with incomplete questionnaires were excluded from the study.

Demographic data of the participants were collected, and the Mother-Newborn Skin-To-Skin Contact Questionnaire was also completed by the midwives. Demographic data were age, gender, marital status, employment status, work experience, interest in midwifery, job satisfaction, parity, gravidity, and training experience on skin-to-skin contact upon birth. Moreover, the demographic questionnaire included one open-ended question to assess the technique the midwives used to place the infant on the mother for skin-to-skin contact.

Mother-Newborn Skin-To-Skin Contact Questionnaire consisted of 53 items, which were scored based on a three-point Likert scale (Disagree=0, Do Not Know=1, Agree=2). This questionnaire has been extracted from

three articles published by Nahidi and Tavafian. This scale evaluates the influential factors for skin-to-skin contact behavior in three areas of predisposing, enabling and reinforcing factors. Predisposing factors are divided into three subscales of attitude (11 items), barriers against performing skin-to-skin contact (five items), and perceived self-efficacy regarding the establishment of skin-to-skin contact (seven items) (21).

In Mother-Newborn Skin-To-Skin Contact Questionnaire, enabling factors include two subscales of social support (10 items) and motivation (seven items) in performing skin-to-skin contact (30). Social support is evaluated through the following parameters: 1) support from medical team members (e.g., obstetricians, anesthesiologists, pediatricians, colleagues, and hospital authorities) and 2) support and confidence of the parturient, her husband and family members in implementing skin-to-skin contact. As for motivation, it is evaluated through factors such as the knowledge of midwives and their willingness to establish skin-to-skin contact, maternal knowledge and satisfaction, and comfort of the mother and infant during skin-to-skin contact.

With respect to reinforcing factors, three subscales were evaluated, as follows: 1) structured programs for implementing skin-to-skin contact (two items), 2) provision of medical services for the mother (seven items) and 3) available facilities and equipment (four items) (29).

Answers on all the subscales were scored based on a three-point Likert scale (Disagree=0, Do Not Know=1, Agree=2). Considering the different score range of the subscales, the score for each subscale was calculated out of 100. Scores were defined as low (0-33.33%), moderate (33.34-66.66%), and high (66.67-100%).

Moreover, the subscale of attitude was divided into three levels of negative, neutral, and positive, and perceived self-efficacy was divided into three levels of poor, moderate, and high.

Content validity of each questionnaire was confirmed using a qualitative approach by a panel of experts, and reliability was determined using Cronbach's alpha coefficient of >0.7 for all

the subscales.

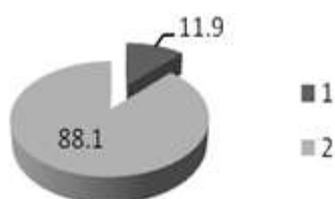
The study protocol was approved by the Ethics Committee of Torbat Heydariyeh University of Medical Sciences. Objectives of the study were explained to the participants, and informed consent was obtained from all the midwives prior to the study.

For data collection, the questionnaires were completed by the participants half an hour before their working shifts at the maternity wards of the selected hospitals without researcher supervision within 20 minutes. The researchers would clarify any ambiguity in case the participants had any questions about the data collection tools. Data analysis was performed in SPSS V.21 using descriptive statistics, tables and graphs.

## Results

In total, 43 midwives completed the questionnaires in this study. Mean age of the participants was  $30.97 \pm 6.83$  years (age range: 23-56 years), and mean of work experience was  $5.25 \pm 2.03$  years (range: 5 months-26 years). Mean scores of interest in midwifery profession and job satisfaction were  $6.73 \pm 2.76$  and  $5.69 \pm 2.67$ , respectively (score range: 0-10).

Regarding the establishment of mother-infant skin-to-skin contact, 87.71% of the participants stated that they often placed the infant indirectly on the abdomen of the mother immediately after birth using sterile drapes, and only 11% of the midwives performed skin-to-skin contact properly. In other cases, the infant would stay attached to a warmer system with no skin-to-skin contact after exit from the birth canal by the midwife or other personnel responsible for providing the appropriate condition for breastfeeding.



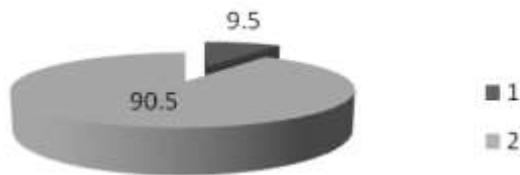
**Figure 1.** Attitude of Midwives towards Skin-to-Skin Contact Benefits

Mean score of perceived self-efficacy in implementing skin-to-skin contact was

$89.45 \pm 15.79$ . In this regard, 90.5% and 9.5% of the midwives had high and moderate self-efficacy in performing skin-to-skin contact, respectively (Figure 2).

**Table 1.** Demographic Characteristics of Studied Midwives

Variables	N (%)
<b>Marital Status</b>	
Single	7 (17.5%)
Married	23 (57.5%)
<b>Midwifery Education Level</b>	
Associate's Degree	1 (4.2%)
Bachelor's Degree	41 (97.96%)
Master's Degree	2 (4.8%)
<b>Employment Status</b>	
Official	30 (71.42%)
Contractual	1 (2.38%)
By Project	11 (26.19%)
<b>Pregnancy Experience</b>	
Yes	16 (38.9%)
No	26 (61.90%)
<b>Childbirth Experience</b>	
Yes	16 (38.9%)
No	26 (61.90%)
<b>Training Experience in Skin-to-Skin Contact</b>	
Yes	11 (26.2%)
No	31 (73.8%)
<b>Interest in Midwifery Profession</b>	
Low	5 (11.9%)
Moderate	8 (19.0%)
High	29 (69.0%)
<b>Job Satisfaction</b>	
Low	8 (19.0%)
Medium	17 (40.5%)
High	17 (40.5%)
<b>Performance of Skin-to-Skin Contact</b>	
Rarely	18 (42.9%)
Sometimes	16 (38.1%)
Often	4 (9.5%)
Always	4 (9.5%)



**Figure 2.** Level of Perceived Self-efficacy in Implementing Skin-to-Skin Contact

Evaluation of the views of the midwives regarding the influential factors for skin-to-skin contact indicated that 88.1% and 11.9% of the participants had positive and neutral attitudes towards the mental and physical benefits of skin-to-skin contact, respectively (Figure 1).

According to the information in Table 2, the majority of our participants believed that factors such as neonatal and maternal diseases, cesarean delivery, infant care after cesarean section, and maternal fatigue were major obstacles against the implementation of skin-to-skin contact.

In this study, viewpoints of the midwives regarding the reinforcing factors for the implementation of skin-to-skin contact were investigated in two categories of social support and motivation. According to the information in Figure 3, 90.5% of the midwives claimed that the social support provided by the treatment team, hospital administration, and the parturient and her family members played a pivotal role in the proper establishment of

skin-to-skin contact. In this regard, 9.5% of the participants stated that social support had a moderate role in performing skin-to-skin contact. In addition, 87.5% of the midwives believed that motivation was an essential element in the appropriate implementation of skin-to-skin contact.

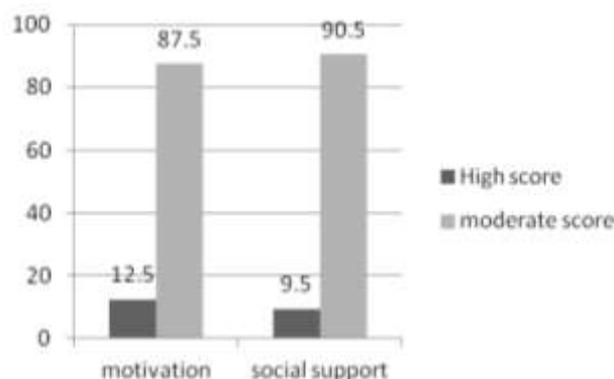
In this study, we also evaluated the opinions of midwives about the effect of enabling factors on the establishment of skin-to-skin contact. According to the results, 92.2% of the participants emphasized the pivotal role of large-scale training programs, 91.9% highlighted the importance of available services, and 90% pointed out the significance of adequate equipment for implementing skin-to-skin contact (Figure 4). None of the participants considered the role of the aforementioned variables to be insignificant.

## Discussion

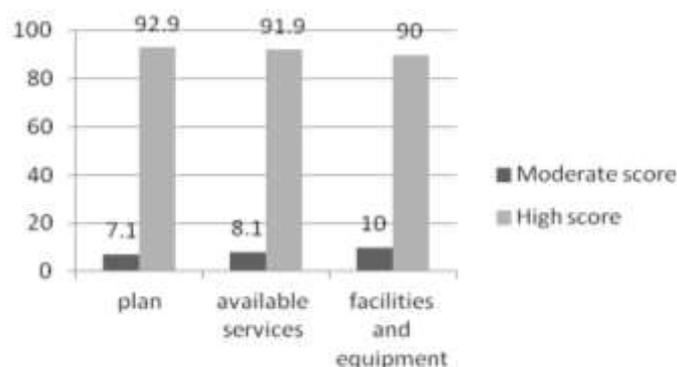
Despite its numerous benefits, only a small percentage of midwives in the maternity wards of Torbat Heydariyeh hospitals performed mother-infant skin-to-skin contact immediately after birth, and the majority of these midwives only indirectly placed the infant on the abdomen of the mother using sterile drapes. Similarly, the findings of Vakilian et al. indicated that although skin-to-skin contact was performed in most hospitals, insufficient attention was paid to the quality and duration of this intervention (31).

**Table 2.** Opinions of Midwives about Obstacles against Performing Skin-to-Skin Contact Based on Predisposing Factors

Item	Disagree (%)	Do Not Know (%)	Agree (%)
Poor condition of infants hinders skin-to-skin contact.	4.8	11.9	83.3
Skin-to-skin contact is not feasible for ill mothers.	9.5	21.4	69.0
Complications of C-section adversely affect skin-to-skin contact.	4.8	26.2	69.0
Complications in infants born via C-section affect skin-to-skin contact.	9.5	21.4	69.0
Maternal fatigue caused by non-standard interventions during labor affects skin-to-skin contact.	2.4	14.3	83.3



**Figure 3.** Distribution of Participants Based on Opinions Regarding the Effect of Reinforcing Factors on Skin-to-Skin Contact (High Scores=66.67-100, Medium Scores=33.3-66.66, Low Scores=<33.32)



**Figure 4.** Distribution of Participants Based on Opinions Regarding the Effect of Enabling Factors on Skin-to-Skin Contact (High Scores=66.67-100, Medium Scores=33.3-66.66, Low Scores=<33.32)

According to the results of the present study, predisposing factors had a more significant role in the proper establishment of skin-to-skin contact in the viewpoint of midwives compared to motivation and behavior changes (21, 28).

In the current study, the majority of the midwives had positive attitudes towards skin-to-skin contact upon birth, which is one of the main predisposing factors in the Precede-Proceed model. In fact, most of our participants believed that mother-infant skin-to-skin contact was a necessary health behavior to improve the physical and mental health of the mother and newborn. In this regard, the results obtained by Nahidi et al. (2013) also indicated that most of the midwives working in hospitals of Tehran city (Iran) had positive attitudes toward skin-to-skin contact (24). Similarly, Chia et al. (2006) denoted the positive attitudes of intensive care unit nurses towards the implementation of skin-to-skin contact immediately after birth (32).

Attitude signifies the inclination of an individual towards a certain behavior. Evidently, different health care personnel share the same opinion on the pivotal role of skin-to-skin contact in promoting the health of both the mother and infant. According to the literature, attitude is one of the main determinants of behavior; however, it is also of paramount importance for health care professionals to have confidence in their performance. In the present study, mean scores of perceived self-efficacy in establishing skin-to-skin contact were relatively high among the participants.

In this regard, Bandura has claimed that the opinion of an individual towards their potential and abilities positively affects their actions and is the most important determinant of their behaviors (33). Few studies have evaluated the self-efficacy of health care providers in implementing skin-to-skin contact. For instance, in a qualitative study, Nahidi et al. (2015) stated

that perceived self-efficacy was a significant factor in the appropriate implementation of skin-to-skin contact in the viewpoint of midwives (21). Therefore, it seems that the participants in the present study had favorable opinions regarding this predisposing factor.

Considering the positive attitude, high level of perceived self-efficacy, and barriers against the implementation of skin-to-skin contact in the midwives of Torbat Heydariyeh hospitals, other possible factors influencing this behavior should be further investigated.

Another parameter evaluated in terms of predisposing factors for skin-to-skin contact was the opinion of the midwives about the barriers against the establishment of this health behavior. The majority of our participants believed that factors such as neonatal and maternal diseases, cesarean delivery, infant care after cesarean section, and maternal fatigue were the main obstacles against performing skin-to-skin contact. Among these factors, maternal fatigue and neonatal diseases were reported as the most significant challenges against skin-to-skin contact.

In one study by Ferrario and Hatfield (2014), maternal confusion was reported to be one of the four main obstacles against implementing skin-to-skin contact after birth from the perspective of nurses in the hospitals of Pennsylvania, Philadelphia (U.S.A) (34). Similarly, findings of Zwedberg et al. (2014) indicated that the physical and mental state of the mother was a major influential factor for skin-to-skin contact in the viewpoint of midwives in hospitals of Stockholm, Sweden (35). In addition, Mangan et al. (2012) claimed that cesarean delivery and neonatal diseases were the main obstacles against performing skin-to-skin contact. Furthermore, they concluded that an interactive approach between delivery team members and appropriate infant care could make skin-to-skin contact an essential part of the routine medical performance in operating rooms and neonatal intensive care units (36). Correspondingly, if the mother is in poor overall condition due to factors such as fatigue or use of anesthetic drugs, support from a family member or health care provider during skin-to-skin contact could

remarkably improve her physical and mental condition.

In the present study, reinforcing factors for skin-to-skin contact were evaluated in two subscales of social support and motivation. Social support was defined as the reactions of important individuals to the behavior of a person. According to our findings, the majority of midwives emphasized the significant effect of social support on the proper establishment of skin-to-skin contact immediately after birth. In other words, support of patient companions and family members could effectively facilitate the implementation of skin-to-skin contact. Similarly, Venus et al. (2013) reported that 93.8% of the midwives in private hospitals of Tehran (Iran) confirmed the pivotal role of social support in the successful implementation of mother-infant skin-to-skin contact (30).

In a qualitative study by Swedberg et al. (2014), lack of cooperation by other medical personnel was reported as a major obstacle against performing skin-to-skin contact in the viewpoint of midwives. Moreover, it was stated that many medical professionals had poor knowledge of the benefits of this health behavior (35).

According to the findings of Berg (1996) and Zwedberg (2010), self-confidence and trust of mothers in midwives were reported to have a significant effect on the proper implementation of skin-to-skin contact (35, 37). Correspondingly, training of other health care providers (e.g., gynecologists and pediatricians) and family members of mothers could remarkably improve the process of skin-to-skin contact after delivery.

According to the results of the present study, motivation was a significant factor involved in the proper establishment of skin-to-skin contact in the viewpoint of midwives. In this context, factors such as the knowledge and willingness of the midwife, knowledge and satisfaction of the mother, and comfort of the mother and infant during skin-to-skin contact could remarkably affect the internal motivation of midwives to carry out this intervention.

In the study by Ferrarello (2014), most of the midwives believed that mothers commonly have inadequate knowledge of the importance of skin-to-skin contact, and this was considered as

a major obstacle against performing this intervention (34). Similarly, findings of Zwedberg (2013) indicated that lack of adequate knowledge in some parents was a notable barrier against skin-to-skin contact after cesarean section from the perspective of midwives. In such cases, it is rather difficult to encourage skin-to-skin contact in mothers (35). Therefore, training of pregnant women on the advantages of skin-to-skin contact after delivery seems to be of paramount importance.

With respect to the enabling factors for skin-to-skin contact, the findings of the present study indicated that supporting programs of the Ministry of Health play a pivotal role in the proper establishment of mother-infant skin-to-skin contact. Similarly, Nahidi et al. reported that 90.4% of midwives acknowledged the significance of an inclusive program in performing skin-to-skin contact effectively (29).

In one study by Higman et al. (2015), lack of guidelines and formal education were reported as the main obstacles against skin-to-skin contact in the viewpoint of the nurses of intensive care units (38). Therefore, related hospital protocols should be modified in order to enhance the quality of mother-infant skin-to-skin contact. For instance, measures such as regular neonatal examinations, evaluation of anthropometric indices, and drug therapy at the second hour of birth should be taken into account.

Availability of health care services is considered as one of the main parameters of the enabling structure in establishing skin-to-skin contact. In the present study, 91.9% of the midwives emphasized the key role of factors such as training of the mother or both parents before and during delivery, training of family members, use of analgesic techniques, encouraging of the mother for skin-to-skin contact, and team collaboration in the proper implementation of this intervention. In this regard, the results obtained by Nahidi et al. also highlighted the role of service availability in performing skin-to-skin contact between the mother and infant (29).

Facilities and equipment were another subscale associated with the enabling factors for skin-to-skin contact. Similar to the study by Nahidi et al., the majority of the midwives in the

current study considered factors such as sufficient human resources, presence of trained health care providers in the delivery room, adequate operating room space, optimum temperature, and suitable maternity beds to have significant effects on the successful establishment of skin-to-skin contact (29). In the qualitative study by Zwedberg et al. (2013), lack of space and organizational barriers were reported as the main obstacles against skin-to-skin contact after cesarean section in the viewpoint of midwives (35). Similarly, findings of Higman et al. (2015) indicated that inadequate trained personnel and lack of registered protocols were the major barriers against skin-to-skin contact from the perspective of nurses in neonatal intensive care units (38).

One of the limitations of the present study was the small sample size, which is justified considering the restricted study population. Furthermore, due to different organizational and environmental factors prevailing in various health centers, the results of the current study could not be generalized. Therefore, it is recommended that future studies be conducted as to validate these findings in other clinical settings.

Since only a few midwives performed skin-to-skin contact properly, the relationship between the Precede-Proceed model structures and behavior could not be evaluated accurately. Moreover, the prognostic value of each structure could not be determined, and we only assessed the opinions of midwives in this regard. Therefore, it is recommended that future studies be conducted on this subject in other medical centers of the country.

## Conclusion

According to the results of this study, awareness of parents regarding the importance of mother-infant skin-to-skin contact should be raised through training programs during pregnancy and childbirth. In this regard, prenatal training sessions could remarkably inform parents of the benefits of skin-to-skin contact. On the other hand, numerous advantages of skin-to-skin contact should encourage health care planners to design specific guidelines and training programs in

hospitals for midwives and other medical staff. In addition to information regarding the benefits of skin-to-skin contact upon birth, these guidelines should provide written, structured protocols on the implementation, optimum time, and duration of this procedure. As a necessary health behavior, mother-infant skin-to-skin contact should be improved with sufficient facilities, equipment, and experienced personnel. This requires the special attention of health care planners and managers of the country.

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### Conflicts of Interest

The authors declare no conflicts of interest.

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