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Development and psychometric properties of the Early Labour Experience Questionnaire (ELEQ)

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ABSTRACT

Objective: to describe the development and psychometric properties of the Early Labour Experiences Questionnaire (ELEQ).
Design: randomized controlled trial.
Setting: hospitals serving obstetric populations in metropolitan and suburban Vancouver, British Columbia, Canada.
Participants: 423 healthy nulliparous women in labour at term with uncomplicated pregnancies.
Intervention: women were randomized to telephone support ($n=241$) or home visit ($n=182$) study groups and completed the ELEQ during the postpartum phase of their hospital stay.
Measurement: the ELEQ contains 26 self-report items, rated on a 5-point scale, that measure women's affective experience of early labour (14 items), perceptions of nursing care (12 items), whether they would recommend this type of early labour care to a friend (1 item), and whether they believed they went to the hospital at the right time (1 item). An exploratory factor analysis was conducted to determine whether the items grouped together into subscales. The structural reliability of the extracted subscales and total scores were evaluated using a number of coefficients. To test criterion validity, we compared ELEQ item, subscale and total scores between the study groups.
Findings: item and total scores showed significant variability. Factor analysis yielded three subscales: Emotional Well-Being, Emotional Distress and Perceptions of Nursing Care. The subscale and total scores showed good internal consistency and item homogeneity, and were interrelated in the expected direction. Items evidenced strong associations with the subscale and total scores. Comparisons between study groups offered some support for criterion validity.
Key conclusions: pending further validation, the ELEQ can contribute to the assessment of women's experiences with different aspects of maternity care, evaluation of the quality of maternity care, and improvement of maternity services.

Introduction

The purpose of this study was to develop and test the psychometric properties of a questionnaire to measure women's experiences with their early labour care. The latent or early phase of labour is an understudied area in obstetrics and little is known regarding the best approach for managing labour during this period. Women are encouraged to stay away from hospital in early labour, and typically are cared for by their partners, family members, or in some cases, hired labour support persons (doulas) in their home. What research does exist suggests that provision of early labour care at home vs. in hospital has not been shown to change labour outcomes (Janssen et al., 2006a, 2006b; Cheyne et al., 2008; Hodnett et al., 2008; Spiby et al., 2008).

Home visits to women in early labour are within the scope of midwives in many jurisdictions, however the question of how best to support women in early labour remains unanswered. Studies from low resource settings have indicated that such support has the potential to prevent slow progress, fear, and the need for invasive pain management (Hodnett et al., 2007). Currently, no measure exists to assess women's experiences or satisfaction with early labour care, but findings from prior research support the need for such an instrument. For example, women who have been discharged from hospital to home after being told they are in early labour have expressed feelings of being unsupported, anxious, and their experience undervalued (Janssen et al., 2003; Barnett et al., 2008). Other studies have indicated that these concerns have led to women wanting to be in

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hospital during early labour (Cheyne and Hundley, 2009), a practice which has repeatedly been shown to be associated with increased rates of interventions and higher rates of caesarean delivery (Hemminki and Simukka, 1986; Bailit et al., 2005; Rahnama et al., 2006). We therefore undertook the task of designing a self-administered questionnaire to evaluate women's experiences with their early labour care.

Methods

The data for this study were drawn from the Early Labor Assessment and Support at Home (ELASH) trial, a multisite randomized controlled trial comparing telephone (the current standard of care) with home-based triage (Janssen et al., 2006a, 2006b). During the study, women seeking advice by telephone as to when to come to hospital or those who had presented at hospital for assessment and were being discharged because they were found to be in the latent phase of labour were informed about the study by hospital nurses. They were invited to speak to the study co-ordinator to find out more about the study. The co-ordinator assessed eligibility requirements and offered participation in the study to interested women. Verbal consent was obtained from women calling in by phone, followed by written consent when they arrived at the hospital. Among eligible women, the participation rate in the study was 93.8%.

A centralized randomization service accessed by a dedicated telephone line was used to assign participants to treatment arms. Randomization occurred at the point at which women had uncertainty as to whether or not to come to hospital. Women who had been consented in hospital, and were being discharged were therefore not randomized until they had gone home and once again arrived at a dilemma as to whether or not it was time to return.

Women in this trial were randomized to one of two management approaches. The treatment group received early labour assessment and support at home from a hospital-based maternity nurse. They were supported and encouraged to remain at home until labour entered the active phase (i.e., ≥ 4 cm of cervical dilatation) or until a change of condition (membranes rupturing, inability to deal with contractions) warranted admission to hospital. The control group received telephone support from the same group of hospital-based nurses whose time was dedicated to early labour care. Data from both groups were combined in the present study. The study was approved by the University of British Columbia Clinical Ethics Board as well as those of the participating hospitals.

Setting

The ELASH trial was conducted in seven hospitals with obstetric services in the City of Vancouver, British Columbia, and surrounding suburbs. Only one hospital, geographically isolated from the other centres, did not participate. Typically women in British Columbia give birth in hospital attended by obstetrical nurses and either family practice physicians or obstetricians. Physicians work in groups ranging from one to eight in size in which they rotate responsibility to attend births after regular office hours. Women are cared for by their chosen physician during pregnancy and, during the intrapartum period, by the physician on duty for the group. At the time of this study, midwifery was a new profession in British Columbia, and midwives attended less than 6% of hospital births. Approximately one-third of women attend prenatal education classes. Maternity care in British Columbia and throughout Canada is funded by provincial Ministries of Health.

Participants

Women were eligible to participate in the ELASH trial if they were registered to give birth at and lived within 30 mins of any one of seven hospitals providing maternity care to the City of Vancouver and suburbs. Additional eligibility criteria included: completion of 37–41 weeks of gestation; nulliparity, carrying a singleton fetus in the vertex presentation; ability to speak English, Cantonese, Mandarin, Punjabi, Korean or Farsi; access to a telephone; and age between 16 and 42 years. Women were excluded from participation if they had experienced antepartum bleeding, substance abuse, known abnormalities of the placenta, abnormal presentation of the fetus, multiple pregnancy, diabetes, heart disease, hypertension, fetal anomalies or abnormal amniotic fluid volumes; or any condition arising from or coexisting with pregnancy that their physician deemed to be a contraindication to remaining at home in early labour.

Table 1 reports descriptive statistics for participant characteristics. Women were on average 29.17 years of age (SD = 5.03), and almost all (97.6%) had a partner. Among participants, 37.4% had a university education while 21.5% had a high school education or less. Annual income was evenly divided among $20,000 increments with the exception of 39.5% reporting an annual income of $60,000 or more. At least 85% were employed or had a partner who was employed. Participants were multi-ethnic, but 76.6% spoke English as a primary language.

Measures and procedures

Instrument development

Items for the ELEQ were generated as part of a pilot study of early labour management among 237 women in Vancouver, BC (Janssen et al., 2003). The pilot survey consisted of 25 items with four possible responses; yes; no; not sure; and don't understand. These initial items were derived from a review of the literature. Population-based surveys attempting to delineate the important components of women's experience with maternity care have consistently identified quality of information received, quality of nursing care, and participation in the decision-making process as central themes (Séguin et al., 1989; Green et al., 1990; Brown and Lumley, 1994; Sadler et al., 2001). Further, receiving adequate information and a sense of control were important factors in achieving a sense of emotional well-being (Green et al., 1990). Hence our initial list of items, supported by qualitative analysis from our pilot study, included both items describing women's subjective experience and their evaluation of nursing care. These items were examined by an interdisciplinary team of five clinical experts for face and content validity. Revisions to item wordings were made where necessary and the refined items were tested as part of the pilot trial. We additionally included three open-ended questions inviting women to explain what made them decide to come to the hospital when they did, to clarify whether they felt that they went to the hospital too early or late, and if so, to explain why, and to provide any further comments they may have had regarding improvements that could be made with respect to early labour care.

One item that did not evoke variability in answers (*While you were in early labour at home did you feel content?*) was eliminated. Based on qualitative analysis of the responses to the open-ended questions, we added two items highlighting experiences of early labour which had not yet been identified; specifically, 'confused' and 'in control.' The response format for all items also was revised to a 5-point Likert scale as the *not sure* and *don't understand*

Table 1
Participants' socio-demographic characteristics.

	Final sample (n=423)		**Study group**			
			Home visit (n=241)		**Telephone support** (n=182)	
Age in years ($M \pm SD$)	29.17 ± 5.03		29.17 ± 4.93		29.17 ± 5.17	
	n	%	*n*	%	*n*	%
Marital status						
Partner	413	(97.6)	238	(98.8)	175	(96.2)
Lone parent	9	(2.1)	3	(1.2)	6	(3.3)
Missing	1	(0.2)	0	(0.0)	1	(0.5)
Education						
Some high school	27	(6.4)	14	(5.8)	13	(7.1)
High school diploma	64	(15.1)	40	(16.6)	24	(13.2)
Some post secondary	32	(7.6)	19	(7.9)	13	(7.1)
Trade school/college diploma	101	(23.9)	64	(26.6)	37	(20.3)
Some university education	39	(9.2)	16	(6.6)	23	(12.6)
University degree	158	(37.4)	87	(36.1)	71	(39.0)
Missing	2	(0.5)	1	(0.4)	1	(0.5)
Family income						
Less than $20,000	59	(13.9)	35	(14.5)	24	(13.2)
$21,000–$39,000	91	(21.5)	49	(20.3)	42	(23.1)
$40,000–$59,000	79	(18.7)	50	(20.7)	29	(15.9)
$60,000 or more	167	(39.5)	94	(39.0)	73	(40.1)
Missing	27	(6.4)	13	(5.4)	14	(7.7)
Employment						
Full time	270	(63.8)	150	(62.2)	120	(65.9)
Part time	41	(9.7)	22	(9.1)	19	(10.4)
Unemployed	109	(25.8)	68	(28.2)	41	(22.5)
Missing	3	(0.7)	1	(0.4)	2	(1.1)
Partner employment						
Full time	358	(84.6)	9	(3.7)	152	(83.5)
Part time	14	(3.3)	206	(85.5)	5	(2.7)
Unemployed	37	(8.7)	21	(8.7)	16	(8.8)
Not applicable	9	(2.1)	3	(1.2)	6	(3.3)
Missing	5	(1.2)	2	(0.8)	3	(1.6)
Ethnicity						
White	193	(45.6)	112	(46.5)(23.2)	81	(44.5)
East Asian	104	(24.6)	60	(24.9)	44	(24.2)
South Asian	98	(23.2)	56	(23.2)	42	(23.1)
First Nation	6	(1.4)	5	(2.1)	1	(0.5)
Black	6	(1.4)	1	(0.4)	5	(2.7)
Other	16	(3.8)	7	(2.9)	9	(4.9)
Missing	0	(0.0)	0	(0.0)	0	(0.0)
Primary language						
English	324	(76.6)	182	(75.5)	142	(78.0)
Other	98	(23.2)	59	(24.5)	39	(21.5)
Missing	1	(0.2)	0	(0.0)	1	(0.5)

responses were infrequently endorsed and we wanted to capture the range and diversity of experience.

The revised questionnaire was again reviewed by a multidisciplinary team of 5 clinical experts and pilot tested among 12 women who had given birth within the preceding 48 hrs. These women indicated that the items were easy to understand and that they were able to complete the form in less than 10 mins. No further changes were made.

Data collection and coding

Participants completed the ELEQ during the postpartum phase of their hospital stay. The self-administered survey was distributed and collected on the same day by the research coordinator in sealed envelopes identified by study number only. Approximately two-thirds of women participating in the ELASH trial received a study questionnaire (75.0% on the home visit group and 52.7% in the telephone support group), due to our inability to provide staffing of research nurses around the clock to all hospitals. Generally, we provided staffing 5–6 days per week (18 hrs/day). No women refused to complete the study questionnaires.

Surveys with 10% or more of the items unanswered were removed from analyses (4.5%, $n=20$), for a final sample of 423 surveys (241 completed by women in the home visit group and 182 completed women in the telephone support group). All items were recoded such that a higher value represented a more positive rating.

Statistical analyses for psychometric testing

All analyses were conducted using IBM SPSS Statistics 19 for Windows. We report descriptive statistics for the Early Labour Experience Questionnaire (ELEQ) item and total scores. For subsequent analyses, missing items were imputed by taking the mean of all responses to that item.

An exploratory factor analysis using principal axis factoring with an oblique rotation was conducted to determine whether the items grouped together into a smaller number of conceptually

coherent and empirically supported subscales. Specifically, we examined whether items 1–14 (Table 2) formed a subscale measuring women's affective experience of early labour and whether items 15–24 formed a subscale measuring women's perceptions of the nursing care they received during early labour. Items 25 and 26 were not included in the factor analysis because we felt they differed meaningfully from the proposed subscales and represented distinct constructs related to experience with early labour care. Multiple criteria were used to determine the number of subscales. Specifically, we retained factors that had eigenvalues greater than 1.00 (Costello and Osborne, 2005; Kahn, 2006), and three or more items loading at 0.32 or greater (Comrey and Lee, 1992; Costello and Osborne, 2005).

Total scores and the subscales extracted from the factor analysis were evaluated in terms of structural reliability using a number of coefficients. Internal consistency of the subscales was examined using Cronbach's α coefficient. Values >0.80 indicate good internal consistency (Nunnally and Bernstein, 1994). We additionally examined whether there were any items for which deletion resulted in an increase of 0.10 or more in the α coefficient (Ferketich, 1991; Nunnally and Bernstein, 1994). Mean inter-item correlations (MICs) were computed to examine item homogeneity. Values between 0.20 and 0.50 are considered acceptable (Nunnally and Bernstein, 1994). We calculated mean corrected item-total correlations (MCITCs) to examine the strength of association between items, subscale and total scores. Values >0.30 are considered acceptable (Nunnally and Bernstein, 1994). We additionally calculated Pearson r correlations between the subscale and total scores. Coefficients <0.10 reflect a small association, 0.30 moderate, and 0.50 large (Swets, 1988).

To test criterion validity, we compared the ELEQ scores between the study groups using independent t-tests and Cohen's d (Cohen, 1988). Values of 0.20 indicate small, 0.50 indicate medium, and 0.80 indicate large differences, respectively (Cohen, 1988). We hypothesized that women who received home visits would have had a more positive early labour experience and thus, have higher ELEQ scores than women who received telephone support.

Results

Item ratings

Table 2 presents descriptive statistics for item ratings. Overall, participants made use of the full range of scores (from 1 to 5) for all items, except for item 19, suggesting good variability and distribution at the item level. With a few exceptions (items 6, 7, and 9), mean item ratings were on the positive end of the scale. Total scores ranged from 56 to 130 (possible range=26–130), with a mean of 103.14 ± 12.45. Data were imputed for 2% of respondents and rates of missing values differed by 1% between trial arms.

Factor analysis

The ELEQ demonstrated good sample adequacy for factor analysis (Kaiser–Meyer–Olkin index=0.86) and Bartlett's sphericity test supported the appropriateness of the data set for factor analysis, ($\chi^2=3{,}656.60$, $p<0.001$). Very low communalities were observed for items 22 (*Did the nurse and doctor work as a team in providing care?*) and 24 (*Do you feel the nurse treated you in a rude way?*), suggesting that they were unrelated to other items in the set. Thus, we reran the factor analysis excluding these two items. Again, the Kaiser–Meyer–Olkin index (0.87) and Bartlett's sphericity test ($\chi^2=3{,}520.67$, $p<0.001$) supported the analysis. Constraining the number of factors to two (i.e., affective experience

Table 2
Early labour satisfaction questionnaire item characteristics.

	Final sample	
	$M \pm$ SD	Range
Item scores		
1. While you were in labour at home did you feel safe?	4.03 ± 1.13	1–5
2. While you were in labour at home did you feel confident?	3.61 ± 1.14	1–5
3. While you were in labour at home did you feel scared?	2.54 ± 1.30	1–5
4. While you were in labour at home did you feel happy?	3.64 ± 1.24	1–5
5. While you were in labour at home did you feel excited?	4.04 ± 1.08	1–5
6. While you were in labour at home did you feel anxious?	1.90 ± 1.11	1–5
7. While you were in labour at home did you feel relaxed?	2.98 ± 1.27	1–5
8. While you were in labour at home did you feel comfortable?	3.44 ± 1.31	1–5
9. While you were in labour at home did you feel tense?	2.37 ± 1.17	1–5
10. While you were in labour at home did you feel supported?	4.52 ± 0.84	1–5
11. While you were in labour at home did you feel distressed?	3.05 ± 1.30	1–5
12. While you were in labour at home did you feel insecure?	3.32 ± 1.33	1–5
13. While you were in labour at home did you feel in control?	3.44 ± 1.17	1–5
14. While you were in labour at home did you feel confused?	3.10 ± 1.36	1–5
15. When you were in early labour at home, did the nurse give you the information you wanted?*	4.67 ± 0.70	1–5
16. When you were in early labour at home, did the nurse reassure you when you needed it?*	4.62 ± 0.73	1–5
17. When you were in early labour at home, did the nurse spend enough time with you?*	4.54 ± 0.91	1–5
18. When you were in early labour at home, did the nurse listen carefully to what you had to say?*	4.83 ± 0.54	1–5
19. When you were in early labour at home, did the nurse treat your family and/or friends with respect?*	4.90 ± 0.38	2–5
20. When you were in early labour at home, did the nurse respect your wishes about going to the hospital?*	4.73 ± 0.68	1–5
21. When you were in early labour at home did you feel that you have confidence in the nurse?*	4.74 ± 0.61	1–5
22. When you were in early labour at home did the nurse and doctor work as a team in providing your care?	4.40 ± 0.98	1–5
23. When you were in early labour at home did you feel the nurses alway was at ease and calm with you?	4.83 ± 0.52	1–5
24. When you were in early labour at home do you feel the nurse treated you in a rude way?*	4.91 ± 0.42	1–5
25. Would you recommend this type of early labour to a friend?*	4.63 ± 0.79	1–5
26. Did you feel you went to the hospital at the right time?*	4.44 ± 0.98	1–5
Total score*	101.64 ± 12.84	56–130

Note: All items were recoded such that a higher value represented a more positive rating.

[a] Comparisons revealed significant differences between study groups.

and perceptions of nursing care) accounted for 42.8% of the variance (27.6% and 15.1%, respectively). However, visual examination of the scree plot suggested the presence of one or two additional factors (see Fig. 1). Review of the factor loadings also revealed that item 5 (*While you were in labour did you feel excited?*) did not load on either factor and that item 10 (*While you were in labour did you feel supported?*) crossloaded on factors 1 (0.34) and 2 (0.36), suggesting that a 2-factor model may not represent the optimal structure for ELEQ scores.

Allowing the number of factors to remain unconstrained, four factors were extracted that had eigenvalues greater than 1.00. The first factor (eigenvalue = 6.08) accounted for 27.6% of the variance, the second factor (eigenvalue = 3.33) accounted for 15.1% of the variance, the third factor (eigenvalue = 1.72) accounted for 7.8% of the variance, and the fourth factor (eigenvalue = 1.12) accounted for 5.1% of the variance. A closer examination of the 4-factor solution revealed that the fourth factor comprised only two items. In addition, the convergence of item loadings was difficult to interpret. In light of these findings, the analysis was rerun constraining the number of components extracted to three. Results from this analysis produced three interpretable factors that accounted for 50.6% of the variance and had approximately equal numbers of items loading on each factor: Factor 1—Emotional Well-Being (8 items), Factor 2—Perceptions of Nursing Care (8 items), and Factor 3—Emotional Distress (6 items). Item factor loadings are provided in Table 3. All factor loadings were ≥ 0.40 and there were no crossloading items.

Total and subscale analysis

Table 4 presents the psychometric characteristics of the subscale and total scores. Internal consistency of the subscale and total scores was good, as indicated by Cronbach's α coefficients ranging from 0.80 (Emotional Distress) to 0.87 (Total Score). There were no items for which deletion resulted in an increase of 0.10 or more in α. Examination of the MICs reveals good item homogeneity for the subscales, with all values falling within the acceptable range 0.20–0.50. MCITCs indicate good associations between items and scale scores, with all values exceeding 0.30.

Table 5 presents the associations between the subscale and total scores. Review of the Pearson r correlation coefficients indicates that the strength of associations between the subscales

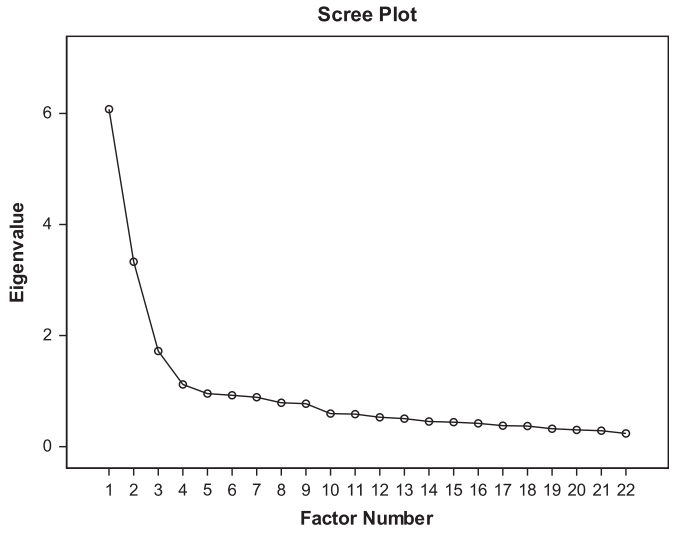

Fig. 1

Table 3
Factor loadings for 3-factor solution.

Items	Factor loadings
Factor 1: Emotional well-being	
4. While you were in labour at home did you feel happy?	0.74
2. While you were in labour at home did you feel confident?	0.63
5. While you were in labour at home did you feel excited?	0.61
1. While you were in labour at home did you feel safe?	0.57
7. While you were in labour at home did you feel relaxed?	0.55
13. While you were in labour at home did you feel in control?	0.51
8. While you were in labour at home did you feel comfortable?	0.43
10. While you were in labour at home did you feel supported?	0.40
Factor 2: Perceptions of nursing care	
16. When you were in early labour at home, did the nurse reassure you when you needed it?	0.78
18. When you were in early labour at home, did the nurse listen carefully to what you had to say?	0.78
15. When you were in early labour at home, did the nurse give you the information you wanted?	0.73
17. When you were in early labour at home, did the nurse spend enough time with you?	0.72
21. When you were in early labour at home did you feel that you have confidence in the nurse?	0.66
20. When you were in early labour at home, did the nurse respect your wishes about going to the hospital?	0.55
19. When you were in early labour at home, did the nurse treat your family and/or friends with respect?	0.50
23. When you were in early labour at home did you feel the nurse always was at ease and calm with you?	0.43
Factor 3: Emotional distress	
3. While you were in labour at home did you feel scared?	0.82
9. While you were in labour at home did you feel tense?	0.64
6. While you were in labour at home did you feel anxious?	0.55
11. While you were in labour at home did you feel distressed?	0.54
12. While you were in labour at home did you feel insecure?	0.51
14. While you were in labour at home did you feel confused?	0.47

Table 4
Psychometric characteristics of subscale and total score.

	$M \pm$ SD	α	MIC	MCITC
Subscale scores				
Emotional well-being	29.70 ± 6.30	0.84	0.39	0.57
Perceptions of nursing care	37.86 ± 3.57	0.84	0.41	0.58
Emotional distress	16.29 ± 5.38	0.80	0.40	0.56
Total scores	102.24 ± 12.71	0.87	0.22	0.43

Notes: For these analyses, missing items were imputed by taking the mean of all responses to that item.

Table 5
Associations between subscale and total scores.

	Subscale scores			Total scores
	Emotional well-being	Perceptions of nursing care	Emotional distress	
Subscale scores				
Emotional well-being	–	–	–	–
Perceptions of nursing care	0.30***	–	–	–
Emotional distress	0.53***	0.17***	–	–
Total scores	0.85***	0.60***	0.76***	–

Note. Values are Pearson r correlations. For these analyses, missing items were imputed by taking the mean of all responses to that item.

*** $p < 0.001$. For these analyses, missing items were imputed by taking the mean of all responses to that item.

ranged from small (0.17 between Perceptions of Nursing Care and Emotional Distress) to large (0.53 between Emotional Well-Being and Emotional Distress). All strengths of association between the subscales and total scores were large (≥ 0.60).

Criterion validity

Total scores were significantly higher for women who received home visits compared to women who received telephone support ($t[421]=2.77$, $p<0.01$, $d=0.27$). Mean scores on the Perceptions of Nursing Care subscale differed significantly in the expected direction (38.64 ± 2.90 vs. 36.82 ± 4.09, $t[421]=5.34$, $p<0.001$, $d=0.51$); however, scores on the Emotional Well-Being (29.61 ± 6.45 vs. 29.82 ± 6.11) and Emotional Distress (16.64 ± 5.53 vs. 15.83 ± 5.16) subscales did not differ significantly (all $p>0.05$). The questionnaire is provided in Table 6.

Discussion

The purpose of this study was to develop and test the psychometric properties of a scale designed to measure women's experience with their early labour care. Results provide preliminary support for the reliability and validity of ELEQ total and subscale scores. Many different factors may affect women's perception of their birth experiences (Van Teijlingen et al., 2003; Goodman et al., 2004; Waldenstrom et al., 2006) and measurement of women's experience with different aspects of care may inform research and clinical efforts (Smith, 2001; Van Teijlingen et al., 2003; Janssen et al., 2006a, 2006b; Rudman et al., 2007; Gungor and Beji, 2011). To our knowledge, this is the only instrument available designed to measure women's experience with their early labour care.

The overall mean score for the ELEQ was high, 101.64 out of a possible 130. This finding is consistent with prior research

Table 6
Early Labour Experience Questionnaire.

Instructions: Please answer these questions in relation to the time you spent in early labour before you came into hospital. Please circle the answer most appropriate for you.

While you were in labour at home did you feel:

1. Safe?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
2. Confident?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
3. Scared?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
4. Happy?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
5. Excited?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
6. Anxious?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
7. Relaxed?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
8. Comfortable?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
9. Tense?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
10. Supported?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
11. Distressed?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
12. Insecure?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
13. In control?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
14. Confused?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all

Table 6 (*continued*)

When you were on early labour at home, did the nurse:

15. Give you the information you wanted?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
16. Reassure you when you needed it?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
17. Spend enough time with you?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
18. Listen carefully to what you had to say?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
19. Treat your family and/or friends with respect?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
20. Respect your wishes about going to hospital?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
21. Did you feel that you had confidence in the nurse?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
22. Did the nurse and the doctor work as a team in providing your care?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
23. Did you feel the nurse always was at ease and calm with you?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
24. Do you feel the nurse treated you in a rude way?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
25. Would you recommend this type of early labour care to a friend?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all
26. Did you feel you went to the hospital at the right time?				
1	2	3	4	5
Yes, definitely	Yes, somewhat	Not sure	Not very much	Not at all

Thank you for helping us to learn more about caring for women in early labour!.

demonstrating that women's experience with childbirth care tends to be positive (Janssen et al., 2006a, 2006b). However, we did see considerable variation in total scores, with a low of 56 and high of 130. We also observed considerable variability and distribution at the item level, with ratings representing the full range of scores from 1 to 5, except for item 19 (*When you were in early labour at home, did the nurse treat your family and/or friends with respect?*). Taken together, the significance of these findings is twofold. First, women are generally satisfied with their early labour care experiences. Second, ELEQ item and total scores are able to discriminate among women in terms of their experience with their early labour care, even among this fairly homogenous sample.

The factor analysis supported the concept of women's experience with their early labour care as a multidimensional construct. We had originally anticipated identifying two factors underlying assessments of women's experience with their early labour care; namely, women's affective experience of early labour and their perceptions of nursing care. However, our analyses suggested a 3-factor model, with women's affective experience of early labour subdivided into two distinct subscales measuring their sense of emotional well-being and feelings of emotional distress.

The first subscale, Emotional Well-Being, was comprised of eight items and explained more than a quarter of the variance in ELEQ scores. Women's description of their care as satisfactory is often described within the context of subjective well-being and vice versa (Diener et al., 1999). The second subscale, Perceptions of Nursing Care, accounted for considerably less variance (15.1%), suggesting that the quality of nursing care (assuming some minimal acceptable and adequate level of care) is less important to women's early labour care experiences, than are their moods or emotions. Again, this is consistent with the literature in other domains which describes moods and emotions – together referred to as 'affect' – as representing people's evaluations of the events that occur in their lives (cf. Diener et al., 1999). Finally, the third subscale, Emotional Distress, accounted for less than 10% of the variance, but nonetheless emerged as an important and distinct component of women's experience with their early labour care. The cleaving of the items measuring women's affective experiences into two distinct factors, one reflecting positive emotions and the other reflecting negative emotions, is also consistent with the extant literature. It has long been posited (Bradburn and Caplovitz, 1965) that pleasant and unpleasant affect represent two dimensions that should be measured separately. Indeed, prior research indicates that these two constructs are distinct, though inversely correlated (e.g., Diener and Emmons, 1984; Diener et al., 1995), as was found in the present study.

Findings of the present study also offered strong support for the reliability of ELEQ subscale and total scores. Specifically, internal consistency was good, as indicated by Cronbach α

coefficients greater than 0.80 for the subscale as well as total scores. Additional analyses revealed good item homogeneity with subscales and overall, indicated by MICs between 0.20 and 0.50, and strong associations between items and scale scores, with MCITCs exceeding 0.30. Also, there were no items for which deletion resulted in an increase of 0.10 or more in α for either the subscale or total scores, indicating their association with maternal experience. Moreover, the subscale and total scores were interrelated and in the expected directions (taking into account that all items had been recoded such that higher scores indicated more positive ratings). All told, these findings suggest that the ELEQ items may be summed overall or within the subscales to create reliable scores.

Results also provided some support for criterion validity. The overall scores for the home visit group were significantly higher than those of the telephone support group. In light of these generally positive psychometric results, the use of the ELEQ may be relevant to several aspects of practice. Firstly, when and how often women present at hospital in latent phase labour may be related to their experience with early labour care. Presentation in early labour is associated with concomitant use of interventions which may ultimately impact labour outcomes, including use of caesarean section (Hemminki and Simukka, 1986; Bailit et al., 2005; Rahnama et al., 2006). Multiple admissions have implications for use of hospital resources. Evaluation of ELEQ findings may prompt changes in early labour care aimed at promoting women's confidence and ability to remain at home until the transition from latent to active phase labour.

Interpretation of our findings is restricted by several limitations of the study design. Specifically, we sampled nulliparous women. ELEQ scores will need to be examined among multiparous women. Additionally, the vast majority of women were English-speaking and almost half were White. The generalizability of our findings to demographically and culturally diverse samples will need to be tested. Moreover, our analyses of validity focused on whether ELEQ scores could differentiate between known groups of women who were hypothesized to differ in terms of experience with their early labour care (i.e., criterion validity); however, it will be important to examine other forms of validity, such as convergent and divergent validity. We conducted exploratory, but not confirmatory, factor analyses to identify the ELEQ subscales. The 3-factor structure described herein will need to be confirmed in future research. Our analysis of reliability did not include evaluation of test–retest reliability, which should be examined in future studies. Finally, our study groups were unequal in size. We are confident that there was no bias in the distribution of study questionnaires to women in either trial arm, as the same nurses distributed questionnaires to women in each group. Women in the telephone triage group may have been less likely to complete questionnaires, although all agreed initially to do so. This would be consistent with our finding that women in the telephone triage group scored their nursing care less positively. If women in this group who were the least satisfied with their nursing care were less likely to return questionnaires, then our bias is conservative as we may have underestimated the differences between groups.

In spite of these limitations, the present study offers preliminary support for the reliability and validity of ELEQ scores for measuring women's experience with their early labour care. The changing nature of maternity care demands consistent and ongoing evaluation of various factors that affect women's satisfaction with their birth experiences. The ELEQ may be scored by summing responses to all items or by subscale, depending on the purpose of the assessment. It is also easy to administer and relatively short. For these reasons, and pending further validation, the ELEQ has the potential to contribute to the assessment of women's experience with different aspects of early labour care, and ultimately improvement in management of early labour among healthy women.

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