Explanatory model of health in bereaved parents post-fetal/infant death

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Abstract

In order to identify which features contribute to attenuating or intensifying the deleterious consequences of a perinatal loss such that some family systems endure and sometimes even thrive when faced with such a situational stressor, while other family units seem to deteriorate and disintegrate under similar circumstances, an explanatory model of health was tested. The purpose of this longitudinal study was to examine how the relationships between the elements in the model namely: resources both internal (hardiness) and external (marital and social supports), as well as appraisal of the situation, predicted the health of 110 bereaved couples (husbands and wives).

Keywords: Perinatal loss; Parental bereavement; Hardiness; Marital satisfaction

1. Introduction

The death of a fetus/infant has a significant impact on many aspects of the health of bereaved couples. Researchers have tended to focus on the deleterious outcomes of the physical and psychological health and well-being of each spouse (Smith and Borgers, 1989; Theut et al., 1989) and on present and future family relationships (Gilbert, 1989; Schwab, 1992). Parental grief is particularly severe, long lasting, and complicated with symptoms that fluctuate over time (Rando, 1986; Zeannah et al., 1995). One of the most difficult aspects of parental bereavement is that the death strikes both partners in the marital dyad simultaneously and confronts them with an overwhelming sense of loss.

There is suggestive evidence that the differences in the way husbands and wives grieve and perceive the situation can result in misunderstandings. These misunderstandings can affect their family functioning as well as the couple’s marital relationship and thus decrease each other’s ability to be a primary source of support for the other (Gilbert, 1989; Gottlieb et al., 1996; Lang and Gottlieb, 1991; Mekosh-Rosenbaum and Lasker, 1995). This difficult situation has temporal implications in that the bereavement process and the deleterious consequences of the loss will be felt throughout the parents’ lifetime. Yet in contrast, some parents report that they were able to make sense of their own existence following such a tragedy. Their loss had brought them closer together and strengthened their marital relationship (Gilbert, 1989; Gottlieb et al., 1994).

The persistent question of why some family systems endure and sometimes even thrive when faced with normative transitions or situational stressors, while other family units seem to deteriorate and disintegrate under similar circumstances is quintessential to nursing.

The contextual model of family stress (CMFS) (Boss, 2002) is a dynamic and useful theoretical framework for family research and theory development in times of...
significant stress or important life transitions. This middle-range theory identifies variables such as individual and family resources and emphasizes the importance of perceptions and meaning of the situation as determinants of health (Fig. 1). Health is a multidimensional concept that has been defined and measured in a number of ways. From a nursing perspective of health promotion, health is intimately connected to the family system, which is recognized as the context in which individuals learn about health and as such, is considered the unit of nursing intervention (Feeley and Gottlieb, 2000). In order to predict the health of bereaved parents following the death of their fetus/infant this study empirically tested the relationships between resources both internal (hardiness) and external (marital and social support), perception of the event, and health following a perinatal loss, based on the CMFS and displayed in Fig. 2.

2. Literature review

In Canada, the cumulative annual incidence of stillbirths and perinatal deaths is 10.1 per 1000 births (Statistics Canada, 2001). There are no published statistics on the demise of fetuses prior to 20 weeks gestation or who weigh less than 500 g even though it is estimated that 15–20% of pregnancies end in miscarriage (Johnson and Puddifoot, 1996; Seibel and Graves, 1980).

Empirical studies have revealed the deleterious effects that the death of a fetus/infant can have on the health of parents and their relationship with each other (Lang et al., 1996; Mekosh-Rosenbaum and Lasker, 1995; Zeanah et al., 1995). Although, the exact situational and personal characteristics that can attenuate or intensify the deleterious consequences have yet to be identified, personal resources such as hardiness (Duquette et al., 1995; Kobasa et al., 1982; Schaefer and Moos, 1998) may mitigate the impact of unexpected and important stressors like the death of a fetus/infant (Affleck and Tennen, 1996; Campbell et al., 1991; Tennen and Affleck, 1998). When confrontation is unavoidable the harder person may appraise the situation differently, is more inclined to seek out change, is able to work through the negative effects of stress, and can actually experience personal growth in the face of adversity (Kobasa et al., 1982; Lang et al., 2001; Maddi et al., 2002).

The literature also suggests that support protects against psychological distress in stressful situations (Rubin and Malkinson, 2001) and mediates some of the stress of important life transitions (Schaefer and Moos, 1998). Thus, marital and social supports are both potentially important although it is unclear what role each plays following the loss. It is postulated in this study that hardier individuals will evaluate, seek, and use the supports available to them more efficiently and that their satisfaction with its adequacy will alter their appraisal of the situation. Furthermore, lack of perceived support will affect the entire experience and may jeopardize the health of individuals.

Anecdotal accounts from bereaved parents suggest that their appraisal of the situation and the meaning that each individual places on the life and death of their fetus/infant colors the remainder of their bereavement process (Gilbert, 1989; Schwab, 1996). Moreover, empirical data from studies dealing with how patients appraise their illness (Fife, 1995) and how family members of patients appraise the illness (Carey et al., 1991) provide support for the relationship between appraisal and adaptation for patients and family members.

There has been speculation regarding why some marriages remain intact and even grow whereas others deteriorate. The most common explanation relates to the nature, intensity, and trajectory of each partner’s grieving process as well as their perception of availability of social and marital supports (Gottlieb et al., 1996; Schwab, 1996). Although gender differences in parental

![Fig. 1. Boss’ contextual model of family stress.](image1)

![Fig. 2. Explanatory model of health in bereaved parents post-fetal/infant death.](image2)
responses to bereavement have been described family functioning has yet to be measured in this population.

In this study, health is conceptualized as an amalgam of indicators consisting of individual grief reactions, marital satisfaction, and family functioning, which can all be affected by the bereavement experience. Although, we have yet to establish what proportion of differences between bereaved parents’ grief is due to sensitivity and specificity of measurements, there is general agreement that disparity can place additional strain on family members’ health and relationships.

There are several limitations to the few existing studies. Research studies that have examined the effects of gestational age or type of loss on parents have yielded conflicting results. For example, some studies suggest that parents who experience an early loss (miscarriage or ectopic pregnancy) report less intense grief reactions than parents who experience a late loss (stillbirth or neonatal) (Goldback et al., 1991; Theut et al., 1989) whereas others report that the reaction to the loss is just as great in the case of miscarriage, neonatal, or infant death (Lang, 1990; Zeah et al., 1995). Most research-ers have focused on the deleterious effects on only the mothers, combining into one cohort those who had lost their baby anywhere from a few weeks to more than 30–40 yr earlier (Schwab, 1990; Smith and Borgers, 1989). In addition, these studies used small convenience samples, recruited predominantly from support groups and thus, were not necessarily representative of bereaved parents. Until now, investigators have not used a theoretical model to study this phenomenon in a longitudinal fashion: to examine over weeks and months the relationship between bereaved couples’ resources both internal (hardiness) and external (marital and social support), appraisal of the situation, and ultimately their health. Why some bereaved parents emerge feeling stronger following the death of their fetus/infant has yet to be examined. This study tested an explanatory model of health by examining how the relationships between hardiness, satisfaction with marital and social supports, and appraisal of the situation predict the health of bereaved parents (husbands and wives) following the death of their fetus/infant. The effect of time on the initial model was also examined and validated in the same participants following their loss.

3. Hypotheses

H1: Bereaved parents who score higher on hardiness, are more satisfied with their marital and social support, and have a more positive appraisal of the situation have a higher health index.

H2: Bereaved parents who score higher on hardiness at baseline (T1), are more satisfied with their marital and social supports at T2/T3, and have a more positive appraisal of the situation at T2/T3 have a higher health index at T2/T3.

H3: There are differences between the models of health for bereaved mothers and bereaved fathers; accordingly, there are also differences in mothers and fathers’ scores on satisfaction with marital and social supports, appraisal of the situation, and health at T1/T2/T3.

4. Method

With a power of 0.80 and a 0.05 risk of Type I error and assuming a moderate effect size (r ≥ 0.30) and the number of independent variables, the sample size required was 107 couples (Cohen, 1992). In all, 110 couples participated at T1 (2 months post-loss). With great effort, attrition was relatively low (Dyregrov and Dyregrov, 1999; Hayslip et al., 1999) with only 13% (n = 96) at T2 and a final 21% attrition resulting in 87 couples remaining at T3. Despite this rate of attrition, power in this study was maintained at 0.80 and very close to a moderate effect size at T3. Participants were recruited from seven Montreal area university hospitals following scientific and ethical approval at each institution. Couples that experienced the loss of a baby (in pregnancy and/or the first year of life) within the previous 2 months were 18 yr of age or older, living together within a 60 km radius of Montreal, and were able to read and understand French or English were visited in their home at 2 months (T1), 6 months (T2), and 13 months (T3) post-loss by an experienced nurse researcher with training. After signing their respective consent form, both parents simultaneously and independently completed six questionnaires during each visit.

4.1. Characteristics of the study sample

The socio-economic status of these 220 participants is comparable to other bereavement studies. Mothers’ ages ranged from 19 to 43 yr with a mean of 31.5 yr (SD = 4.8), while fathers’ ages ranged from 20 to 47 with a mean of 33.7 yr (SD = 5.4). Couples had been married or living together from less than 1 to 23 yr (M = 6.4 yr, SD = 4.3). More than 45% had completed a university education while 50 (23%) listed their high school diploma as the highest level of education completed. The average annual family income, which ranged from less than $20,000 to over $80,000 (Canadian), was $56,809 with the median around $70,000. Slightly less than half of the couples were French Canadian. Ten percent were English Canadians while nearly one-third were “other” Canadians, a mélange from various ethnic backgrounds (i.e., Greek, Italian, Lebanese, and Chinese). Thirteen percent were immi-
grants who had recently arrived in Canada from around the globe (i.e., Europe, Africa, South America, and Haiti). This diverse ethno-cultural palate, which reflects the current Canadian mosaic in Montreal contrasts with bereavement studies reported in the literature.

Approximately half of the deaths were within the first trimester, nearly one quarter were stillborn after 13 weeks gestation, while more than 25% of the babies died after delivery. None of these were terminated voluntarily. Nearly 40% of couples had experienced a previous perinatal loss and more than half (n = 58) had other children at the time of the first home visit. Of the 110 couples, 16% of husbands and 15% of wives had considered separating before the loss. This rate decreased for both spouses by approximately half, 2 months after the loss. Participants and decliners did not differ significantly on their level of education, the number of children, or previous losses. Nonetheless, couples that completed T3 had a higher family income and were less likely to have previously experienced a perinatal loss than those lost to attrition.

5. Measures

All of the instruments in this study were available to participants in either French or English.

5.1. Lang and Goulet hardness scale

Based on a concept analysis (Lang et al., 2001), this new instrument developed specifically for this study, measures the three attributes of hardness, namely sense of personal control (16 items), active orientation (13 items), and making sense (16 items), as an amalgam (Lang et al., 2003). Internal consistency yielded a Cronbach’s alpha coefficient estimate ranging from 0.65 to 0.72 for the subscales and 0.84 for the total 45 items. The Lang and Goulet hardness scale (LGHS) showed good convergent and discriminant validity while test–retest reliability conducted on 192 subjects (96 mothers and 96 fathers) at T3 (6 months) was 0.73 for fathers and 0.76 for mothers (Lang et al., 2003). The 45 items, which can be completed in 7 min, were rated on a five-point Likert scale. The theoretical score ranged from 45 to 225; a high score indicated a high degree of hardness.

5.2. Support behaviors inventory

Based on House’s (1981) conceptualization, Brown’s (1986) development of the support behaviors inventory (SBI) includes items that pertain to emotional, instrumental, informational, and appraisal support behaviors. Internal consistency assessed using Cronbach’s alpha coefficient estimates, yielded 0.97 for spousal support and 0.98 for other support (Goulet et al., 1996). The correlation coefficient reported between the two subscales of partner and other support was 0.44, suggesting a moderate relationship. The presence of one type of support cannot be counted on to serve as a marker for the other. These 11 items, six-point Likert scale, measured spousal support separate from other social support. The theoretical score ranges from 11 to 66 for each of the subscales. A high score indicates a high degree of satisfaction with that source of support. It can be completed in 5 min.

5.3. Family adaptability and cohesion evaluation scale

Developed to measure cohesion and adaptability in families, this family functioning instrument consists of 30 items rated on a five-point Likert scale in which each spouse rated how he or she perceives their family. It yields a total score that is a global reflection of the family’s resources. It is considered a linear measure with higher scores representing well-functioning families and lower scores representing poorly functioning families (Olson and Tiesel, 1991). In addition to good convergent validity, the alpha coefficient of internal consistency was 0.78 for adaptability, 0.87 for cohesion, and 0.90 for the total measure. Test–retest reliability reported for a 4–5-week interval on family adaptability and cohesion evaluation scale (FACES II) was 0.80 for adaptability and 0.83 for cohesion (Olson and Tiesel, 1991). It takes less than 7 min to complete.

5.4. ENRICH marital satisfaction scale

Measuring couples’ marital satisfaction this 15 items scale is comprised of 10 items of marital satisfaction and five items for idealistic distortions (Fowers and Olson, 1993). Items were rated on a five-point Likert scale. The theoretical score ranged from 45 to 75. A high score indicated greater marital satisfaction. Alpha coefficient estimates revealed an internal reliability of 0.86. Test–retest assessed with 115 individuals over a period of 4 weeks yielded a reliability coefficient of 0.86. The ENRICH marital satisfaction scale (EMSS) showed good convergent and construct validity (Olson and Tiesel, 1991). It can be completed within 5 min.

5.5. Subjective appraisal ratings of stressors

This instrument assessed cognitive appraisal components of a specific potentially stressful event in terms of negative consequences, positive consequences, loss, danger, failure, challenge, control, coping capability, unknown, and importance (Fillion et al., 1996). It consisted of 10 items rated on an eight-point Likert scale. Alpha coefficient estimates revealed internal reliabilities of 0.81 (impact) and 0.75 (mastery).
Test–retest reliability was assessed with 118 HIV seropositive individuals over a period of 2 weeks: the reliability coefficient was 0.60 (impact) and 0.50 (mastery) (Fillion et al., 1996). Only moderate to high correlations were expected given that cognitive appraisal is defined as a situational variable and not a stable construct. The subjective appraisal ratings of stressors (SARS) shows good concurrent validity (Horowitz et al., 1979). Conceptually, when one appraises a situation its impact and the individual’s perception of their ability to master the situation are both considered. Thus, for this study the subscales were combined, resulting in a total score. Theoretically, the scores range from 10 to 80 with higher scores representing a more positive appraisal of the situation. It can be completed in 3 min.

5.6. Perinatal grief scale

Developed for research on perinatal loss this instrument reflected dimensions such as anger, guilt, depression, and preoccupation with the loss (Toedter et al., 1988). A comprehensive and reliable short version was used consisting of 33 items equally divided amongst three subscales active grief, difficulty coping, and despair all rated on a five-point Likert scale (Potvin et al., 1989). Theoretically, the scores range from 33 to 165 with a higher score reflecting higher grief. Alpha coefficient estimates ranged from 0.86 to 0.92 for each of the three subscales and 0.95 for the total scale. In a recent international comparison of 22 studies that used the perinatal grief scale (PGS) it was noted that regardless of language, type and size of sample, or type of loss, the coefficient for the total PGS scores ranged from 0.92 to 0.96. The average subscale coefficients are 0.92 for Active Grief, 0.89 for Difficulty Coping, and 0.88 for Despair (Toedter et al., 2001). Test–retest reliability over a 12–15 months period for the total scale and the three subscales were significant but not as high as the initial internal reliability, ranging from 0.59 to 0.66. This was expected, given the anticipation that the level of grief would diminish at a variable rate over time. It can be completed within 10 min.

5.7. Hypothesis testing

Separate multiple regressions (MRs) were conducted at each time period in order to test the model. A health index was derived by combining the z-scores of grief reactions (PGS), marital satisfaction (EMSS), and family functioning (FACES II), for mothers and fathers as individuals and then as a couple. The composite health index was the dependent variable on which hardiness, marital and social support, and situational appraisal were regressed. In addition, variables that showed a consistent pattern of relationship to the dependent variables across time periods for both spouses were included as covariates in the model. There were only two such variables namely: (a) consideration of marital separation and (b) the age of the baby at the time of death.

Criteria for acceptance of an independent variable into the regression include: (a) an overall F significant at $p < 0.05$; (b) a test of unique variation, which explains at least 5% of the variance and a part correlation coefficient significant at $p < 0.05$; or (c) a Pearson correlation with the dependent variable that explains at least 5% of the variation and is significant at $p < 0.05$.

In order to assess whether hardiness at baseline, soon after the loss (T1), was related to the spouses’ health or whether it was hardiness at the time of subsequent contacts that was more indicative, both were entered into the regressions at T2 and T3. Thus, in total there were eight independent variables. Separate equations were computed for mothers and fathers individually, and subsequently combined for the couple. Hardiness measured at baseline T1 (2 months) and at present T2 (6 months) and T3 (13 months), marital and social supports, as well as situational appraisal scale were regressed on health. A comparison of the regression models on health was made between mothers and fathers over time. To further address potential differences between mothers and fathers, a repeated measures two factors analysis of variance (ANOVA) was conducted with time and gender as the within subject factors for each of variables in the model. At T1 mothers and fathers were compared on the LGHS, SBI, SARS, PGS, EMSS, and FACES II.

6. Results

6.1. Hypothesis 1

A statistical model was built using MRs. As seen from Fig. 2, part of this explanatory model of health relates to the relationships among resources, both internal (hardiness) and external (marital and social support) and perception of the event (situational appraisal). Hence, prior to running the analyses on the complete model with Factor X (health) as the outcome variable, separate regressions were run on Factor B and Factor C of the model. With the exception of underscoring that in general hardiness was a consistent and strong predictor regardless of the outcome variable, results of these regressions are reported elsewhere (Lang, 2002).

For mothers, the model explained 47% of variance (Table 1). The largest unique contribution to their model of health was made by hardiness (Part $r = 0.43$) followed by marital support (Part $r = 0.31$) and social support (Part $r = 0.16$). Mothers with higher hardiness scores who were more satisfied with their marital and social supports had a higher health index. Appraisal of
the situation did not offer a unique contribution to the model for mothers. Nonetheless, the significant zero-order correlation confirmed that situational appraisal was a predictor of mothers’ health. Those who had a more positive appraisal of the situation were not part of a couple that had considered separation scored higher on health.

For fathers, the percent of variance explained by the model was a comparable 46% (Table 2). The largest unique contribution to the model for fathers was made by marital support (Part $r = 0.32$) and hardiness (Part $r = 0.20$). Those who scored higher on hardiness and were more satisfied with their marital support had a higher health index. Although, neither social support nor situational appraisal provided a unique contribution, the significant zero-order correlations confirmed their value as predictors of health in the model. Fathers who were more satisfied with their social support and had a more positive appraisal of the situation had a higher health index. Being part of a couple that had considered separating also predicted fathers’ health. Those who were not part of such a couple scored higher on health. The age of the baby was not a predictor of health for either parent. Finally, when the variables were combined, the couples’ model explained a sizeable 54% of the variance. Although, the amount of contribution for each of the respective elements varied in the couples’ model of health, compared to the individual models, the general portrait remained intact. Thus, the first hypothesis was accepted.

### 6.2. Hypothesis 2

To address this hypothesis pertaining to time, in addition to entering the baseline hardiness score at T1, hardiness T2/T3, marital and social support T2/T3, and situational appraisal T2/T3 were entered into their respective regressions at each time as well as baby’s age at the time of its demise and whether the couple had considered separation. For bereaved mothers, in addition to the sizeable proportion of variance explained by the model, their $R^2$ increased after T1. With the exception of the age of the baby, almost all of the elements of the model persisted and helped to explain the health of mothers, with hardiness and marital support remaining the most important predictors across time. A third feature was that situational appraisal and consideration of marital separation were no longer predictors of mothers’ health at T3.

Comparably for fathers, the variance explained by the model also increased after T1. With the exception of the age of the baby, almost all of the elements of the model persisted in explaining, across time, the health of fathers. Furthermore, both hardiness and marital support remained as the most important predictors of fathers’ health. Those who scored higher on hardiness at baseline (T1) were more satisfied with their marital and social support at T2/T3, had a more positive appraisal of the situation at T2/T3, and were not part of a couple that had considered separating, had a higher health index across time. Only at T3 was baby’s age a predictor of fathers’ health. Fathers who lost their baby during the first trimester had a higher health index than those whose baby was born alive. Finally, this time comparison revealed that the variance explained by the couples’ model also increased after T1, ranging from 54% to as high as 70% (Table 3). Thus, the second hypothesis was also accepted.

### 6.3. Hypothesis 3

Comparisons, yielded by MR of mothers and fathers’ predictors at all three data collection points, revealed a more similar rather than discordant result. Thus, the third hypothesis was partially rejected (Table 4). This comparison revealed that the amount of variance explained by the model was sizeable and comparable

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**Table 1**

Multiple regression of predictor variables for mothers’ health T1 ($N = 110$)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>r</th>
<th>Part r</th>
<th>$R^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardiness</td>
<td>0.59</td>
<td>0.43***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital support</td>
<td>0.42</td>
<td>0.31***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>0.23</td>
<td>−0.16**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situational appraisal</td>
<td>0.37</td>
<td>0.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy age 1$^a$</td>
<td>ns$^c$</td>
<td>ns$^c$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy age 2$^b$</td>
<td>ns$^c$</td>
<td>ns$^c$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Considered separation</td>
<td>0.19</td>
<td>0.02</td>
<td>0.47</td>
<td>26.55***</td>
</tr>
</tbody>
</table>

**Table 2**

Multiple regression of predictor variables for fathers’ health T1 ($N = 110$)

<table>
<thead>
<tr>
<th>Predictor</th>
<th>r</th>
<th>Part r</th>
<th>$R^2$</th>
<th>F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardiness</td>
<td>0.46</td>
<td>0.20***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital support</td>
<td>0.56</td>
<td>0.32***</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social support</td>
<td>0.32</td>
<td>0.08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situational appraisal</td>
<td>0.32</td>
<td>0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy age 1$^a$</td>
<td>ns$^c$</td>
<td>0.17**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dummy age 2$^b$</td>
<td>ns$^c$</td>
<td>ns$^c$</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Considered separation</td>
<td>0.34</td>
<td>0.16**</td>
<td>0.46</td>
<td>25.58***</td>
</tr>
</tbody>
</table>

**p<0.01, ***p<0.001.**

$^a$Difference between <13 weeks and live births.

$^b$Difference between stillbirths >13 weeks and live births.

$^c$Nonsignificant.
Table 3
Comparison of predictor variables for couples’ health at T₁, T₂, T₃

<table>
<thead>
<tr>
<th>Predictor</th>
<th>T₁ (n = 110) Zero-order r</th>
<th>T₂ (n = 96) Zero-order r</th>
<th>T₃ (n = 87) Zero-order r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardiness (H) T₁</td>
<td>0.33</td>
<td>0.26</td>
<td>0.28</td>
</tr>
<tr>
<td>Hardiness (W) T₁</td>
<td>0.54</td>
<td>0.41</td>
<td>0.46</td>
</tr>
<tr>
<td>Hardiness (H) T₂/T₃</td>
<td>0.36</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Hardiness (W) T₂/T₃</td>
<td>0.54</td>
<td>ns</td>
<td></td>
</tr>
<tr>
<td>Marital support (H)</td>
<td>0.49</td>
<td>0.64</td>
<td>0.56</td>
</tr>
<tr>
<td>Marital support (W)</td>
<td>0.46</td>
<td>0.55</td>
<td>0.50</td>
</tr>
<tr>
<td>Social support (H)</td>
<td>0.27</td>
<td>0.41</td>
<td>0.32</td>
</tr>
<tr>
<td>Social support (W)</td>
<td>0.30</td>
<td>0.47</td>
<td>0.40</td>
</tr>
<tr>
<td>Situational appraisal (H)</td>
<td>0.31</td>
<td>0.32</td>
<td>0.30</td>
</tr>
<tr>
<td>Situational appraisal (W)</td>
<td>0.33</td>
<td>0.34</td>
<td>ns⁺</td>
</tr>
<tr>
<td>Dummy age 1a</td>
<td>ns⁺</td>
<td>0.22</td>
<td>ns⁺</td>
</tr>
<tr>
<td>Dummy age 2b</td>
<td>ns⁺</td>
<td>ns⁺</td>
<td>ns⁺</td>
</tr>
<tr>
<td>Considered separation</td>
<td>0.32</td>
<td>0.35</td>
<td>0.27</td>
</tr>
</tbody>
</table>

R² = 0.54  R² = 0.70  R² = 0.60

⁺Difference between <13 weeks and live births.
⁻Difference between stillbirths >13 weeks and live births.
⁻Nonsignificant.

for mothers and fathers and that it increased after T₁ for both parents. Indeed, only two notable differences were identified in this parent and time comparison. The first was that age of the baby at the time of death was a predictor only for fathers’ health and only at T₂. The second was that situational appraisal and being part of a couple that had considered separation were no longer predictors for mothers’ health at T₃. Otherwise, mothers and fathers had a higher health index across time when they scored higher on hardiness at baseline (T₁), were more satisfied with their marital and social support at T₁, T₂, and T₃, had a more positive appraisal of the situation at T₁, T₂, and T₃, and were not part of a couple that had considered separation. Hardiness, particularly at baseline (T₁), was a consistent and critical predictor of health for mothers and fathers, both as individuals and as a couple at T₁, T₂, and T₃.

To further test for differences between parents in predictor and outcome variables at all three times, each of the model variables was subjected to a 3 × 2 repeated measures ANOVA with time and gender as the repeated measures factors. For hardiness there was a significant main effect of time that increased in a linear fashion F(1, 85) = 9.56, p < 0.01. For marital support, there was significant effect of gender. Fathers were more satisfied with their marital support than were mothers (M = 57.88 vs. M = 56.32). Similarly there was a significant effect of gender on social support. However, in this case it was mothers who were more satisfied with their social network than were fathers (M = 51.83 vs. M = 47.02). There were main effects of gender and time for situational appraisal. Overall, fathers had a more positive appraisal of the situation than did mothers (M = 49.66 vs. M = 45.98). Situational appraisal increased in a linear fashion F(1, 82) = 10.12, p < 0.01, over time as mother and fathers’ appraisal of the situation became increasingly positive. Finally, for grief reactions there was an interaction effect of time × gender that reflects a difference in the linear trend F(1, 85) = 4.70, p < 0.05 of the way that mothers and fathers’ grief reactions changed over time; the rate of decrease for fathers was lower than for mothers. Indeed, the intensity of mothers’ grief at T₃ was at the same level as fathers’ grief at T₁ and the decrease for mothers between T₁ and T₂ was greater than for fathers. The main effects for time and gender were also significant. Overall mothers rated their grief reactions higher than did fathers (M = 71.99 vs. M = 60.11) and there was a general diminution in intensity over time (T₁: 71.99 vs. T₂: 64.72 vs. T₃: 61.44).

7. Discussion
The Explanatory Model of Health in Bereaved Parents Post-Fetal/Infant Death provides empirical support for Boss’ (2002) CFMS. It is a model that focuses on individual and couple strengths rather than on the deleterious consequences of such a loss, which have predominantly been the emphasis of previous studies. However, in contrast to the CMFS that propounds perception of the event as the key variable, resources, both internal (hardiness) and external (marital and social support), emerged as the leading and consistent predictors of health for both parents. Together with hardiness, satisfaction with marital and
social supports were predictive of how bereaved parents appraised the situation and ultimately their health regardless of the age of the baby at the time of death. Thus, without the lens of personal resources or appraisal of the situation firmly in place, preconceived notions by health care professionals or society at large about the impact that the death of a fetus/infant can have on parents’ health and their relationships, based exclusively on the parent’s gender or the age the baby at the time of death, would be misleading.

In addition to being equally applicable to both mothers and fathers, the robustness of the model was evident across time. Although, the remarkable similarity between the health models contrasts with most of the parental grief literature (Lang and Gottlieb, 1993; Lang et al., 1996; Schwab, 1996) it is consistent with two studies. One yielded concordance in coping strategies between parents following the death of their infant (Feeley and Gottlieb, 1988) and another reported that the differences between fathers and mothers seemed to dissolve 12–15 yr following death of their baby to SIDS (Dyregrov and Dyregrov, 1999). This concordance highlights the importance not only of caring for fathers with the same attention awarded to mothers but also the importance of caring for the marital and family units.

7.1. Elements of the study model

7.1.1. Hardiness

Although discussed theoretically by a multitude of authors from various disciplines, this is the first empirical longitudinal evidence from bereaved parents, both as individuals and as a couple, to support the importance of hardiness within this model. These results reinforce the necessity of understanding and assessing hardiness when seeking to understand, explain, and possibly predict the health of individuals and couples following a transforming event such as the death of their baby. Hardiness emerged as a consistent and important predictor of health. Its strength and endurance at baseline (T1) in particular, makes it a pivotal element of the model for bereaved parents, both as individuals and as a couple. It is assumed that each individual demonstrates some degree of hardiness, which may be more or less evident, depending on the situation and the timeframe (Lang et al., 2001). Couples who elected to participate in this study may be harder than those who refused. Perhaps these participants have, over their life span, been adept at drawing on this resource and thus have a greater sense of personal control, active orientation, and are able to make sense of the situation, which as an ensemble, contributed to their propensity to be healthy as well as to participate and remain in this study.

A significant main effect of time on hardiness suggests that the LGHS (Lang et al., 2003) was sensitive enough to pick up changes and that hardiness is not a personality trait but rather a personal resource, potentially amenable to change (Maddi et al., 2002; Ouellette, 1993) and thus could be learned. This has particular relevance to nurses and other clinicians who intervene in hopes of diminishing vulnerability while optimizing the health of bereaved families. Intervention studies reported in the literature suggest that subjects undergoing hardiness training increased not only in hardiness but also in job satisfaction while also decreasing the signs of strain (Maddi, 1987; Maddi et al., 2002). These results were generally greater than relaxation/meditation training and a placebo/social support control (Maddi et al., 1998).

### Table 4
Comparison between predictor variables for mothers and fathers’ health at T1, T2, T3

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Mothers T1 (n = 110)</th>
<th>Mothers T2 (n = 96)</th>
<th>Mothers T3 (n = 87)</th>
<th>Fathers T1 (n = 110)</th>
<th>Fathers T2 (n = 96)</th>
<th>Fathers T3 (n = 87)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardiness T1</td>
<td>0.59</td>
<td>0.47</td>
<td>0.52</td>
<td>0.46</td>
<td>0.39</td>
<td>0.38</td>
</tr>
<tr>
<td>Hardiness T2/T1</td>
<td>0.66</td>
<td>ns</td>
<td>0.54</td>
<td>0.54</td>
<td>ns</td>
<td>ns</td>
</tr>
<tr>
<td>Marital support</td>
<td>0.42</td>
<td>0.54</td>
<td>0.57</td>
<td>0.56</td>
<td>0.67</td>
<td>0.66</td>
</tr>
<tr>
<td>Social support</td>
<td>0.23</td>
<td>0.47</td>
<td>0.41</td>
<td>0.32</td>
<td>0.37</td>
<td>0.33</td>
</tr>
<tr>
<td>Situational appraisal</td>
<td>0.37</td>
<td>0.44</td>
<td>ns c</td>
<td>0.32</td>
<td>0.32</td>
<td>0.35</td>
</tr>
<tr>
<td>Dummy age 1 a</td>
<td>ns e</td>
<td>ns e</td>
<td>ns e</td>
<td>ns e</td>
<td>0.24</td>
<td>ns e</td>
</tr>
<tr>
<td>Dummy age 2 b</td>
<td>ns e</td>
<td>ns e</td>
<td>ns e</td>
<td>ns e</td>
<td>ns e</td>
<td>ns e</td>
</tr>
<tr>
<td>Considered separation</td>
<td>0.19</td>
<td>0.22</td>
<td>ns e</td>
<td>0.34</td>
<td>0.37</td>
<td>0.26</td>
</tr>
</tbody>
</table>

R² = 0.47

R² = 0.58

R² = 0.54

R² = 0.46

R² = 0.65

R² = 0.54

a Difference between <13 weeks and live births.
b Difference between stillbirths >13 weeks and live births.
c Nonsignificant.
It is unclear how much of an increase can be expected over time given the paucity of data on hardiness, particularly in this population. It would be necessary to compare this cohort to different groups who are experiencing various stresses or life transitions in order to eventually establish some hardiness norms. Furthermore, the increase over time may denote the natural progression of this particular personal resource in the general context of life. The fact that there were no significant differences in the health of couples that completed T3 compared to those lost to attrition, lends support to the notion of a natural progression of hardiness. It may also be that an important event, be it positive or negative, potentiates hardiness over time.

7.1.2. Marital and social support
Consistent with the literature (Edwards et al., 1998), marital and social supports were important predictors of health for bereaved mothers and fathers both individually and as a couple over time. It may be that parents who scored higher on hardiness may have had a greater propensity to evaluate, seek, use, and be satisfied with the support available to them. Their perception of its adequacy may have altered their appraisal of the situation and their ability to attribute meaning not only to the critical event but also to their relationship with each other and their evolving social network.

Social resources may enable individuals to muster effective strategies to manage and to redefine an event in a more positive light (Frasure-Smith et al., 2000; Stroebe and Schut, 2001). By influencing behavior and fostering successful adaptation to life crises, social resources may be precursors of personal growth (Schaefer and Moos, 1998). A lack of perceived support affects the entire experience and may jeopardize the health of individuals who are unable to draw on their resources (Lambert et al., 1989). Being part of a couple who had considered marital separation either before or since the loss was also associated with a lower rating of marital support than those who had never considered separating. The couples in this study seem to have pulled together and helped each other through this very difficult time as reflected by their rating of marital satisfaction and family functioning over the 13 months as well as the dwindling number of both mothers and fathers who considered marital separation by T3. It may be that couples that participated were harder and enjoyed stronger marriages and families or those 13 months might be too short a time span to detect any such changes.

7.1.3. Situational appraisal
To date, there has not been any research found on the role of appraisal in relation to personal resources within the context of parental bereavement. This study revealed that hardiness is a predictor of situational appraisal for parents, both as individuals and as a couple. It may be that bereaved parents with higher hardiness scores were more satisfied with their marital and social supports and thus able to deal with aspects of the stressful situation in a manner that modified their appraisal of the situation and which in turn influenced their health. The data from this study are consistent with reports that men and women with more personal and social resources are less likely to appraise a life crisis as a threat and more likely to rely on active coping strategies that are linked to successful adaptation and “posttraumatic growth” (Florian et al., 1995; Schaefer and Moos, 1998).

Bereaved parents reported a more positive appraisal of the situation over time. It may be that much of the shock and confusion they experience in the immediate aftermath of their tragedy stems from threats to cherished assumptions of mastery, meaning, and self-worth (Tennen and Affleck, 1998). The age of the baby was also a predictor of mothers and fathers appraisal of the event. On first glance, these results seem to disprove studies reporting that reactions to loss are just as intense regardless of the age of the baby at the time of death (Smith and Borgers, 1989; Zeanah et al., 1995). Furthermore, they appear to support the notion that parents who experience an earlier loss report a more positive appraisal of the situation leading to less intense grief reactions than those who experience the loss of a stillbirth or neonatal death (Goldbac et al., 1991; Theut et al., 1989). However the reality appears to be more complex. Individually, age may be related to the perception of the event as it is to grief reactions. However with the exception of fathers at T2, age was not a predictor of health when all of the variables in the model were considered. This finding highlights the hazard of considering the baby’s age in isolation of the context of the parents’ perception of the event. Bereaved mothers and fathers’ perception of the event following a perinatal loss is an essential filter through which to view and care for these families. Indeed, the manner in which bereaved parents appraise their situation is more readily accessible to clinicians than hardiness or support. Soliciting couples’ perceptions surrounding the death of their baby is fundamental to an initial assessment carried out by nurses or other clinicians.

7.1.4. Health
Health was conceptualized and measured as an amalgam of individual grief reactions, marital satisfaction, and family functioning. Despite the robustness of the model across time, changes in some of the elements of the health index were revealed. Bereaved wives reported more intense grief reactions than their husbands over time lending support to previous research (Lang and Gottlieb, 1993; Lang et al., 1996). Mothers’ grief may be more intense due to the nature of their relationship developed with their infant. The role of
fathers has changed dramatically over the past decades, and they have become much more involved with their wife’s pregnancy and the care of their infant. However, it might be the quality of the experience that each parent has with their infant that results in the different intensities of grief reactions. Similarly, it is these same factors that may be at play when trying to understand why wives tend to have a more negative appraisal of the situation than their husband. These differences, in conjunction with the fact that in general mothers were more satisfied with their social support and less satisfied with their marital support than their husband, shed some light on the complexity of this experience.

Consistent with the literature, grief reactions significantly diminished over time in a linear fashion, for mothers and fathers (Dyregrov and Dyregrov, 1999; Lang et al., 1996; Schwab, 1996) while their appraisal of the situation became increasingly more positive. Moreover, those who lost a baby in the first trimester reported lower grief reactions than those whose baby was born alive. Although, these results seem to refute studies describing no differences in grief reactions regardless of the age of the baby at the time of death (Smith and Borgers, 1989; Zeanah et al., 1995) the complexity of the portrait cannot be over emphasized. When placed in the model of health along side other key variables such as resources and perception of the event, age of the baby is not a predictor of health.

Lack of main effect of time or differences between mothers and fathers on marital satisfaction lends support to the only other study located on bereaved husband and wife differences in ratings of marital intimacy and marital satisfaction following fetal/infant death (Lang and Gottlieb, 1991). Another study reported that subjects who perceived that they were well supported had a more positive relationship with their partners (Mekosh-Rosenbaum and Lasker, 1995). Lower social support from family and friends was associated with lower marital satisfaction. The relationships between marital and social supports alluded to in these studies lend support to this model where both marital and social supports were predictors of health.

Given that the group means for marital satisfaction (EMSS) were not any lower than the published means (Fowers and Olson, 1993) refutes the implication by some investigators that there is an increase in marital breakdown following this type of loss (Najman et al., 1993). Despite the lack of clarity on this issue, being part of a couple that had considered marital separation emerged as a predictor of health for parents, both as individuals and as a couple.

There were no main effects of time or gender for family functioning. It may be that the instrument was not sensitive enough to pick up on any existing differences. Alternatively, it may also be that the lack of differences between spouses’ rating is a reflection of how the death of a baby affects both partners in the marital dyad simultaneously. It exposes them to the same type of secondary losses in terms of disruption to existing family life as well as the loss of their hopes and dreams related to the baby and their own existence (Rando, 1991). Therefore, it is important to provide care not only to mothers, as is most often the case, or even to individual fathers, but rather to the couple or family as a unit, following the death of a fetus/infant.

7.2. Limitations

Although, the amplitude of the sample size and the longitudinal design render the results of this study compelling, the times between home visits would ideally have been longer. Another limitation pertains to the data being exclusively quantitative in a study with subject matter as sensitive and complex as bereavement or marital and family relationships. To optimize the robustness of the information garnered, a qualitative component of audio and/or video taped interviews would have complemented the data from the self-report questionnaires.

8. Conclusion

This study heightens understanding of the role that a personal resource such as hardiness, in relation to marital and social support as well as appraisal of the situation, can have on the health protection and promotion of bereaved parents. It provides empirical support for the explanatory model of health, over time for bereaved parents, both as individuals and as a couple following perinatal loss. Greater understanding of the complexity of the relationships between these variables is required in order to meet the long-term objective; for nurses and other clinicians to use this model, to guide the development of a comprehensive perinatal bereavement intervention aimed at helping vulnerable couples attain and maintain an optimal level of health as well as potentially a sense of personal growth following their loss.

Evidence of similitude in the model between spouses must be viewed in conjunction with the recognized differences of its individual elements such as grief reactions and perception of the event. These two phenomena are not incompatible. Rather, when using the model as a guide for intervention the differences need to be considered. Hardiness exhibited by mothers and fathers will reflect their sense of personal control over their life and events, their capacity for active orientation in seeking support, as well as their propensity to search for meaning following such a tragic event. Perception is key not only in couples’ appraisal of the event but also in the manner in which they view their life.
and relationships. These elements are fundamental to the care of bereaved parents.

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References


