Investigating the relationship between theory of planned behavior construct with the pregnant women intention about neonatal care

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Abstract

Background: Considering that neonatal are the most sensitive group to kind of diseases, the present study aimed an investigating the relationship between theory of planned behavior construct with the pregnant women intention about neonatal care.

Method: In this cross-sectional study, 100 pregnant women in trimester of pregnancy were selected by random sampling. Data was collected using valid and reliable questionnaire and interviews conducted with pregnant women. The questionnaire included demographic characteristic of the mothers and theory planned behavior construct. Finally the data were analyzed by SPSS 20 T-test, Chi-square, Correlation, ANOVA and regression.

Results: The average age of the sample was 26.12±4.9 and the average duration of marriage age was 3.9 ±2.74 years. There was a high correlation between perceived behavioral control and behavioral intention ($r=0.40$; $p < 0.001$). Over 40% of pregnant women were shown to lack overall Knowledge about the items related to neonatal care. The mothers who were better prepared for parenting tended to have a higher level of schooling, perceived control behavior and knowledge. Regression analysis showed that the knowledge and perceived behavior control R^2 =32% in the prediction of neonatal care intentions.

Conclusions: Findings of this study show support for the predictive ability of the theory of planned behavior in predicting for neonatal care therefore the design of educational intervention should be based on intention and knowledge as the most important predictors of maternal behavior.

Background

The United Nations' Sustainable Development Goals (SDGs) include reducing the global maternal mortality rate to less than 70 per 100,000 live births and ending preventable deaths of newborns and children under five years of age, in every country, by 2030. Neonatal death audit and review is widely recommended as an intervention to reduce neonatal morbidity, mortality and to improve quality of care, and could be key to attaining the SDGs. For pregnant mothers, having a child requires the incorporation of new knowledge and performance to develop proficiency in neonatal and child-care [1].

In fact to save the life of neonates, the based on recommended WHO essential newborn care performance are crucial interventions; in all aspect in neonatal care, mainly care for the low birth weight newborn [2]. Based on UNICEF the medium world-wide rate of 18 deaths per 1000 live births in 2017 that majority appear period the first week [3]. Whereas infantile mortality rate in Iran 13 deaths per 1000 live births [4–5].

With considering that in the human life cycle the early childhood phase and neonatal period is the most important phase for every human being [6–7] therefor the well-being of children and neonatal depends on the ability of families especially mothers to function effectively. It is important that the capacity of mothers be strengthened and supported to give their children the best possible start in life [8]. For improve the quality of care provided to children it is necessary that identify obstacle to accessing maternal health services and enhance advocate for mothers before and after birth for child health [9]. Deficiency of women awareness, attitude and performance perhaps influence mothers to minimization their child’s needs (for example lack seeking information about side effect self-medication in newborn and children) [10].

For example in studies in Mongolia revealed that parents gave medications to their children without a prescription for different reasons [11]. Also, the result of other studies showed that some parents give drugs to their children to treat an inflammatory bowel disease without consulting a doctor [12]. In another counteries for example in Kenia only 28%, in Ethiopia 18.2% and Himalayas 52% of women had adequate knowledge about neonatal care [13–15].

In this study, the Theory of Planned Behavior (TPB) has been used. This theory has been used in many studies of health behaviors such as urinary tract infection in children [16] and during pregnancy [17]. TPB is applied to determine and understand the effect of environmental and individual factors on a behavior. Since the theory measures both direct behavior and intention (they are closely related to each other), through improving the intention the mothers about neonatal care [10].

The levels of pregnant women's knowledge, attitude, construct TPB and performance towards their neonatal care have been previously neither analyzed nor reported in relation to TPB in IRAN. Therefore the aim of this study was determine the relationship between theory of TPB construct with the pregnant women intention about neonatal care.

This study to respond the following questions: what is the level of knowledge, construct of TPB and intention of pregnant women regarding the neonatal care? What is the association between intention construct of TPB and neonatal care? What power predictive construct of TPB for neonatal care in pregnant women? What is the association between mothers' knowledge, attitude, intention and socioeconomic status factors, such as maternal attitudes about neonatal care, level of education, have been found to be better predictors of neonatal care compared to socio-demographic factors?.

Methods

Study Design

This is a cross-sectional and analytical study that was carried out on 100 pregnant women referring to health centers in Arak (A city in Iran IR) in 2019.

According to the study by Ghasemi et al. [18] and to enable provincially representative proportions to be estimated, the sample size was calculated with α (error) = 0.05, 1-β (power) = 0.90 and *d* (precision) = 0.1

samples was estimated 100 pregnant women were determined to be the final sample size estimates. Samples were selected by convenience sampling from pregnant mothers who had gone to four health centers in Arak city. A total of 100 pregnant women selected using convenience sampling based on the following inclusion criteria: (1) being a mother - pregnant in trimester of pregnancy and (2) Nulliparous women and (3) Desiring to participate in the study. Exclusion criteria included having no desire to participate in the study.

In this study, the dependent variable was intentional behavior and demographic variables and other construct TPB were independent variables.

The pregnant women were initially approached by health worker in the health centers and invited to participate in the study. All those who were approached agreed to participate. The study objectives and procedures were explained, confirming the voluntary nature of participation and the participants' right to withdraw from the study at any time.

Measures

The data collection is a reliable and validity researcher made questionnaire and interview conducted by the researcher. The questionnaire was structured in six parts as follows:
1-Socio-economic variables: including mother's age, marriage age, level education mothers and husband, job mother and husband, and so on.
2-general knowledge about neonatal care: consist of 8 items was based on three or four choices questions. For example, "what time the first baby visit after birth?". In the awareness questions section, for each correct answer, a score of 1 and for each false answer, a score of 0 was considered, and range of scores was from zero to one.
3- Attitude of pregnant women about neonatal care consist of 4items were scored according to the Likert's five scales: from completely disagree (score 1) to completely agree (score 5) and the range of scores was between 1and 5.
4- Subjective norm of pregnant women about neonatal care was assessed using 6 items with 5-point Likert scale were designed and the range of scores was between 1 and 5. For example, "Health worker or husband encourages me to awareness about neonatal care in my child."
5- Perceived behavioral control in neonatal care: consist of 6 items and the range of scores was between 1 and 5.
6- Behavioral intention in neonatal care was assessed using 3 items and the range of scores was between 1 and 5.
All items were scored on a 5-point Likert scale ranging from 1 = totally disagree to 5 = totally agree.
To make the results comparable with other scales, in construct of TPB we transformed scores from 1 to 5. In our study, the minimum possible score for each question in construct of TPB was one and range of scores was five (1 to 5). The total scores for each subscale were calculated by averaging the scores of all questions on that scale, ranging from 1 to 5. To obtain the score of each dimension, the mean scores of all items in that dimension was obtained.
One of the potential sources of bias in this study, neonatal care which was self-reported. Based on valid resource [16, 19] when researcher due to some problems in obtaining data with direct observation using the self-report method an accepted.
In this study the questionnaire validity was assessed with using content validity method includes content validity ratio (CVR) and content validity index (CVI) was approved 0.62 and 0.79 respectively. Moreover in the qualitative face validity, participants expressed no problems with reading and understanding the items. Reliability was calculated with internal consistency method based on Chronbach's alpha on pregnant women. In this study, Cronbach's alpha was upper 0.7 in subscale questionnaire.

Statistical methods

The data were analyzed through the SPSS, Vs 20 (Chicago, IL, USA). with descriptive statistics (Mean, Standard deviation and percent), analytical statistics (Pearson correlation, regression logistic). The data had a normal distribution (correction of the Kolmogorov-Smirnov test by Lilliefors).

Ethical Considerations

All the procedures performed in the study involving human participants, were in accordance with the ethical standards. The present study was approved by the Research Council of Arak University of Medical Sciences (Grant Number:2957). Ethics committee approval code number is (IR.ARAKMU.REC. 1397. 169). Moreover informed written consent was obtained from the mothers.

Results

A total of 100 pregnant women participated in the study. The average age of the sample was 26.12 years. Of these, 100 pregnant women responded to the interviewer-administered questionnaire 40% were between the age of 24 and 28 years. 35% of the women had completed higher education and 44% had completed secondary education. The average duration of marriage age was 3.9 years.

Tables 1 and 2 presents the characteristics (qualitative and quantitative variables) of pregnant women interviewed in the survey.

Table 1
Demographic quantitative characteristics of pregnant mothers (n = 100)

Variables	Mean	Std. Deviation	Minimum	Maximum
Age (years)	26.12	4.9	16	39
Height (Cm)	163.64	6.02	150	176
Weight (Kg)	70.50	11.9	45	99
BMI (weight (Kg)/Height (m^2)	26.29	4.08	17.15	37.26
delivery	5.58	.997	4	9
Marriage age (years)	3.97	2.749	1	15

Table 2
Demographic qualitative characteristics of pregnant mothers (n = 100)

Variables		N and %
Age groups (years)	<=23	32
	24–28	40
	>=29	28
Level of education mothers	primary school	3
	Secondary school	18
	High school	44
	Academic education	35
Level of education husband	primary school	2
	Secondary school	24
	High school	45
	Academic education	29
Job mother	Housewife	88
	Employee	12
Job husband	Employee	22
	Manual employed	17
	Unemployed	61

The highest score was obtained for the construct of intention behavior 4.40, while the lowest scores were obtained for the attitude 3.48. Table 3 presents the Knowledge, construct of TPB and intention behavior of pregnant women about neonatal care (Table 3).

In a study about pregnant women intention to neonatal care indicate that the women positive attitudes towards breastfeeding, temperature and bathing. This study imply that it is important to assess women's intentions behavior in order to choose strategic approaches for increasing intention in neonatal care.

There was a high correlation between perceived behavioral control and behavioral intention ($r = 0.40$; $p < 0.001$). Table 4 shows that the correlation between pregnant mothers intention behavior and neonatal care based on TPB. (Table 4).

Table 3
The mean score of the constructs of TPB regarding neonatal care in pregnant women

Variables	Mean	Std. Deviation	Minimum	Maximum
Knowledge	.5825	.23	.00	1.00
Attitude	3.48	.367	2.80	4.00
Subjective norm	3.47	.49	2.50	5.00
Perceived behavior control	3.67	.44	2.83	4.67
Intention behavior	4.40	.44	3.67	5.00

Table 4
Correlation between pregnant mothers intention behavior and neonatal care based on TPB

Variables		age	Marriage age	Knowledge	Attitude	Subjective norm	Perceived behavior control	Intention behavior
age	Pearson Correlation	1						
	P valu							
Marriage age	Pearson Correlation	.381**	1					
	P valu	.000						
Knowledge	Pearson Correlation	.060	.052	1				
	P valu	.554	.608					
Attitude	Pearson Correlation	.061	.068	.493**	1			
	P valu	.547	.498	.000				
Subjective norm	Pearson Correlation	.046	.054	.131	− .003	1		
	P valu	.653	.591	.192	.975			
Perceived behavior control	Pearson Correlation	− .017	− .073	.011	.117	.058	1	
	P valu	.870	.467	.914	.246	.567		
Intention behavior	Pearson Correlation	.039	− .117	.089	.012	.075	.409**	1
	P valu	.699	.245	.381	.908	.457	.000	
**. Correlation is significant at the 0.01 level								
*. Correlation is significant at the 0.05 level								

In this study regression analysis showed that the predictive knowledge and perceived control behavior for the intention behavior for neonatal care was 32%. (Table 5).

Table 5
Regression analysis of predictive construct of TPB for the intention behavior of pregnant mothers in neonatal care

Model		Model Summary			Coefficients				
R	R Square	Adjusted R Square	Unstandardized Coefficients		Standardized Coefficients	t	Sig.		
			B	Std. Error	Beta				
1	Knowledge	.506[a]	0.256	0.248	.438	.075	.506	5.803	.000
2	Perceived behavior control and knowledge	.584[b]	0.341	0.327	.460	.072	.532	6.424	.000
Dependent Variable: Intention behavior of pregnant mother in neonatal care									
a. Predictors: (Constant), Knowledge									
b. Predictors: (Constant), perceived behavior control and knowledge									

The results show that the mothers deficiency knowledge for majority dimension. Over 40% of pregnant women were shown to deficiency total Knowledge about the dimension associated to neonatal care, 59% did not know when the visit babies in the first days after birth for the good time for identification of hereditary abnormal should be carry out, 22% did not know what should be the first the baby's milking? 73% did not know appropriate baby's room temperature, and 47% were unaware of the take care of the baby's cord.

60% of mothers deficiency Knowledge about the how to bath and cleaning a baby, 22% concerning evidence that acquit desire healthcare services. Furthermore, 33% of the mothers deficiency Knowledge about physiological jaundice infants. A little over 26% of mothers deficiency Knowledge about the advantage of beginning milk or colostrom. Table 6 shows that the knowledge scores for each assessment items. (Table 6).

Table 6
The frequency of knowledge scores for each assessment items about neonatal care in pregnant women

Variables	Know	Don't Know
The first baby visit after birth	41	59
Baby room temperature	27	73
Baby cord care	53	47
Bathing the baby	40	60
Breastfeeding (colostrum)	74	26
Knowing the Benefits of Breastfeeding	86	14
Recognizing danger sign in neonatal	78	22
Neonatal jaundice	67	33

To identify the essential or crucial distinguishing of mothers who are enhance prepared for parenting, we analyzed the association between level of knowledge, attitude, intention behavior and the attribute variables such as higher

level of education mothers and husband, live with child father, intention to breastfeeding, health worker and midwife as information source to visit in health centers.

Discussion

TPB is considered as a useful model to predict human behavior and widely used in areas of health [16–19]. In this study the proportion of pregnant women who correctly know about neonatal care showed that knowledge were lacking for some items. Therefore the efforts should be made to increase it, and health workers in health centers should play a leading role.

Similarly in a study in Nepal participants had a moderate level of knowledge on newborn care (56%), and among its four components, participants had lowest knowledge in breastfeeding (44%) and adequate knowledge (78%) of immunization. Maternal education and socioeconomic status had a significant, positive association with newborn-care knowledge [20]. In another study in Kenia 28%, Ethiopia 18.2% and in Himalayas 52% of women had adequate knowledge about neonatal care [13–15]. The results of this study are consistent with our study.

Therefore the health educator and midwife in health centers should be provided for women regarding an importance knowledge and improve women's motivation for neonatal care.

A systematic review of 30 studies by Schaaf et al. indicated that low socioeconomic status have a significant influence on neonatal care and increased risk of preterm birth [21]. Some causative factors on neonatal care includes deficiency of knowledge, poverty, adverse environmental conditions, access to quality health care, maternal health behaviors such as smoking or illicit drug use, and maternal stress [22].

In this study finding showed that correlation between mothers' knowledge, intention behavior, age and level of education. In this study mother with higher education were more knowledge about neonatal care. Similarly in the study with Memon et al. about knowledge, attitude, and practice among mothers about newborn care in Sindh, Pakistan indicated that among the study sample, more than half of the newborns were bathed within six hours of delivery. Around 50% started breastfeeding after 1 h of birth. A substantial proportion (45%) of mothers gave pre-lacteal feeding and 44.8% of them did not feed colostrom to their newborns. Mothers with no education had less significant KAP score about newborn care as compared to those who had higher education [23].

According to this study health worker and midwife in health center and spouse were the most subjective norm that influence on the knowledge, attitude of mothers about neonatal care.

This finding is consistent with the results of other studies for example in Vietnam showing that Fathers' support can influence mothers' breastfeeding decisions and behavior [24].

Therefore health worker and midwife need to gain the knowledge, attitudes, and adequate skills to deliver culturally competent care, including tools on how to effectively communicate with pregnant mothers or families from diverse cultural, socioeconomic, and level of education. Application of culturally appropriate communication is crucial. This will in turn help elicit helpful dialogue with pregnant women and families that will encourage them to ask questions in health centers and communicate their concerns more clearly to ensure the best delivery of the highest quality of neonatal care for every pregnant women. Beside the health worker, delivery health information through Mass-medias such as televisions, radio and booklet about neonatal care would change the women's misconception that would improve their service utilization.

This study also revealed that attitude towards neonatal care was positive associated with intention to neonatal care. Respondents who had a positive attitude towards neonatal care more likely to have intention than those who had a negative attitude. A similar result was reported in China which identified attitude women towards cervical cancer screening as the most significant factor that affects intention [25].

More than half of the mothers interviewed under the present study lacked the necessary knowledge to baby visit after birth, bathing the baby, baby holding temperature. Another study in China observed that 48.2% of the participants reported practicing neonatal care and range of score for each scale was knowledge 0–16 (M = 9.62), perceptions 28–103 (M = 79.99), barriers 17–85 (M = 65.40) and practice 11–55 (M = 34.44) [26].

In this study knowledge about neonatal jaundice 33% had inadequate knowledge but in study Amegan et al. about awareness, perception and preventive practices about neonatal jaundice in mothers in Accra showed that 92.6% did not know the causes of jaundice or had the wrong information and there was no significant association with their level of education [27]. In study Goodman et al in Nigeria showed that 68.9% of the mothers had a poor level of knowledge about neonatal jaundice. In this study age and educational qualification did not show any statistically significant relationship with knowledge about neonatal jaundice [28].

With considering neonatal jaundice is a preventable cause of neonatal morbidity and mortality. Therefore an improving pregnant mothers' knowledge will help with early recognition of neonatal jaundice, prompt and appropriate intervention.

According to this study considerable number of mothers lacked knowledge (73%) the proper temperature of the baby's room. These findings are considered low when compared with a study conducted in North Ethiopia, where 99.3% of the participants had the knowledge about temperature of the baby room [29]. This difference could be related to the difference in study participants in two countries Iran and Ethiopia.

This study revealed that the proportion of mother having adequate knowledge about benefits of breastfeeding (86%) and colostrum's (74%) which is almost similar with the findings in study in Jimma (66.4%) [30]. On the other hand, knowledge of the study participants in this study is slightly higher compared with study in Uganda (47%) [31]. This might be due to slight variation in the tools used and socio-economic variable in participant in countries

In study of Chhetri et al. about newborn care practices at home finding showed that initiation of breastfeeding was practiced by only 40% of mother. Among neonates, 65% were given colostrums and hand washing was practiced by 62.5% before touching the baby. For thermal care, burning charcoal (75%) was mostly used. The study revealed association between newborn care and mother education and per capita income of family [32].

According this study 40% of pregnant women knowledge about bathing the baby. In the study in Pakistan (32%) and Southern Tanzania (60%) of respondents stated that they bathed their newborns within six hours after birth [33–34].

The results also show that over 47% of mothers did not have any knowledge about take care of the baby's umbilical cord, 60% did not have any knowledge about how to bathing the baby.

In contrast another study in Jordan [35] and Arab society [36] which showed that neonatal care in mothers most lacked knowledge.

The mothers also showed a lack of knowledge about to visit the baby on the days after birth by health care (59%). Based on this study health workers at health centers must have been knowledge enough to advise pregnant women to have visit neonatal after birth.

In this study intention behavior for neonatal care was 4.4 score. Similarly in study Andre et al. about influential factors in influenza vaccination during pregnancy showed that, 76% of pregnant women had received the influenza vaccination. Intention of women for vaccination was the desire for neonatal protection, the common reasons for not being vaccinated were not receiving information on vaccination or safety concerns [37].

In this study 22% of mothers don't know recognizing danger sign in neonatal. Welay et al in study indicated that a knowledge score of neonatal danger signs was found 32.9%. Mothers educated to secondary level and mothers whose husband educated to college and above were 4.9 times more likely to know about neonatal danger signs [8].

This study tested the applicability of the knowledge and perceived behavior control R^2 = 32% in the prediction of neonatal care intentions. In fact the findings of this study show partial support for the predictive ability of the theory of planned behavior in predicting intentions in pregnant women for neonatal care.

In Wang study about predicting women's intentions to screen for breast cancer R^2 = 8.3% in the prediction of breast cancer screening intentions [38]. Sun et al in another study about predicting iron consumption intention in women showed that the model explained 35–55% of the variance of behavioral intention [39].

In fact TPB assumes that attitude, subjective norms, and perceived behavioral control lead to the development of a behavioral intention and so the behavioral intention is the immediate antecedent of behavior [40].

Our study findings reflected that perceived behavior control were significant construct of TPB to intention behavior for neonatal care among mothers. The present study had some limitations. The research is a cross-sectional study, and all independent and dependent variables were measured in a single point of time. All variables were self-reported, which may lead to misclassification due to recall and reporting bias. This limitation was resolved by allocating sufficient time and explicit expression of the objectives of study, and gathering information along with interviewing. Further research with larger and more diverse samples was suggestion.

Regardless of these limitations, this study has advantages. One of the strengths of the present study is that the design of the protocol based on theory center for asses neonatal care.

Cognition is a critical process to practice good health behavior. Theoretical based research can help to understand the cognition elements better. The TPB constructs of perceived control behavior and attitude explain significant to increase intention behavior among pregnant women about neonatal care.

Finally, it can be said that this study show support for the predictive ability of the TPB in predicting for neonatal care therefore the design of educational intervention should be based on intention and knowledge as the most important predictors of maternal behavior

Conclusion

Neonatal care is an important fact worldwide as well as Iran and health needs to be concerned as neonatal are the most vulnerable population. Our study provides evidence of potential factors to strengthen intention behavior with improving knowledge, perceived behavior control, and increasing for neonatal care. Thus, efforts should be exerted

to improve the attitude of women involving influential people, which could improve women's intention for neonatal care performance.

According to the results of the study health workers, and midwife play a critically important role in the development of knowledge and attitude mothers about neonatal car. By identifying the lack of knowledge of mothers, the findings of this study can inform and suggestion the design of educational program for pregnant women by focusing on construct perceived control behavior for health promotion neonatal care. Moreover, behavioral change communication focusing on the constructs of the theory of planned behavior is crucial. Finally the theory of planned behavior constructs is useful to predictive of neonatal care in pregnant women, which may be useful in the future to design interventions for educational mothers in period of pregnancy.

Abbreviations

TPB; Theory of Planned Behavior; CVR:Content Validity Ratio; CVI:Content Validity Index.

Declarations

Ethics approval and consent to participate

All the procedures performed in the study involving human participants, were in accordance with the ethical standards. The present study was approved by the Research Council of Arak University of Medical Sciences (Grant Number:2957). Ethics committee approval code number is (IR.ARAKMU.REC. 1397. 169). Moreover informed written consent was obtained from the mothers and all the procedures performed in the study involving human participants, were in accordance with the ethical standards.

Consent for publication

Not applicable.

Competing interests

The authors have no conflict of interest to declare; the researchers have no personal or financial affiliations with the parties involved with the study.

Availability of data and materials

Upon request, we can offer onsite access to external researchers to the data analyzed at Arak University of Medical Sciences, Arak, Iran.

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Authors' contributions

AN, conceptualized, designed, acquisition of data; MS, conceptualized, designed, initial analysis and interpretation of data; drafted, and revised the manuscript; MK, conceptualized, designed, initial analysis and interpretation of data; drafted, and revised the manuscript; MR, conceptualized and designed the study, drafted, analyzed and

interpreted the data and critically reviewed and revised the manuscript; and all authors approved the final manuscript as submitted and agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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