The Relationships between Perceived Nutritional Status, Perceived Dietary Self-Efficacy and Dietary Behavior among Bangladeshi Pregnant Women

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Abstract

The maternal mortality rate is still high in Bangladesh. Anaemia is an important cause of maternal death, and 46% of pregnant women were anaemic. The objectives of this study were: to identify the level of perceived nutritional status (PNS), perceived dietary self-efficacy (PDSE), and dietary behavior (DB); and to examine the relationships between PNS and DB and between PDSE and DB. A descriptive correlation design was used. The sample consisted of 138 pregnant women. The instruments consisted of four parts. Descriptive and inferential statistics were used for data analysis. Frequencies, percentages, means, standard deviations, and Pearson product-moment correlation coefficients were used to examine the relationships among variables. The results indicated that pregnant women reported high levels of PNS (M = 3.77, SD = .46), PDSE (M = 3.97, SD = .47) and DB (M = 3.94, SD = .47). All sub-dimensions of PDSE and 2 sub-dimensions of DB were at a high level. Only the supplementary sub-dimension was moderate. The PNS was positively highly correlated with DB (r = .71, p < .01), and PDSE was positively very highly correlated with DB (r = .92 p < .01). The results provide baseline information for providing antenatal care to Bangladeshi pregnant women in relation to increases in supplementary diet during pregnancy to improve childbirth outcomes. However, further studies are needed to determine whether pregnant women in other parts of Bangladesh had similar results as those in the urban part.

Keyword: nutrition, dietary self-efficacy, anaemia, dietary behavior, pregnancy.
Background and significance of the problem

Pregnancy is a transitional period when every system in the body is affected. This involves many biological, psychological and social changes that begin from pregnancy and extend to the postpartum period (McCormick, 2003). A current report has shown that the maternal mortality rate (MMR) in Bangladesh is the worst in South Asia (Investor Relations Information Network [IRIN], 2008). It is about 570 per 100,000 live births which is poor compared to the rates found in neighbouring countries such as India and Pakistan which are about 450 and 320 per 100,000 live births respectively (IRIN, 2008). One study found that MMR is still 3.2 per thousand live births (National Institute of Population Research and Training, 2007 as cited in Chowdhury, Hossain, & Halim, 2009).

Twenty one thousand women die annually in Bangladesh due to childbirth (IRIN, 2008). Eighty percents of maternal deaths occur in the rural areas; the major causes of death are haemorrhaging anaemia, infection, hypertensive disorders, obstructed labor and abortion (IRIN, 2008). Nutritional anaemia during pregnancy is associated with maternal and infant morbidity and mortality that result in 28 percent foetal loss, 30 percent perinatal and 10 percent neonatal deaths (Sahoo & Panda, 2006). In Bangladesh, 46% pregnant women were anaemic (Hossain, n.d.).

Several factors are related to dietary behaviors such as knowledge, attitude, socio-economical status, education and cultural beliefs (Hearty, McCarthy, Kearney, & Gibney, 2007; Inglis & Crawford, 2005). Dietary behaviors can reduce adverse birth outcomes (Bang & Lee, 2009). A healthy mother can produce a healthy baby. Malnourished mothers deliver underweight babies resulting in high infant mortality rates (Sahoo & Panda, 2006). Self-efficacy helps to make sense of people’s experience and explore their own cognitions and self-beliefs that engage in self-evaluation and alter their thinking and behavior and affect human functioning (Schumacher et al., 2006). Young and middle-aged Belgian women who had better knowledge of nutrition also exhibited better dietary behavior (Vriendt et al., 2009).

Perceived nutritional status and perceived dietary self-efficacy could change the dietary behavior of pregnant women which will be of benefit to mother and baby. The nutritional anaemia of pregnant women could be reduced by an increased awareness about the intake needed for a healthy diet. This includes the need to have food fortified with iron, gain knowledge disseminated through ANC visits, and increasing sources of income through farming fruit and vegetable plantations. This study will contribute by finding the current status of pregnant women’s perceptions about nutritional status, dietary self-efficacy, and
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dietary behavior and their relationships. This could therefore contribute to helping develop strategies to deal with this situation.

Objectives

The objectives of this study were to: 1) identify the level of perceived nutritional status, perceived dietary self-efficacy, and dietary behavior among Bangladeshi pregnant women; and 2) to examine the relationships between perceived nutritional status, perceived dietary self-efficacy, and the dietary behavior of Bangladeshi pregnant women.

Technical terms

Perceived nutritional status refers to the pregnant women’s opinion related to current body status in terms of their state of nourishment, that is, nutritional anaemia, leg cramp, dehydration, and appropriate weight gain. Perceived nutritional status was measured by a structural Perceived Nutritional Status Questionnaire developed by investigator.

Perceived dietary self-efficacy refers to the pregnant women’s confidence in their ability to perform dietary behaviors related to the quality of diet, supplementary diets, and avoiding diets that induce negative birth outcomes. Perceived dietary self efficacy was measured by a structural Perceived Dietary Self-Efficacy Questionnaire developed by investigator.

Dietary behavior refers to pregnant women’s current actions to promote their nutritional status which includes the quality of diet, supplementary diets and avoiding diets that induce negative birth outcomes. Dietary behavior was measured by a structural Dietary Behavior Questionnaire developed by investigator.

Framework of the study

The conceptual framework of this study was based on the concept of Bandura’s Self-Efficacy (Bandura, 1997) and a literature review. Dietary self-efficacy is strongly associated with children’s food choice (Parcel et al., 1995). According to the literature review, dietary behavior mainly consists of 3 dimensions including the quality of diets, supplementary diets and avoiding diets (Hughes, 2008). The investigator wished to explore the relationships between the PNS, PDSE, and DB among Bangladeshi pregnant women.
Figure 1. Conceptual framework of the study

**Research methodology**

**Research design**

A descriptive correlation design was used to obtain levels of PNS, PDSE, and DB and to examine the relationships among those variables.

**Sample and setting**

The setting for this study was Shaheed Suhrawardy Medical College Hospital (SSMCH), Dhaka, Bangladesh. The sample consisted of 138 pregnant Bangladeshi women who received antenatal care from December 2009 to January 2010. Convenience sampling was used for recruiting eligible subjects. The inclusion criteria for selecting the subjects were that they were to be primipara pregnant women who had no complications during pregnancy. The sample size was calculated by using power analysis, effect size 0.25, accepted power of 0.80, and a significance level 0.05. The sample size consisted of 126 pregnant women. No existing studies related to this topic were found, thus, the researcher use effect size 0.25 to gain sufficient sample size. Polit and Beck (2008) stated that most nursing studies used an effect size less than average to make sufficient sample size. Thus, in the present study, the researcher selected an effect size of .25. To avoid missing data therefore, during the data collection period 138 subjects were finally selected.

**Instruments**

The instruments used for this study were the structured questionnaires developed by the investigator. Four instruments were constructed in four sections: 1) The Demographic Characteristics and Pregnancy History Questionnaire (DCPHQ); 2) The Perceived Nutritional Status; 3) The Perceived Dietary Self-Efficacy; 4) The Dietary Behavior.
Section 1: The Demographic Characteristics and Pregnancy History Questionnaire requested information regarding each women’s age, religion, education, occupation, marital status, family income, family characteristics, geographical area and distance from the hospital. The researcher constructed obstetric information regarding their last menstruation period (LMP), gestational age, common problems, planned or unplanned pregnancies, and laboratory test reports. These included Hb%, and body weight, height, and body mass index (BMI).

Section 2: The Perceived Nutritional Status Questionnaire (PNSQ) was used to identify the level of PNS. It consisted of twelve items and framed positively.

Section 3: The Perceived Dietary Self-Efficacy Questionnaire (PDSEQ) was used to identify the level of PDSE of pregnant women. It consisted of twenty items and was composed of 3 components including: the quality of diet (10 items); supplementary diet (6 items); and avoiding diet (4 items). A 5 point Likert scale was used to range the score. The twenty items were framed positively.

Section 4: The Dietary Behavior Questionnaire (DBQ) consisted of twenty items that were composed of 3 components including: quality of diet (11 items); supplementary diet (5 items); and avoiding diet (4 items). The twenty items were framed positively.

All of those questionnaires were scored from 1 to 5 in terms of: 1 = strongly disagree; 2 = disagree; 3 = some agree; 4 = agree; 5 = strongly agree. The higher scores indicated the higher level of each variable. For interpretation, the researcher divided the transformed score into three levels using well accepted criteria as follows: low (1.00 - 2.33); moderate (2.34 - 3.67); and high (3.68 - 5.00) (Kiess, 1996).

Content validity and reliability of the instruments

The content validity of the original English version questionnaires was tested by a panel of 3 experts in this field and the comments of the experts were used to modify each questionnaire for their appropriateness. The reliability of PNSQ, PDSEQ, and DBQ were assessed by using Chronbach’s alpha coefficients with 30 pregnant women and these yielded values of .86, .82, and .86, respectively.

Data collection procedure

Data were collected after approval was obtained from the Research Ethical Committee of the Faculty of Nursing, Prince of Songkla University, Thailand and from the director of Shaheed Suhrawardy Medical College Hospital. The researcher explained about and provided
a written consent form and informed them verbally how to complete the questionnaires. The subjects’ identities were not to be disclosed.

**Data analysis**

Descriptive and inferential statistics were used to analyze the data. Descriptive statistics consisting of frequencies, percentages, means, and standard deviations were used to analyze subject’s demographic characteristics and the levels of PNS, PDSE, and DB of pregnant women. Pearson product-moment correlation coefficients were used to examine the relationships among the PNS, PDSE, and DB of pregnant women. The significance level was set at 0.05 and more for the implications.

**Results**

**Subjects’ demographic characteristics**

The sample consisted of 138 pregnant women. The ages of the subjects ranged from 14 to 35 years with a mean score of 21.48 years (SD = 3.145). The majority of the subjects were young adults (20-25 years) (58.7%) and 32.6% of the subjects were teenagers. Most of the subjects were Muslim (94.9%). Fifty-seven pregnant women (41.3%) had completed at least high school. The majority of the pregnant women was housewives (73.2%) and lived with their spouse (99.3%). The average income per month of the pregnant women was Taka 10,340.58 ($ US 148) (SD = 7632.28 or approximately $ US 100) per month and 55 % of the pregnant women had incomes ranging from Taka 5000-10000 per month (approximately $ US 71.42- 142.85). More than half of the subjects lived in a nuclear family (52.9%) and were living in urban area (87.0%). Most of the subjects reached hospital within half an hour (67.4%). All the pregnant women had no complications. Most cooked for themselves (71%). Almost all the pregnant women had their baby through planning (96.4%).

**Level of perceived nutritional status, perceived dietary self-efficacy, dietary behaviors of pregnant women**

**Level of perceived nutritional status**

The pregnant women recorded a high level in the mean score of PNS (M = 3.77, SD = .46) (see Table 1). However, more than a half of the pregnant women reported a high level of PNS (55.1%) (see Table 2).
Level of perceived dietary self-efficacy

The pregnant women recorded a high level in the overall mean score of PDSE (M = 3.97, SD = .47) and all sub-dimensions: quality diet (M = 3.86, SD = .54); supplementary diet (M = 3.75, SD = .60); and avoiding diet (M = 4.57, SD = .43) (see Table 1). In addition the majority of pregnant women reported a high level of PDSE (73.9%). (see Table 2)

Level of dietary behavior

Pregnant women recorded a high level in the overall mean score of DB (M = 3.94, SD = .47) and two sub-dimensions of DB were at high level. Only the supplementary diet was at a moderate level (M = 3.41, SD = .70) (see Table 1).

Table 1
Levels of Perceived Nutritional Status, Perceived Dietary Self-efficacy, and Dietary Behavior of Pregnant Bangladeshi Women (N = 138)

<table>
<thead>
<tr>
<th>Variables</th>
<th>M</th>
<th>SD</th>
<th>Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived nutritional status</td>
<td>3.77</td>
<td>.46</td>
<td>High</td>
</tr>
<tr>
<td>Perceived dietary self-efficacy</td>
<td>3.97</td>
<td>.47</td>
<td>High</td>
</tr>
<tr>
<td>Quality diet</td>
<td>3.86</td>
<td>.54</td>
<td>High</td>
</tr>
<tr>
<td>Supplementary diet</td>
<td>3.75</td>
<td>.60</td>
<td>High</td>
</tr>
<tr>
<td>Avoiding diet</td>
<td>4.57</td>
<td>.43</td>
<td>High</td>
</tr>
<tr>
<td>Dietary behavior</td>
<td>3.94</td>
<td>.47</td>
<td>High</td>
</tr>
<tr>
<td>Quality diet</td>
<td>3.92</td>
<td>.53</td>
<td>High</td>
</tr>
<tr>
<td>Supplementary diet</td>
<td>3.41</td>
<td>.70</td>
<td>Moderate</td>
</tr>
<tr>
<td>Avoiding diet</td>
<td>4.63</td>
<td>.39</td>
<td>High</td>
</tr>
</tbody>
</table>
Table 2

*Frequencies and Percentage of Levels of Perceived Nutritional Status, Perceived Dietary Self-efficacy, and Dietary Behavior of Pregnant Bangladeshi Women (N = 138)*

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>Low</th>
<th>Moderate</th>
<th>High</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>n</td>
<td>%</td>
<td>n</td>
<td>%</td>
</tr>
<tr>
<td>Perceive nutritional status</td>
<td>0</td>
<td>0</td>
<td>62</td>
<td>44.9</td>
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<tr>
<td>Perceived dietary self-efficacy</td>
<td>0</td>
<td>0</td>
<td>36</td>
<td>26.1</td>
</tr>
<tr>
<td>Quality diet</td>
<td>0</td>
<td>0</td>
<td>48</td>
<td>34.8</td>
</tr>
<tr>
<td>Supplementary diet</td>
<td>0</td>
<td>0</td>
<td>66</td>
<td>47.8</td>
</tr>
<tr>
<td>Avoiding diet</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>3.6</td>
</tr>
<tr>
<td>Dietary behavior</td>
<td>0</td>
<td>0</td>
<td>35</td>
<td>25.4</td>
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<tr>
<td>Quality diet</td>
<td>0</td>
<td>0</td>
<td>45</td>
<td>32.6</td>
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<tr>
<td>Supplementary diet</td>
<td>5</td>
<td>3.6</td>
<td>83</td>
<td>60.1</td>
</tr>
<tr>
<td>Avoiding diet</td>
<td>0</td>
<td>0</td>
<td>2</td>
<td>1.4</td>
</tr>
</tbody>
</table>

**The Relationships between Perceived Nutritional Status, Perceived Dietary Self-Efficacy, and Dietary Behavior of Pregnant Bangladeshi Women**

The study’s findings show that there was a high positive statistically significant relationship between PNS and DB ($r = .71$, $p < .01$). There was a very high positive statistically significant relationship between PDSE and DB ($r = .92$, $p < .01$).

**Discussions**

The pregnant women had an average income of ($US148) per month. In addition, 55% of the pregnant women had incomes ranging from approximately $US 71.42-142.85 per month. The majority of the pregnant women attended the high school (41.3%). The majority of subjects were young adult (58.7%).

**Level of perceived nutritional status**

These findings reveal that the pregnant women reported a high level of PNS. The majority of subjects were young adult and most of the women lived in urban areas. They were thus able to get information from the health care providers because it was easy to access care. Moreover, they could get information from different sources such as nongovernment organizations (NGOs) and government television (TV), radio, and posters to enhance their...
nutritional status. Thus social acceptance seems to be a resource which increases and enhance motivation as well as promoting the need to improve nutritional status. Similarly, Chatterjee and Lambert (1989) found that illiteracy and inferior social status influenced pregnant women’s PNS in developing countries. Education can influence the maturation of thought through knowledge. Knowledge is an important aspect of the cognitive dimension which influences the perception of pregnant women’s nutritional status.

More than a half of the women had good socio-economic status that could mean access to facilities and give opportunities to obtain and maintain their high level of nutritional status and well-being. Similarly, another study found that more educated and high-income participants were much more likely to participate in nutrition-related disease management program (Engelhardt, Ahn, Cho, & Joung, 2006). The BMI of the majority of women was >18; thus, they had acquired a high level of nutritional status. The BMI is an important indicator for maintaining nutritional status. Similarly, another previous study showed that low BMI was associated with preterm delivery, low birth weight and anaemia (Sahu et al., 2007 as cited in Daise, 2009). Moreover, the pregnant women in this study had no complications so they might perceive a high level of nutritional status.

Level of perceived dietary self-efficacy

This finding of the study revealed that subjects were healthy mothers because more than half of the pregnant women (51.4%) ate 3 meals a day with appropriate amounts. In addition, a majority of the women’s BMI (91.3%) was more than 18. For this reason pregnant women reported a high level of PDSE. Moreover all subjects had no complications during pregnancy. Pregnant women were more confident about their rationale for dietary efficacy so that 80% of the subjects strongly agreed about avoiding uncooked and unclean food. Most of the mothers were housewives and 71% of the pregnant women cooked for themselves. They thus perceive high levels of dietary self-efficacy in preparing food.

Level of dietary behavior

This study also found that pregnant women rated a high level of dietary behavior. The majority of the pregnant women attended a high school. They had enough income for staying at school. Almost all the pregnant women (96.4%) had planned to have their baby and therefore they might eat quality food to make their baby healthy. In addition, almost all the pregnant women lived with their spouse (99.3%). Thus they received love, affection, and support from their husband and family. A previous study found that dietary behavior was associated with perceived health status and socioeconomic status, behavioral risk
factors such as smoking and a sedentary lifestyle. It was also affected by less income, fewer years of education, unemployment and greater likelihood of engaging in poor dietary practice than their counterparts (Lu, Samuels, & Huang, 2002). In this study family bonding was very strong which positively contributes to achieving a high level of dietary behavior. A previous study found that young and middle age women who had better knowledge of nutrition engage in a better DB (Vriendt et al., 2009).

The relationships between perceived nutritional status, perceived dietary self efficacy, and dietary behavior of pregnant Bangladeshi women

The findings of this study revealed that PNS was highly and positively correlated with DB. This indicates that pregnant women who had higher PNS would have higher DB. This study’s findings support the self-efficacy theory of Bandura (1997). In addition, a well known theory, the health promotion theory, stated that perceived health status positively correlated with promoting healthy behavior (Pender, 2006). Another study found that women who had better knowledge of nutrition would engage in better DB (Vriendt et al., 2009). Thus this study’s findings are congruent with the health promotion theory.

These findings also found that PDSE was very highly and positively correlated with DB (r = .92, p < .01). Similarly, previous studies found that dietary self-efficacy is directly and strongly associated with the usual food choice (Parcel et al., 1995). It has been found that higher levels of self-efficacy of pregnant women are positively associated with DB. For example, taking healthy food is in line with positive birth outcomes without complication (Bandura, 1997). Similarly, a previous study found that there was a positive association between self efficacy and DB among Korean women (Gutiérrez-Doña, Lippke, Renner, Kwon, & Schwarzer, 2009). In addition, two previous studies found that self-efficacy improved food consumption behavior among elderly people with diabetes mellitus and with coronary artery disease (Chaiarsa, Sucamvang, & Pramoch, 2008; Tinamas, 2007). Thus, this present study’s findings support that PDSE is related to DB among pregnant women.

Conclusions

A descriptive correlation design was used. The results revealed that the pregnant women reported high levels of mean scores of PNS, PDSE, and DB. All sub-dimensions of PDSE and 2 sub-dimensions of DB were at a high level. Only the supplementary sub-dimension was moderate. This study found that there were positive relationships among PNS, PDSE, and DB.
Recommendation

This study has implications for nursing practice, nursing education and nursing research. Mothers will be able to maintain a healthy lifestyle for the sake of the foetus through changing their dietary behavior. This is also helpful to reduce maternal and infant mortality rates. To improve the quality of antenatal care, further studies should be conducted in different settings and with large samples.

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Reference


