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Abstract

Selected aspects of the phenomenon of labor stress including the relationship between labor stress and nursing support were explored using a correlational design with 85 postpartum women who delivered vaginally and were recruited from a midwestern general hospital in the United States. The Wijma Delivery Expectancy/Experience Questionnaire measured labor stress while the Bryanton Adaptation of the Nursing Support in Labor Questionnaire measured nursing support during labor. Significant positive correlations were found between number of labor hours and labor stress (r = .25, p = .020) and number of labor hours and number of labor procedures (r = .23, p = .031). A significant negative correlation (r = - .36, $p < .01$) between labor stress and nursing support was found. Data from this study confirmed previous findings regarding nursing support and emphasized the important role that nursing support plays in alleviating labor stress.

Keywords: Labor, stress, nursing

Introduction

Selye (1983; 1991) defined stress as a non-specific result of any demand upon the body, be the effect mental or somatic. Stress was also defined as "a dynamic, progressive relationship between the person and the environment" (Lazarus & Folkman, 1984, p. 290). Researchers have found that stress has a dichotomous nature; it has a good side and a bad side. Both good and bad effects of stress on all aspects of the human condition (e.g. physiological, psychological, cognitive, and social dimensions) have been documented for six decades (Selye, 1983; Lazarus & Folkman, 1984; Rand, 1986; Simkin, 1986a; Simkin, 1986b; Stolte, 1987; Avant, 1988; Annie & Groer, 19991; Selye, 1991; Younger, 1991; Austad, 1995; Lederman, 1995a; Lederman, 1995b; Sapolsky, 1996; Alehagen, Wijma, Lundberg, Melin & Wijma, 2001; Baron, Cusumano, Evans & Hodne, 2004; Alehagen, Wijma, Lundberg, & Wijma, 2005). For the purposes of this study, labor stress is defined as the level of psychological stress, representing a combination of fear and pain, which is experienced by women during labor.

Labor, as a life event, is characterized by tremendous physiological and psychological changes that require major behavioral adjustments in a short period of time (Selye, 1991; Wijma, Wijma & Zar, 1998; Baron et al, 2004; Alehagen et al, 2001). Consequently, the process of labor constitutes a unique set of "stressors" that challenges a woman's ability to cope. Nonetheless, there is a lack of consensus among researchers

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regarding what constitutes labor stress, how labor stress is measured and how labor stress is connected to labor outcomes. Hence, further exploration of the complex phenomenon of labor stress should take place if positive outcomes in reproductive health are to be achieved.

Stress and Labor

In the context of labor, researchers have confirmed the dichotomous nature of stress. Labor stress has been shown to trigger and enhance adaptive responses in both mother and fetus, which may contribute to preventing adverse labor outcomes such as fetal and/or maternal morbidity and mortality. Conversely, labor stress has been linked to detrimental outcomes including immunosuppression, fluid and electrolyte imbalance, delayed wound healing, diminished uterine contractions and prolonged labor in the mother (Alehagen et al., 2001). Furthermore, labor stress causes poor adaptation to extrauterine life and neonatal pathology including heart anomalies, respiratory distress, impaired immunity, hyperbilirubinemia, and necrotizing enterocolitis. Wijma et al. (1998) have also reported that labor stress can have deleterious effects on neonatal neural development and behavior including impaired motor ability, impaired balance reactions, shorter attention spans, impaired muscle coordination and tonicity, greater infant irritability, and decreased coping ability.

Labor stress may also contribute to depression, concerns regarding children, concerns about parenting capacities, negative interpretations of the pregnancy experience, and decreased confidence (Maclean, McDermott & May, 2000). Researchers have found that certain variables can influence labor stress. Variables such as nulliparity, low levels of formal education, absence of antenatal education and unaccepted pregnancy were linked to increased labor stress (Hofberg & Brockington, 2000; Rasch, Knudsen & Weilandt, 2001). Furthermore, a high level of labor stress has been associated with cesarean delivery, increased numbers of labor procedures and longer labors (McNiven, Williams, Hodnett, Kaufman & Hannah, 1998; Maclean et al. 2000; Sadler, Davison & McCowan, 2001).

Labor Stress and Nursing Support

Investigators have found an inverse association between labor stress and nursing support. Classic studies have indicated that women who received support during labor, regardless of type, had significantly lower rates of cesarean and forceps deliveries, shorter labors, and reduced rates of use of analgesia compared to women who did not receive support (Kennell, Klaus, McGrath, Robertson, & Hinkley, 1991; Tarkka & Paunonen, 1996; Manogin, Betchel, & Rami, 2000; Corbett & Callister, 2000; Hodnett, 2000; Hodnett, Lowe, Hannah, Willan, Stevens, Weston, et al., 2002; Tumblin & Simkin, 2001).

Bryanton, Fraser-Davey, & Sullivan (1994) found that emotional nursing support behaviors such as making the woman feel cared about as an individual, giving praise, appearing calm and confident, assisting in breathing and relaxing, and treating the woman with respect were the most helpful to laboring women. Consequently, a replication of study found that informational support in the form of praising the woman was reported to be the most helpful nursing support behaviors during labor among Chinese women (Holroyd, Lee, Pui-Yuk, Kwok-Hong, & Shuk-Lin, 1997).

This study focused on exploring selected aspects of the phenomenon of labor stress including number of labor procedures, number of labor hours and nursing support. It also investigated specifically the relationship between labor stress and nursing support.

Purpose

The purposes of this study were to explore selected aspects of the phenomenon of labor stress and to examine the relationship between labor stress and nursing support as reported by laboring women. The main research questions for this study were:

- What is the relationship between number of labor hours and labor stress?
- What is the relationship between number of labor hours and labor procedures?
- What is the relationship between labor stress and nursing support?
- What are the predictors of labor stress?

Method

Design

A correlational design based on Lazarus & Folkman's (1984) transactional theory of stress and coping was used. Lazarus & Folkman viewed the relationship between the person and the environment as being dynamic, mutually reciprocal, and bidirectional. Lazarus & Folkman's transactional model also emphasizes the idea that stress results from person-environment interactions that lead to individual physiological and psychological responses.

In the context of labor, there is a dynamic and reciprocal relationship between the woman who is experiencing labor and the birthing environment. The relationship is dynamic because stress during labor is a changing entity that easily shifts from eustress to distress and visa versa throughout the different stages of labor. It is reciprocal because the birthing environment exerts certain stressors on a woman who is giving birth and in return that woman produces certain stress responses.

Sample

Eighty-eight women were approached to participate in this study. Three women declined participation in the study due to the presence of children and visitors in the room The final convenience sample consisted of 85 women in the first 48 hours postpartum who were recruited from a general hospital in the Midwest.

Instruments

To assess labor stress, the Wijma Delivery Expectancy/ Experience Questionnaire (WDEQ) was used (Table 1). The WDEQ is a 33-item 6-point likert-type scale ranging from 1 (extremely) to 6 (not at all) that assesses feelings and thoughts regarding childbirth. Examples of items on the WDEQ are "not feeling lonely, feeling strong, feeling confident and not feeling deserted". The WDEQ has a reported alpha coefficient of .93 and had established construct validity (Wijma et al., 1997). According to authors, the higher the score on the WDEQ, the more negative the appraisal of the childbirth experience, indicating more fear of childbirth and hence more stress. Wijma and associates also found that regardless of any other variables, primiparous women scored higher on the WDEQ than multiparous women in general ($X^2=8.67$, p< .003). The authors also found that multiparous women (n=998) had less negative cognitive appraisal of childbirth compared to primiparous women (n=642).

The Bryanton Adaptation of the Nursing Support in Labor Questionnaire (BANSILQ) measured nursing support during labor (Table 2). The BANSILQ has 25 items that assess nursing support behaviors using a 5-point Likert scale that ranges from (1) not at all helpful to (5) very helpful. The nursing support behaviors were categorized into three categories: emotional (e.g. treated me with respect, made me feel cared about as an individual), tangible (e.g. made me physically comfortable, assisted me in breathing/relaxing) and informational (e.g. explained hospital routines, familiarized me with my surroundings). The higher the score on the BANSILQ, perceptions of more supportive nursing behaviors were reported. The reported alpha reliability for the BANSILQ was .93 and had content validity (Bryanton et al., 1997). In this study, alpha coefficients were .88 and .89 for WDEQ and the BANSILQ, respectively.

Specifically for the purposes of this study, the investigator developed a third and fourth instrument after an extensive literature review. The third instrument elicited demographic data such as age, race, marital status, and socioeconomic status. The fourth instrument was used to obtain relevant information from both clients and hospital records related to parity, prenatal education, planning of pregnancy, type of delivery, sex of the baby, the most helpful person during labor, labor procedures used in vaginal deliveries (e.g vaginal exams, fetal monitoring, rupture of membranes, induction of labor, administration of analgesia and anesthesia) and labor length, which medical staff attended the delivery, and labor complications.

Procedure

Relevant Institutional Review Boards approved the study. Each participant was given a packet of instruments that included the WDEQ and the BANSILQ. Completion of the questionnaires took an average of 12 minutes. After the participants completed the two questionnaires, relevant information from the medical records was gathered using the third and fourth instruments.

Data Analysis

To investigate selected aspects of the phenomenon of labor stress and examine the relationship between labor stress and nursing support, descriptive and inferential statistics were used.

Results

Sample characteristics

The age of the participants ranged from 18 to 43 years (M= 28.7, SD= 5.9). Sixty-one (72%) women were Caucasian, 22 (26%) were African American and 2 (2%) were Asian. The majority of the women were white (72%), married (72%), multiparas (65%) and with a mean of 14.5 (SD = 2.9) years of formal education. The annual income for this sample ranged from $24000 to $35000. Four women refused to report their monthly income.

Labor process characteristics

The number of reported deliveries ranged from 1 to 6 (M=2.1, SD=1.2). Thirty-six women (42%) attended childbirth classes prior to this delivery. Most of the women (95%) had normal spontaneous vaginal deliveries of healthy term babies. Forty

respondents (47%) reported that their last pregnancy was planned. Eighty-four women had singleton deliveries while one woman had twins. Forty-three women (51%) in this study delivered sons. Fifty-four women (63%) reported that the most helpful person during labor was the husband/partner, while 15 women (18%) found the nurse most helpful. Women in this study had an average of 5.8 (SD= 1.3) labor procedures during childbirth. The most common labor procedures were external fetal monitoring, vaginal examination, administration of analgesia/anesthesia, and intravenous fluids. The number of hours in labor ranged from 2 to 24 with a mean of 7.3 (SD= 4.3). Primiparas had a mean of 8.9 hours of labor (SD= 5.1), while multiparas had a mean of 6.5 (SD= 3.9). Obstetricians attended the deliveries of all the women in the study. About 31 women (37%) had labor complications in the form of perineal or urethroperineal lacerations.
Labor stress and scores on the WDEQ

The scores on the WDEQ could range from 0 to 165. Higher scores on the WDEQ indicate more psychological stress during labor. For this study, the scores on the labor stress questionnaire (WDEQ) ranged from 0 to 121(Table 1). The mean score was 46.5 (SD= 20.7). Wijma et al. (1997) set the score of 84 as the cut-off score, indicating that a score of 84 or above was a high level of stress during labor. Eighty-one women (96%) scored less that 84 on the WDEQ, while three women (4%) in this study scored higher than 84 on the WDEQ. On the WDEQ, most of the scores were between 51 and 60. Upon further analysis of the individual 33 items on the WDEQ, the following results were obtained: 26 women (31%) reported mild tension (item 12), 22 women (26%) reported mild fear (item 2), and 27 women (32%) reported extreme pain during labor (item 24). These three items (tension, fear, and pain) represent the core concepts of the Dick-Read method of natural childbirth (Dick-Read, 1959). Dick-Read proposed that when a woman in labor experienced fear, it led to tension which lead to pain, which led to more fear, thus a cycle of emotions (Dick-Read, 1959; Eakes, 1990; Humenick, 1995; Spence, 1996).

Nursing Support and the BANSILQ

Possible scores on the BANSILQ could range from 0 to 125. The scores on the BANSILQ, ranged from 39 to 125 in this study. The mean score was 104.9 (SD= 18.3). Higher scores on the BANSILQ indicate more support from nurses during labor.

Eleven women (13%) rated the 25 nursing behaviors as very helpful and gave their nurses the highest score possible (125) on the BANSILQ. Fifty women (59%) rated the nursing behaviors at the level of the mean (105) or higher. The scores on the BANSILQ were negatively skewed in which the majority of score were high scores.

Additional analysis of the individual 25 items of the BANSILQ showed that some nursing behaviors were not experienced by all the women during labor and were rated as "not applicable". These nursing behaviors included receiving instructions in breathing and relaxing methods (item 8, n= 11), spending time in the room with the woman even if the nurse did not have a specific job to do (item 13, n =11), being touched (item 14, n= 14), receiving pain medication (item 18, n= 24), providing distractions by talking to them (item 20, n= 10), providing for the physical needs of their husbands/partners (item 23, n=17), encouraging their husbands or partners involvement during labor (item 24, n=13), and supporting the way the women and their husbands/partners worked together during labor (item 25, n=13).

In this study, the nursing behaviors reported as being most helpful during labor, according to the rank of item means included: treating the woman with respect, making the woman feel cared about as an individual, answering questions truthfully, appearing calm and confident, giving praise, keeping the woman informed about her progress, carrying out the woman's wishes, providing a sense of security, recognizing when the woman was anxious, and explaining hospital routines.

Significant relationships

Significant positive correlations were found between number of labor hours and labor stress (r = .25, p = .020) and number of labor hours and number of labor procedures (r = .23, p = .031). A significant negative correlation was found between labor stress and nursing support (r = - .36, p = .001). Using hierarchical regression, nursing support and number of labor hours were found to be predictors of labor stress in this study.

Discussion

The purpose of this descriptive correlational study was to explore selected aspects of the phenomenon of labor stress, specifically the relationship between labor stress and nursing support. One of the problematic areas for this study was the scarcity of reliable and valid instruments that could be used to accurately measure the concept of labor stress. Therefore the WDEQ, which was originally designed to measure fear of childbirth, was used to measure the concept of labor stress since the concepts of stress and fear were found to be interrelated in the literature (Wijma et al, 1998). Nevertheless, the discrepancy in measuring the concepts of fear and labor stress may have affected the results of this study. In this study, no significant differences were found between the scores of primiparas and multiparas on the WDEQ. In contrast, Wijma et al. (1997) found that primiparas scored higher on the WDEQ. Furthermore, this study measured labor stress retrospectively in women in the postpartum period, while Wijma and associates measured labor stress in the antenatal period. The difference in the time of concept measurement may have caused the discrepancies in the results. The lack of score differences between primiparas and multiparas in this study may be attributed to the stressful nature of the labor process, regardless of parity. Another possible explanation for the absence of differences between primiparas and mulitparas is that women today are better educated, better informed and older, compared to laboring women in the past. Women today have more choices and input regarding their labor experiences, regardless of the number of deliveries that they had. They have moved beyond being mere recipients of health care to being active consumers of health care. This shift in behavior and attitude may have helped minimize the differences among the two groups in the perception of labor stress.

Labor stress was found to have a statistically significant positive relationship with number of labor hours. The correlation between perceived labor stress and number of labor hours is a reasonable one since the longer the labor, the more stressful it may become. This finding is similar to the results reported by Lederman (1995a & b) and Hofberg & Brockington (2000).

In many countries, the presence of the father/partner and other support persons in labor is now a routine experience for laboring women. This is not necessarily true across the globe, in which case the importance of nursing support becomes paramount (Kennel et al., 1991; Manogin et al., 2000; Hodnett et al., 2002). Labor stress was found to have a

significant negative correlation with nursing support. Women with greater nursing support reported less labor stress compared to women who received little support. Obviously, individual differences between labor experiences do exist. Restrictions in time, work overload, differences in the populations of laboring women, and the labor nurse's personal judgment of the situation may affect the type of supportive behaviors that are displayed during labor. This finding emphasizes the need to continuously assess nursing performances in stressful times such as labor. A viable solution for this situation would be improving job workloads and staffing policies as well as encouraging antenatal classes on labor preparation to try to meet the different needs of future laboring women since more than a third of this sample did not attend childbirth classes. Finally, gathering retrospective data and convenience sampling may have limited the generalization of the results of this study.

Clinical Implications

The results of this study emphasize the important role that nursing support plays in alleviating labor stress. Nurses were cited as a major source of support for laboring women second only to husband/partner support and should be recognized as such. Nursing behaviors that tap into emotional support were found to be the most effective. Emphasizing the emotional dimension of the process of labor in addition to the technical aspect can be very important. To maintain high standards of professional quality care in reproductive health, labor nurses need to recognize helpful nursing support behaviors to laboring women.

Finally, further investigations pertaining to labor stress are warranted due to limited studies in this area of research. Replication studies, use of diverse research designs and divergent populations, and ongoing research are suggested measures in the pursuit of understanding the very complex and multidimensional phenomenon of labor stress.

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Table 1: Frequency, Mean, and Standard Deviation of the 33 items on the WDEQ

Frequency Item	1	2	3	4	5	6	M	SD
1. Fantastic	10	24	20	13	9	7	2.10	1.46
2. Frightful	7	10	17	22	14	15	2.84	1.51
3. Lonely	1	2	5	2	8	67	4.53	1.09
4. Strong	15	23	23	17	5	2	1.76	1.26
5. Confident	19	13	27	20	4	2	1.80	1.29
6. Afraid	6	9	16	12	20	22	3.14	1.59
7. Deserted	1	2	7	0	4	70	4.65	0.88
8. Weak	6	3	14	17	24	21	3.33	1.46
9. Safe	51	20	5	5	0	4	0.76	1.27
10. Independent	13	10	28	16	7	11	2.32	1.53
11. Desolate	4	1	6	7	4	62	4.29	1.38
12. Tense	9	13	26	13	11	13	2.51	1.55
13. Glad	39	22	15	2	2	5	1.07	1.38
14. Proud	50	22	7	2	3	1	0.69	1.09
15. Abandoned	0	1	3	1	6	73	4.75	0.76
16. Composed	1	21	21	18	6	4	1.96	1.35
17. Relaxed	17	7	20	19	11	11	2.39	1.25
18. Happy	42	20	13	7	0	3	0.96	1.25

Table 1: Continued

Frequency Item	1	2	3	4	5	6	M	SD
19. Panic	8	7	21	8	13	28	3.12	1.71
20. Hopefulness	32	23	11	5	4	10	1.48	1.69
21. Longing for child	52	16	12	1	1	3	0.73	1.19
22. Self-confidence	26	26	25	5	2	1	1.22	1.10
23. Trust	50	23	10	1	1	0	0.59	0.84
24. Pain	27	15	21	12	16	4	1.61	1.47
25. Behaved badly	3	2	9	11	20	40	3.92	1.35
26. Surrendered control	22	14	19	13	7	10	1.99	1.67
27. Lost control	3	2	10	13	23	34	3.80	1.33
28. Funny	8	8	18	13	14	24	3.05	1.66
29. Natural	47	17	13	6	0	2	0.84	1.16
30. Self-evident	42	18	19	5	0	1	0.89	1.07
31. Dangerous	1	6	4	7	21	46	4.11	1.28
32. Child would die	56	17	2	6	1	3	0.68	1.25
33. Child injured	45	20	9	8	1	2	0.89	1.22

Table 2: Frequency, Mean, and Standard Deviations the 25 items of the BANSILQ

Nursing Behavior	Frequency						M	SD
	0	1	2	3	4	5		
1. Familiarized me with my surroundings.	7	1	1	7	17	52	4.14	1.47
2. Treated me with respect.	0	0	0	5	7	72	4.80	.53
3. Made me feel cared about as an individual.	0	0	1	4	9	71	4.76	.59
4. Explained hospital routines.	2	0	2	4	19	58	4.49	.98
5. Included me in making decisions.	4	0	0	5	16	60	4.46	1.15
6. Kept me informed about my progress.	2	1	0	4	14	64	4.58	.98
7. Answered my questions truthfully.	1	0	0	5	8	71	4.73	.75
8. Instructed me in breathing/ relaxing.	11	2	1	9	18	42	3.80	1.72
9. Assisted me in breathing/ relaxing.	8	2	4	11	18	42	3.82	1.5

Table 2: Continued

Nursing Behavior	Frequency 0	1	2	3	4	5	M	SD
10. Communicated my needs/wishes.	5	0	2	9	17	52	4.22	1.31
11. Tried to carry out my wishes.	2	1	0	3	17	62	4.56	.97
12. Provided a sense of security.	3	0	1	4	12	65	4.55	1.06
13. Spent time in room.	11	0	3	10	9	52	3.91	1.72
14. Touched me.	14	4	3	9	11	44	3.54	1.91
15. Attempted to lessen demands on me.	6	0	3	6	19	51	4.18	1.39
16. Accepted what I said/did.	6	1	2	3	14	59	4.29	1.41
17. Made me physically comfortable.	7	2	4	4	12	56	4.12	1.56
18. Gave me pain medication.	24	1	0	2	11	47	3.36	2.20
19. Praised me.	1	0	1	5	9	69	4.68	.80
20. Provided distractions by talking to me.	10	0	1	8	22	43	3.94	1.61
21. Appeared calm and confident.	1	1	0	8	22	43	4.73	.81
22. Recognized when I was anxious, listened.	2	1	1	4	14	63	4.54	1.02
23. Provided for my partner's physical needs.	17	6	4	7	14	37	3.25	2.01
24. Encouraged my partner's involvement.	14	4	4	5	13	45	3.58	1.92
25. Supported the way my partner and I work together.	13	4	3	6	11	47	3.68	1.90