

PREDICTORS OF ADAPTATION IN WOMEN HOSPITALIZED DURING PREGNANCY

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Hospital admission for high-risk pregnancy undoubtedly represents a period of stress, both for the expectant woman and for "significant others" with whom she holds ties of kin or friendship. Antepartum hospitalization is, in terms of the physical safety of mother and infant, widely believed to be beneficial (Blake, Pollitzer and Reynolds, 1979; Martin, Allen & Stinson, 1979), yet little is known about the overall impact of this event on the expectant woman and her family. Few studies have identified specific factors that create stress for women who are hospitalized during pregnancy (Waldron & Asayama, 1985; White & Ritchie, 1984). However, some evidence exists to suggest that these women may experience difficulty adapting to their at-risk situations (Corbin, 1987; Merkatz, 1976; Rosen, 1975). Despite this, little is known about specific factors that influence adaptation in women who are hospitalized for high-risk pregnancies.

Review of Literature

Stress is a perceptual phenomenon that arises from a demand/capability imbalance (Lazarus, DeLongis & Folkman, 1985). Thus, stress is a result of the individual's appraisal of his or her ability to cope with the demands of a particular situation, rather than the situation itself.

Antepartum stress has been associated with maternal and infant complications (Downs, 1977; Gorsuch & Key, 1974; Newton, Webster, Blau, Maskrey & Phillips, 1979), emotional disequilibrium (Norbeck & Tilden, 1983; Tilden, 1983) in low-risk pregnant women, and with anxiety and depression in low-risk women, high-risk women and their mates (Mercer & Ferketich, 1988). As well, relationships have been found between stressful life events during pregnancy and diminished family functioning (Mercer, Ferketich, DeJoseph, May & Sollid, 1988; Smilkstein, Helsper-Lucas, Ashworth, Montano & Pagel, 1984), and in addition, to slower progression in maternal role behaviours (Curry & Snell, 1985).

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Social support has been defined as interpersonal relationships that provide reassurance and a sense of one's ability to rely on or confide in another (emotional support); information or advice that assists the individual in problem-solving (informational support); and direct aid or services that convey a message of the person's worth (tangible support) (Schaefer, Coyne & Lazarus, 1981). Social support has been proposed as an important factor that affects health through the adaptation to stressful life events. From this perspective, social support is viewed as a resource that affects health both directly, and, in a less direct manner, by mediating or buffering the relationship between stress and health (Cassel, Kaplan & Gore, 1977; Cobb, 1976; Dimond & Jones, 1983; Norbeck, 1988). Adaptation may be considered an indicator of health and relates to the individual's response to stressors as he or she attempts to adjust or accommodate to the situation in a positive way (Dimond & Jones, 1983). Social support in pregnancy has been linked to maternal role attainment (Mercer, Hackley & Bostrom, 1984), fetal attachment (Cranley, 1984), and adaptation to parenthood (Cronenwett, 1985) in low-risk populations.

In a longitudinal field study of 20 hospitalized women with pregnancies complicated by chronic illness, Corbin (1987) described the management strategies employed by this group of women to deal with imposed situational stressors. Findings indicated that the adequacy of informational support greatly influenced the ability of participants to manage and control their high-risk situations successfully. Adequate emotional support was associated with decreased emotional conflict in making decisions about the pregnancies.

Nuckolls, Cassel and Kaplan (1972) studied the relationship between psycho-social assets, social stresses and the prognosis of pregnancy in 170 primiparous army wives. The category of psycho-social assets combined five qualities including ego-strength, qualities of marriage, relationships with extended family, social resources and feelings about the pregnancy, into a single variable. Neither life change nor psycho-social assets were independently associated with complications. However, when the interaction of life change and psycho-social assets was examined, it was found that, in the presence of high life change, women with low psycho-social assets had a complication rate of 91% as compared to 33% for women with many psycho-social assets. Hence, psycho-social assets may have a buffering effect on stressful life events. However, the interpretation of the study results are limited, as the differential effects of individual aspects of the variable psycho-social assets were not considered.

In a more recent study, Norbeck and Tilden (1983) examined the effects of life stress, social support and emotional disequilibrium on complications of pregnancy in a sample of 117 low-risk pregnant women. Total social support

was not found to be an independent predictor of total complication rate, nor of gestational, labour or infant complications. However, the interaction of tangible support, one type of support considered, and life change was significant for each type of complication.

While there are relatively few studies that have examined the role of social support in pregnancy, existing studies have generally focussed on populations of expectant women with initially normal pregnancies. Only one study was found that examined the relationships between stress, social support, anxiety and depression in women with identified high-risk pregnancies (Mercer & Ferketich, 1988). No studies were found that examined the relationships between stress, social support and adaptation in women with high-risk pregnancies, whether hospitalized or non-hospitalized. The purpose of the present study was to describe the effects of perceived stress and social support on adaptation in a sample of hospitalized antepartum women.

Conceptual framework

Dimond and Jones' (1983) conceptual model of social support and adaptation to stress was used to guide the investigation (Figure 1). Six variables are identified in this model. Solid lines indicate main (direct) effects; broken lines indicate buffering (interactive) effects. While it was acknowledged that each of the variables and hypothesized relationships presented in the model could be important in understanding the role of social support in adaptation, this study was limited to the examination of three variables, the stressor, the perceived adequacy of social support and the adaptive response, as well as the relationships between these variables.

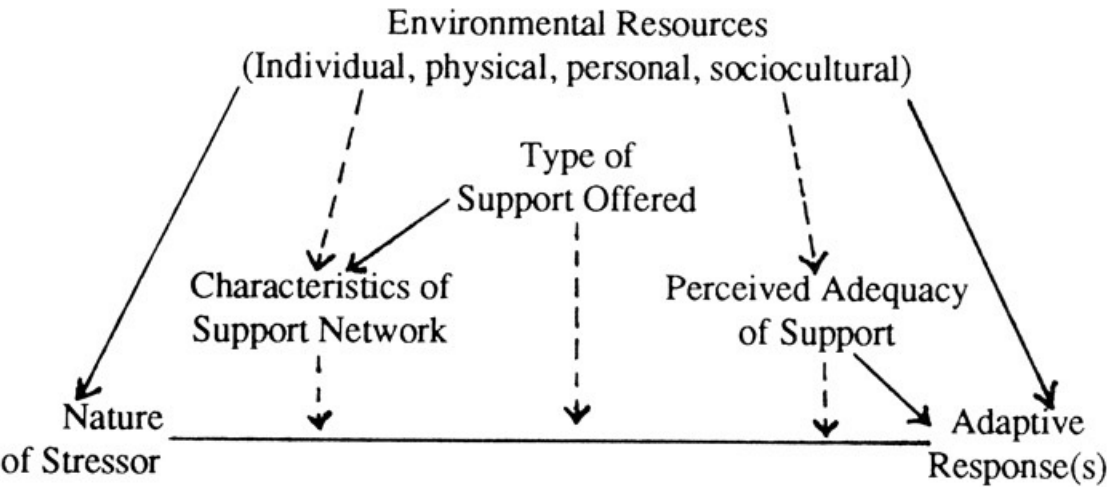


Figure 1
A proposed Model for Social Support and Adaptation to Stress.

Source: Dimond, M. & Jones, S.L. (1983). Social Support: A review and theoretical integration. In P. Chinn (Ed.), *Advances in nursing theory development* (pp. 235-249), Rockville, MD: Aspen.

According to Dimond and Jones (1983), in order for a situation to be stressful, it must be perceived as potentially harmful or overwhelming. The nature of the stressor, then, is defined as the degree of perceived stress experienced by women who are hospitalized for high-risk pregnancies. The nature of the stressor determines the type of adaptive response (Dimond and Jones, 1983). Thus, the greater the perceived stress, the less adaptive the response. In this study, adaptation is defined as the response of women to stressors experienced in antepartum hospitalization, and is operationalized as the degree of perceived adjustment to stressors relative to this situation.

The perceived adequacy of social support refers to the extent to which an individual perceives the environment to be supportive (Dimond & Jones, 1983). Mercer & Ferketich (1988) advise the use of perceived support as opposed to either received support or network size as a more salient dimension of support in pregnancy; perceived support was the only significant predictor of anxiety and depression in their sample of women with low and high-risk pregnancies. In the conceptual framework for this study, the perceived adequacy of social support positively affects the adaptive responses of women both directly, and also indirectly, by buffering the effects of stress.

Hypotheses

Consistent with the conceptual model, three hypotheses were tested.

1. Perceived stress will be negatively related to adaptation.
2. Perceived adequacy of social support will be positively related to adaptation.
3. Social support will have a buffering effect on the relationship between perceived stress and adaptation.

Selected demographic variables were also tested to determine if these represented additional sources of unexplained variance in the adaptation experienced by study participants.

Method

Design

A descriptive, correlational design was used to study the variables of interest.

Sample and setting

A convenience sample of 27 hospitalized, pregnant women was recruited from a regional perinatal center. Women on the antepartum unit who were

experiencing a high-risk pregnancy of 20 to 38 weeks gestation, who had been hospitalized for a 1 to 4 week period, who were emotionally, physically and mentally competent to respond to questions and who were fluent in English were asked to participate in the study. All subjects who were approached agreed to participate and informed consent was obtained. Two women who agreed to participate were excluded from the sample as they were unable to identify stressors relative to their life situations. Interviews were conducted in a quiet room on the antepartum unit and lasted from 30 to 60 minutes.

Measures

Perceived stress was measured on the *Stressors in Antepartum Hospitalization Tool* (SAHT), an instrument designed for the study based upon a previously developed method (Close, 1986; Llewellyn-Thomas et al., 1984a, 1984b). The SAHT is a two-part instrument that elicits information about types and magnitude of stressors experienced by women who are hospitalized antepartum, and, an index of the total amount of perceived stress related to this situation. Findings from Part I, which were derived by asking subjects to use free thought to identify stressors, to a maximum of eight, and then rate each of these on a 100 mm linear analogue scale according to the amount of stress it created, are reported elsewhere (Ford, 1987). In Part II, subjects were asked to consider the total degree of stress they were experiencing from all sources identified in Part I, and rate the degree of perceived stress on a 100 mm linear analogue scale from "no stress" (0) to "the greatest stress imaginable" (100). This score, which represents perceived stress in the present report, was highly correlated with the mean rating from part I ($r=.86$), indicating adequate internal consistency. An index of content validity of 1.00 was established for the SAHT, based upon the consistency of each item with its stated objective, as assessed by two health professionals with expertise in the maternal-child health field (Waltz & Bausell, 1981).

Adaptation was measured on a one-item scale developed by the investigator. Subjects were asked to determine the degree to which they perceived themselves as making a positive adjustment to the stressors previously identified and rate this on a 100 mm linear analogue scale from "not at all" (0) to "completely" (100). An index of content validity of 1.00 was determined in the same manner as outlined for the SAHT. As subjects were asked to indicate their perceptions at the time of the interview, stability across time could not be used as an indicator of reliability; the perceptions of both stress and adaptation depend upon circumstantial factors, which may change frequently in high-risk pregnancy.

Linear analogue scales are frequently used to capture feelings, perceptions and sensations which may be difficult to measure on scales with

predetermined intervals (Lee & Kieckhefer, 1989). Previous research has demonstrated the ease of administration, reliability and validity of this approach (Bond & Lader, 1974; Llewellyn-Thomas et al., 1984a, 1984b; Sutherland, Walker & Till, 1988). In the present study, this method provides a highly sensitive way of describing the subjective experiences of participants.

Perceived adequacy of social support was measured on a six-item scale, the *Social Support Questionnaire* (SSQ), that combined five items developed by Cohen (Schaefer et al., 1981) to measure the adequacy of emotional and informational support, and one item that taps tangible support as adapted from the *Norbeck Social Support Questionnaire* (Norbeck, Lindsay & Carrieri, 1981). Subjects were asked to indicate the degree to which specific individuals in their support network provided emotional, informational and tangible support on a five-point Likert Scale from 1, "not at all" to 5, "extremely". Two sources of support, a significant other and a significant nurse, were rated by study subjects. Total social support was calculated as the sum of each of these two ratings and has a possible range of 12 to 60.

The four questions that measure emotional support on the SSQ have been found to be highly related to one another (average inter-item correlation =.93) and discriminate from both informational and tangible support items (Schaefer et al., 1981). Tilden (1983) reported a coefficient alpha reliability of .98 for the four emotional support items using a convenience sample of 141 women with uncomplicated pregnancies in their second trimester; the alpha coefficient for emotional support items in the present study was .86. The item used to measure tangible support has been reworded for consistency with the SSQ, and is otherwise similar to the tangible support item (Norbeck et al., 1981), which has reported test-retest reliability of .86.

Information regarding occupation, marital status, culture, education, income and previous hospitalization was asked of the subjects. Information regarding medical history including parity, gestation, length of hospitalization, risk category, and diagnosis, as well as age, was obtained from the subject's medical record. The determination of risk was made by the subject's physician using standard guidelines on the Ontario Antenatal Record, where A represents low risk, B represents moderate risk (often sufficient for hospitalization) and C represents high risk.

Data analysis

A correlation matrix of the study variables was constructed using Pearson r correlations (Table 1). The buffering effect of social support (hypothesis 3) was not tested, as no significant relationship was found between perceived stress and adaptation ($r=-0.23$, $p=0.24$) and subjects' scores for adaptation

lacked variability (Table 2). Three-quarters of subjects' scores (n=21) fell above 50. Multiple regression analyses were conducted to explore further the relationships between the combination of perceived stress and social support, as well as selected demographic variables, to adaptation. Forward stepwise multiple regression was employed to determine if length of hospitalization (LOH), income, risk (dichotomized as lower-risk or higher-risk), or age, together with social support and perceived stress, accounted for a significant portion of the variance in adaptation. Categorical variables were transformed into dummy variables for the analysis. Variables were entered into the regression model in order of the strength of the relationship held with the dependent variable, based on a correlation matrix of the variables. The level of significance for this study, determined a priori, was .05.

Table 1

Correlation Matrix of Selected Study Variables

Variables	TSTRESS ^a	TSS ^b	LOH ^c	RISK ^d	INCOME ^e	GEST ^f	AGE ^g	ADJ ^h
TSTRESS ^a	1.00	-0.01	0.27	0.17	-0.32*	-0.07	-0.24	-0.23
TSS ^b	.	1.00	0.13	0.28	0.34*	-0.13	0.15	0.41*
LOH ^c	.	.	1.00	0.16	0.07	-0.24	0.25	-0.35*
RISK ^d	.	.	.	1.00	-0.22	-0.11	-0.36*	-0.22
INCOME ^e	1.00	-0.01	0.50*	0.29
GEST ^f	1.00	-0.04	0.03
AGE ^g	1.00	0.20
ADJ ^h	1.00

^aPerceived stress; ^bPerceived adequacy of social support; ^cLength of hospitalization in days; ^dRisk category of pregnancy; ^eAnnual household income; ^fGestation of pregnancy in weeks; ^gAge of subjects in years; ^hPerceived adaptation.
 *p<.05

Table 2

Ranges, Means, and Standard Deviations of Study Variables

Variable	Actual Range of Scores	<u>M</u>	SD
Perceived stress	18-100	67.03	19.02
Social support	35-57	45.74	6.1
Adaptation	18-99	67.63	31.89

Results

Subjects ranged in age from 17 to 39 years of age ($M=28.9$, $SD=2.1$) and all but four were married. As a group, subjects represented a broad range of cultural backgrounds and were well educated ($M=14.1$ yrs. of education, $SD=2.1$), with approximately 60% possessing a college diploma or university degree. Household income ranged from \$5,000 to \$100,00 per annum ($M=\$48,159$, $SD=\$26,110$).

The majority of subjects were multiparous ($N=23$), although 8 of these 23 subjects had no living children. The gestation of current pregnancies ranged from 24 to 38 weeks ($M=31$, $SD=3.9$). Ten of the pregnancies were classified as lower risk "B", while 17 represented higher risk "C"; one-third of the sample had experienced at least one previous pregnancy loss. Subjects had been hospitalized for an average of 10.4 days (range =7 to 28) and represented a wide range of obstetrical and medical diagnoses including premature rupture of membranes ($N=8$), premature labour ($N=6$), diabetes ($N=5$), antepartum hemorrhage ($N=3$), pregnancy-induced hypertension ($N=3$), incompetent cervix ($N=1$) and acute depression ($N=1$). A sizeable portion of subjects had been hospitalized previously during the current pregnancy (30%) or during a past pregnancy (22%).

While a positive relationship was found between social support and adaptation ($r=.41$, $p=0.04$), no significant relationship was found between perceived stress and adaptation ($r=-.23$, $p=0.24$). Hence, hypothesis 2 was supported by the study findings while hypothesis 1 was not supported.

Results of the multiple regression analyses were as follows. First, the effect of stress and social support on adaptation was examined. The independent variables (perceived stress, social support) were not related to one another ($r=-.01$, $p=0.96$) and were entered separately into the regression model. As social support possessed the strongest relationship with the outcome variable (adaptation), it assumed the first position in the model. With both independent variables entered into the regression model, the overall R^2 was 22%. Social support accounted for 17% of the variance and perceived stress was negatively correlated with adjustment, representing a change in R^2 of 5%. However, the F-to-Remove was small (1.63) and the p-value was non-significant ($p=.21$). Thus, the contribution of perceived stress in the regression model was highly questionable.

Next, analyses were conducted to determine if selected demographic variables represented additional sources of unexplained variance in the model. The model that accounted for the most significant portion of the variance is presented in Table 3. Social support (SS), length of hospitalization (LOH), and risk together accounted for 43% of the variance ($p=0.004$). While the p-

value for the variable risk was not significant at the .05 level, both the F-value and the change in R^2 were significantly large to merit the inclusion of this variable in the model, particularly in light of the small sample size ($N=27$). The final model, then, suggests that subjects in the sample who had greater perceived social support, who had been in hospital for a shorter time when interviewed, and were of lower risk, experienced greater adaptation to stress in antepartum hospitalization. Partial correlations of the other variables (stress, income, gestation, age) were all less than .15 (non-significant). The variable of perceived stress did not significantly contribute to the model when risk was included in the model.

Table 3

***Summary of Stepwise Multiple Regression Analysis:
Predictors of Adaptation in Hospitalized Antepartum Women (N=27)***

Step	Variable entered	Final Step				Cumulative		
		B	SE	F-to-remove	P	R^2	F	P
1	TSS ^a	1.97	0.59	11.06	0.003	0.17	6.63	0.02
2	LOH ^b	-1.42	0.61	5.45	0.03	0.34	6.88	0.02
3	RISK ^c	-14.32	7.38	3.76	0.06	0.43	5.76	0.004

^aTotal social support; ^bLength of hospitalization in days; ^cPregnancy risk

Discussion

The failure of perceived stress to achieve significance as a predictor of adaptation is noteworthy. This finding may be related to the use of perceived stress as an indicator of the stressfulness of antepartum hospitalization, rather than a more objective measure. Previous studies, which utilized life change as a measure of stress, have found significant relationships between stress (life change) and pregnancy complications (Norbeck & Tilden, 1983; Nuckolls, Cassell & Kaplan, 1972). A possible explanation for this effect relates to differences in the timing of data collection. Studies using objective measures of stress also tended to use a prospective approach, such that data regarding stress and the outcome variable were collected at separate intervals. In the present study, data on the study variables were collected during the same interview and, thus, subjects may have experienced difficulty separating the issues. Further, subjects' stress and adaptation scores were based upon their perceptions, and, therefore, were more likely to be influenced by their emotional states at the time of data collection. It is possible that the interview process may have had some beneficial, cathartic effect, such that

subjects perceived themselves to be better adapted following the interview, and conveyed this in their scores for stress and adaptation.

The direct effect of social support on adaptation (hypothesis 2) was supported, as evidenced by a significant correlation between these variables ($r=.41$, $p=0.04$) and by the significant portion of the variance accounted for by social support when entered alone into the regression model. This finding is not surprising in that the importance of social support in low-risk pregnancy has been documented in previous studies (Cranley, 1984; Cronenwett, 1985; Mercer et al., 1984).

While the buffering effect of social support (hypothesis 3) could not be tested, the perceived adequacy of social support was found, in combination with other variables not included in the conceptual model, to influence adaptation significantly. It is particularly noteworthy that the amount of variance in adaptation explained by social support (17%) was substantially greater than the social support effect on emotional disequilibrium reported by Tilden (1983) in her sample of low-risk pregnant women (3%). However, if one accepts the premise that social support is a resource sought after to promote adaptation to stressful life events, then hospitalized pregnant women, who may have an increased need for social support because of their at-risk situations, should benefit to a greater extent from the provision of an adequate level of support than their low-risk counterparts. While the variance in adaptation explained by social support in the present study is considerably less than the effect of social support in reducing complication rate reported by Nuckolls et al. (1972), the results of the latter study should be cautiously considered as social support was treated as one component of a larger variable in the analysis. In the present study, the analysis related to social support was also limited. As the social support instrument used contained only one item for each of the categories of informational and tangible support, the differential effects of types of social support could not be tested.

The presence of length of hospitalization as a variable in the regression model is interesting in light of the fact that the length of hospitalization in this study really reflects a slice in time (i.e. the number of elapsed hospital days when the subject was interviewed, the minimum of which was seven days). Thus, the better adapted subjects in this sample tended to be hospitalized for the minimum period allowed by the study (seven days) with adaptation decreasing as the number of days in hospital increased. As the crisis of admission to hospital has been quite well documented, it is possible that women who are hospitalized antepartum may experience a period of poor adaptation around the time of admission, followed by a period of relative calm and adjustment (perhaps at seven to eight days of hospitalization), and, then a gradual decrease in adaptation as hospitalization progresses (Merkatz, 1976; White & Richie, 1984). This period of stabilization at seven to eight

days may reflect the individual's initial efforts of coping with the crisis of hospital admission, possibly through the use of denial. As the length of hospitalization increases, the woman must face the reality of her at-risk pregnancy and attempt to establish more long-lasting mechanisms for dealing with the stress encountered. This explanation is plausible when one considers that, of the two subjects who were unable to describe stressors, both had been hospitalized for seven days and appeared to rely quite heavily on the use of denial throughout the interview process. Further, some evidence exists that hospitalized antepartum women may experience emotional changes at around eight days hospitalization, that appear to be related to coping with the crisis of hospitalization (Waldron & Asayama, 1985). Regardless, longitudinal studies are needed to document the process of adaptation that occurs over time in this population.

Further, while risk in this study was determined by a grade based on the women's medical status, the interviews provided evidence that this variable also involves a subjective component that relates to the woman's perception of the degree of danger present for the fetus. As such, the subjective meaning of risk to each individual woman may have influenced adaptation in the study sample. The findings of Corbin's (1987) study of women with pregnancies complicated by chronic illness support the premise that women make an appraisal of pregnancy risk that is independent of, and sometimes divergent from, the risk status determined by medical personnel.

Nursing implications

The finding that social support was predictive of adaptation in the study sample has important implications for nursing practice. Nurses should assess the level of support available to individual women from within their own support network. As the woman's support network is often partially or totally disrupted by the physical separation that hospitalization creates, alternative sources of support should be accessible while in hospital. The nurse may coordinate the process of providing social support, by referring the woman and her family to other members of the health care team, such as chaplains and social workers, making patient-to-patient introductions, and, presenting oneself as available to the patient and her family. This coordination may be enacted as part of a formalized, multidisciplinary team that deals specifically with psycho-social aspects of antepartum hospitalization and devises an individualized, coordinated plan of care to assist each antepartum patient in dealing with particular areas of difficulty encountered.

The study findings also suggest that the hospitalized antepartum woman's level of adaptation may decrease as hospitalization progresses. Nurses should be aware of this pattern, but also be constantly alert to individual differences that may exist, so that appropriate support resources may be mobilized in accordance with the antepartum woman's changing needs.

This study involves a number of limitations, including a small, convenience sample and limited testing of the reliability and validity of the measurement tools. A need exists for methodological studies to assess the psychometric properties of these instruments further. In particular, the development of a reliable and valid measure of social support, including several items per subscale, which is suitable for hospitalized pregnant women, would permit more complex statistical analysis of this variable. Subjects in this study represented a somewhat advantaged group of women in terms of education and socio-economic status, yet these women experienced considerable stress. In light of this, serious questions arise as to the experience of less socially-advantaged groups of women related to antepartum hospitalization.

Nonetheless, social support is emerging as an important factor that affects the adaptation of pregnant women. Through assessment of the support available to these women and improvement of their support network when required, nurses may play a significant role in assisting these clients toward adaptation. Further research, with larger, more diverse samples, is required to clarify the relationships between stress, social support and adaptation as they occur over time, and to determine other factors that influence adaptation.

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RÉSUMÉ

Variables prédictives d'adaptation chez des femmes hospitalisées pendant la grossesse

L'expérience subjective de 27 femmes hospitalisées pour une grossesse à risque est décrite en fonction du stress perçu, du soutien social et de l'adaptation. Le modèle conceptuel d'adaptation au stress et de soutien social de Dimond et Jones (1983) a été utilisé dans le cadre de l'étude. Trois hypothèses dérivées du modèle conceptuel qui décrit la relation entre ces variables ont été vérifiées. On n'a noté aucune relation entre le stress perçu et l'adaptation ($r=-0,23$, $p=0,24$). Toutefois, on a observé une association positive entre l'adéquation perçue du soutien social et l'adaptation ($r=0,41$, $p=0,04$). La combinaison du soutien social, de la durée de l'hospitalisation et du risque que présentait la grossesse s'est révélée une valeur prédictive importante de l'adaptation: c'est ainsi que les femmes qui bénéficiaient du plus grand soutien social, dont la durée d'hospitalisation était la plus courte au moment de l'entrevue et dont la grossesse comportait par ailleurs le moins de risques affichaient le plus haut niveau d'adaptation. Ces observations portent à croire qu'une hospitalisation avant l'accouchement est une expérience stressante; le soutien social est une ressource importante qui influe sur l'adaptation.