DEVELOPMENT OF A LABOUR PAIN ASSESSMENT INSTRUMENT

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ABSTRACT

Labour may impose severe pain, yet women experience the intensity of pain differently. The severity of labour pain is frequently underestimated by women, midwives and clinicians. Pain assessment is considered the key to labour pain measurement and a standardised instrument can assist with adequate management of labour pain. Although a variety of pain assessment/measurement tools were found by a search conducted between 2000 and 2010, the tool charts are detailed and require time to complete, they do not cover all aspects of labour, and they avoid quantifying and documentation of labour pain. Developing a new multidimensional labour pain assessment instrument could assist midwives and clinicians with labour pain control. Ethical permission was obtained from the university Faculty Academic Ethics Committee to develop a new labour pain assessment instrument. Six steps of Blackburn and Waite (2006:134) guided development of the instrument that measures pain during the first stage of labour. This exploratory sequential mixed method study, using a qualitative and quantitative research design, described the development process of the new instrument. Four focus groups with four to six members comprising midwifery lecturers, midwives working in the private and public hospitals, midwives in private practice and obstetricians were conducted to develop the instrument. The instrument was thereafter given in two Delphi technique rounds to the most senior persons teaching Midwifery at all South African

universities to verify the content and structure of the instrument. Data analysis of the focus groups followed the steps of data reduction, data display and verification as proposed by Miles and Huberman (1994:428–444) and the mean ratings of the Likert scale as determined by the university was presented in tables. The trustworthiness and validity and reliability (truth value) of the instrument were supported by using multiple types of data to develop the instrument. The focus group members and Delphi experts expressed their enthusiasm and appraisement for a new labour pain assessment instrument. A sense of closure (saturation) was attained and the experts concluded that the instrument was ready to be tested.

Keywords: labour pain, labour pain assessment, labour pain measurement

INTRODUCTION

Pain during labour is regarded as of the most intense type of pain a woman may endure in her lifetime (Camann, 2005:718). Labour pain changes during the course of labour, becomes more intense and the experience is always unique given the various contributing physiological, emotional, social, and cultural components (Roberts, Gulliver, Fisher & Cloyes, 2010:107). Abushaikha and Oweis (2005:33–34) classify labour pain as an intricate part of the childbirth experience; a culmination of both physiological and psychological factors. Physiological factors that contribute to labour pain are uterine contractions, dilatation and effacement of the cervix. Psychological factors contributing to a sensory overload in the women and her fatigue threshold are the increasing uterine contractions, nausea and vomiting, routine care such as vaginal examinations and personnel changes, fear of an unfamiliar environment and a sense of loss of control and abandonment. Some women may experience a high degree of physical pain without suffering, while others suffer greatly from pain that midwives and clinicians think is modest (Rooks, 2012:318).

Exploring women's satisfaction with hospital-based intrapartum care, Mohammad, Shaban, Homer and Creedy (2014:34) found that 43.3% of Jordanian women indicated that their labour was more painful than expected and 63.8% were unhappy with the method of pain relief used. A study conducted in Indonesia on the management of labour pain revealed that women reflected limited pain management with no assessment (Rachmawati, 2012:269). Midwives and clinicians were more interested in the progress of labour and prevention of complications than alleviating labour pain.

Relieving pain during labour is a major part of modern obstetric care. As labour is both a sensory and affective phenomenon, nurses caring for women in labour should learn to understand, assess, and intervene in the pain and discomfort of labour according to the individual woman's needs and desires (Chang, Chen & Huan, 2006:190). Pain assessment is seen as the first step towards understanding pain as patients experience it and, in conjunction with a nursing diagnosis, provides the basis for planning pain

relief (McLafferty & Farley, 2008:42). Bird (2003:33) claims that pain measurement is a prerequisite to effective treatment and management of pain.

The growing number of mandates for documentation and reporting of labour pain poses significant challenges to pain assessment and management. A systematic literature review was conducted to identify pain assessment instruments that could be used to assess and measure pain during the first stage of labour. It was apparent that accurate and objective measures of labour pain were scarce. Of the variety of pain assessment and measurement tools available to practitioners, only some pain intensity scales and rating instruments have been tested for their applicability during labour. The following seven pain scales, rating instruments and an algorithm found in the literature were utilised to assess labour pain (see the detailed discussion of the limitations of each instrument in Table 1):

Table 1:   Pain intensity scales and rating instruments

Name of the instrument	Instrument description	Clinical utility	Limitations during labour
Unidimensional pain scales			
Verbal Rating Scales (VRS) (Ohel et al., 2007)	List of adjectives describing levels of pain intensity from least to most intense: 'No pain, moderate pain, severe pain'	Quick and easy to use to measure pain intensity from least to most acute pain conditions Patient chooses word that best describes the intensity of pain	Dependent on interpretation and the understanding of the patient Measures only pain intensity
Numerical Rating Scales (NRS) (Gulliver et al., 2008)	Pain intensity continuum with 0 representing 'no pain' and 10 the other extreme, 'unbearable pain'	Easy and simple to understand Patient rates pain from 0 to 10 Delivered graphically or verbally	Confuses patients Measures only pain intensity Lacks statistical richness of a full-length scale Labour staff reports dissatisfaction with the effectiveness
Visual Analogue Scales (VAS) (Nikkola et al., 2006)	Graphic-rating scale consisting of a 100mm unmarked line labelled with 'no pain' and 'worst imaginable pain'	Quick and easy to use; avoids imprecise terminology Cannot adequately discriminate between a patient who desires analgesia or no pain relief	Reliable to estimate pain intensity Patients have to be taught in advance

Picture scales Faces Pain Rating Scale (Jastrzab et al., 2009)	Six faces are depicted ranging from a happy, smiling face each becoming progressively sadder – evenly numbered 0 to 10 The happy face indicating 'no hurt' is positioned at 0 and the saddest face under 10 indicates 'hurt worst'	The patient chooses the face that depicts her pain best Pictorial – translation not needed	A single scale is not appropriate for all pain Measures only pain intensity Not used as a self-report by midwives
Behavioural Scale Five point behavioural scale (Da Silva et al., 2009)	Intensity 0 to 4 with 0 representing 'no or little pain' and 4 'severe pain'	The midwife records pain score according to the observed behaviour	Pain behaviour varies within cultures. Cultures has unique distress languages
Multidimensional pain tools			
McGill Pain Questionnaire (MPQ) (McLafferty & Farley 2008; Flink et al., 2009; Capogna et al., 2010)	Recognises the multidimensional nature of the pain experience Determines intensity, quality and duration of the pain, enhances diagnoses techniques, assists with therapeutic decisions and evaluates effectiveness of interventions Self-report inventory of 78 pain descriptors measuring: Sensory qualities – 10 sets Affective qualities – 5 sets Evaluative – 16 sets Miscellaneous words – 4 sets	The patient selects the sets that are relevant to her pain and circles the words that best describe it	MPQ takes 10 minutes to complete Short-Form McGill Pain Questionnaire (SF-MPQ) takes 2 to 5 minutes to complete (during intense labour the contractions are long and strong)

Coping With Labor Algorithm© (Roberts et al., 2010)	Labour pain algorithm with two pathways with cues: Coping path rhythmic activity breathing inward focus relaxing between contractions verbalising of coping Not coping path (3 colour-coded branches with green representing 'coping' and red 'not coping') Orange represents the 'physiological process of labour' (demands attention) Yellow represents the 'physical environment' Blue represents the 'emotional and psychosocial aim'	Passes the Joint Commission inspection at one institution Specifically designed for women to cope in labour Enables a woman to avoid quantifying labour pain Serves as a staff education tool to orientate new care providers	Does not cover all aspects of labour pain Pain recordation not indicated on algorithm Lengthy to incorporate in labour documents

STATEMENT OF THE PROBLEM

The management of pain during the first stage of labour remains a debated topic as more women become aware of their rights to better quality of care in labour and seek to fulfil their need for pain relief during labour (Ogboli-Nwasor & Adaji, 2014:20). Estimation of labour pain is not straightforward (Williams, Morris, Stevens, Gessler, Cella & Baxter, 2013:68). Labour pain may intensify quickly during the active phase of labour. Pain associated with uterine contractions affects the physiological mechanisms of a number of body systems that may invariably lead to generalised and widespread physiological stress responses. Maternal pain increases secretion of catecholamines (epinephrine and norepinephrine) from the adrenal gland. High levels of catecholamines inhibit oxytocin production and have been associated with longer labour, adverse foetal heart rate patterns and progressive foetal metabolic acidosis (Alehagen, Wijma, Lundberg & Wijma, 2005:153).

Nurses are responsible to assess and diagnose pain, treat the pain, and then reassess the patient to evaluate the effectiveness of these interventions and the need for further treatment such as an epidural (Manworren, 2007:196). By using a pain rating instrument the midwife can assess labour pain individually, enter a pain score, provide pain relief for the patient with an elevated score, and document the post-administration score. Assessment of labour pain remains a challenging issue for midwives designing interventional protocols (Chang, Chen & Huan, 2006:190). Numerous pain instruments measuring chronic and acute pain are currently in use to measure cancer, chronic and acute pain. Recent measures include verbal descriptors such as the McGill Pain Questionnaire (MPQ) (Chang, Cheng & Huan, 2006:191–195; McLafferty & Farley, 2008:43–44), the Numerical Rating Scale (NRS) or Verbal Rating Scale (VRS) (Ohel, Walfisch, Shitenberg, Sheiner & Hallak, 2007:104–108), the Visual Analogue Scale (VAS) (Winkelman, Norman, Maloni & Kless, 2008:104–109), caregiver ratings of pain and pain relief such as the Wong-Baker FACES Pain Rating Scale (McLafferty & Farley, 2008:45) and the Coping With Labor Algorithm© (Roberts, Gulliver, Fisher & Cloyes, 2010:107–116).

Many problems were encountered applying these methods to women in labour. The charts are detailed and require time to complete. The many pain descriptors of multidimensional methods take long to complete when contractions are long and intense. Much of the research is also performed retrospectively. Memory and time alter true pain recall. The aforementioned studies did not take into account the impact of variables such as self-efficacy, anxiety, analgesics, childbirth education preparation, length of labour, and differences in midwives' approaches to pain relief. Bird (2003:33) and Yerby and Page (2000:38) state the reliability and validity of pain measurement tools cannot be presumed because none holds psychometric stability in every environment. In addition, the existing methods do not indicate the very specific times pain should be assessed during labour. Bryant (2007:8) advises that, when no single pain assessment tool is appropriate, an adopted tool, or a combination of tools, can provide comprehensive

assessment if used in a way that is sensitive to patient needs. The purpose of this study was therefore to develop a new labour pain assessment instrument to allow midwives and clinicians to recognise when women need pain relief and assist women to experience pain during labour without severe suffering.

PURPOSE OF THE STUDY

The purpose of the study was to describe development of a new labour pain assessment.

DEFINITION OF CONCEPTS

Labour pain ensues from interaction between physiological and psychological factors that include uterine contractions and dilatation of the cervix (Abushaikha & Oweis, 2005:33). During the late first stage of labour, pain is caused by stretching of the vagina and pelvic floor to accommodate the presenting part.

Labour pain assessment is the first step towards understanding pain as the patient experiences it and provides the basis for planning pain relief. Pain assessment should be ongoing and continuous and the patient's reported pain experience should be accurately documented (McLafferty & Farley, 2008:46).

Labour pain measurement is an estimation or appraisal of labour pain using standardised measurement tools (Bryant, 2007:7).

ETHICAL CONSIDERATIONS

The research proposal was approved by the University of Johannesburg Faculty Academics Ethics Committee (AEC71/2009). The nursing directors of the provincial and private hospitals granted written permission to use the facilities to conduct the interviews. The aim of the study, procedure and ethical principles were explained to the focus group members, and Delphi technique experts and confidentiality were maintained. Participation was voluntarily and permission to audio-recording of the interviews was obtained.

RESEARCH METHODOLOGY

Design

An exploratory sequential mixed method study was followed to describe the development process of the labour pain assessment instrument. The use of different research methods addresses different aspects of the overall research question and is an expansive and

creative form of research seen as necessary due to the complexity of instrument development (Polit & Beck, 2012:608). After a draft instrument was developed from the literature, qualitative focus group interviews were used during the first stage of the study to identify areas in the instrument for improvement. A quantitative Delphi technique was used in the second stage of the study to further explore and support the data from the focus group interviews.

Development of the draft Labour Pain Assessment Instrument

Based on the need for better labour pain assessment, a new instrument was developed. The first six steps of Blackburn and Waite (2006:133–134) were used to develop and refine the instrument. These steps included item generation, item selection, item description, pilot testing, analysis for reliability and validity, and refinement of the instrument. Comprehensive pain assessment necessarily includes location and quality of pain in the body, duration of the pain since the onset and response to treatment such as medication (Foster, 2007:137; Ong & Seymour, 2004:16).

Baseline data such as hospital, ethnicity, social background, cervical dilatation, method of pain relief and length of labour were included to document during admission or at the time of pain assessment. Suggested times of assessment can serve as a guide of when to assess/reassess labour pain. During the steps of item generation and selection, accepted pain models and well-known multidimensional pain assessment instruments such as the McGill Pain Questionnaire guided the inclusion of the dimensions (items) in the draft instrument. Five pain assessment items were included in the instrument, namely, intensity, quality, behavioural and physiological parameters, fatigue threshold and psychosocial and emotional status. Scores were added below the items for the women and midwife to rate the pain. The descriptors of each pain measure can also serve as non-verbal pain indicators when the pain is too severe for the patient to comprehend or she is unable to communicate. Da Silva, De Oliveira and Nobre (2009:293) claim that pain intensity can be evaluated using subjective reports of pain experiences, or by observing. Quality is a pain characteristic that comprises the pain sensory aspects of the sensory-discriminative dimension. The quality of the birth experience is reduced by pain (Christiaens & Bracke, 2007:2). At the behaviour/physiological parameters, Bell (2006:40) includes body language such as restlessness, fidgeting, changing position and vocalisation. According to Tzeng, Chao, Kuo and Teng (2008:241), fatigue is part of combined disorders of the active phase of labour. Prolonged labour leads to resignation, fatigue and exhaustion (Nystedt, Högberg & Lundman, 2006:61). Fear and pain correlate at the psychosocial/emotional status (Alehagen, Wijma, Lundberg & Wijma, 2005:164).

The items are categorised in to three tables under a 0, 1 and 2 score, each item a total maximum score of 2 and a maximum score of 10 for the five items, similar to the well-known Apgar score. The 0 score represents mild pain, the 1 score moderate pain and the 2 score severe pain. To ensure the reliability and validity of the pain assessment

(compare the rating of the five items on the new instrument to an existing pain scale), the women in labour were asked to rate their pain on a Numerical Rating Scale (NRS) of 1 to 10, with the words 'no pain' at the end of number one and the word 'unbearable' at the end of number ten. Sketches of women in pain positions depicting each number on the NRS were drawn and attached to the instrument for illiterate patients and women who did not understand the rating scale. The draft instrument was submitted to testing in the form of a pilot study in a labour ward of a provincial and a private hospital to evaluate the feasibility of the instrument. Twenty-six midwives from the provincial hospital and 27 midwives from the private hospital completed the labour pain assessment tool during admission of the patient, at various suggested times, and at any other time they suspected the patient to be in severe pain. As determined by the statistician, the mean midwife pain rating was 5.7248 with the mean patient pain rating higher than the midwives at 6.9733. The correlation between the mean midwife and mean patient pain rating was .717, a positive relationship because the mean ratings of both the nurses and patients increase as labour progresses. The instrument proved feasible and was given to the focus group members to analyse and further refine. Figure 1 shows the piloted instrument developed from literature.

LABOUR PAIN ASSESSMENT INSTRUMENT							
Hospital: Private/Provincial Suggested time of assessment: Ethnicity: White/Black or coloured/Asian or Indian – Admission Social background: High income/Middle income/Lower income – 3-4cm cervical dilatation Support: None/Husband or partner/Midwife or doula/Other – 7-8cm cervical dilatation Age: _____ Gravity: _____ Parity: _____ - Before and 1 hour after administration of pain medication Onset of labour: _____h_____ - Any other time when in suspected severe pain							
Time Cervical dilatation Method of pain relief Length of labour							
Score	0	1	2				
Intensity							
Quality	aching miserable discomforting tender annoying	sore hurting tiring agonising intense	exhausting horrible unbearable excruciating overwhelming				

Behaviours/ physiological parameters	happiness excitement relaxation	muscular tension restlessness rising anxiety	crying out nausea/vomiting uncontrolled anxiety amnesia				
Fatigue threshold	normal activity normal eating normal voice	active/tired liquid intake little talking	fatigue/sleepiness no eating/drinking irritability confused				
Psychosocial/ emotional status	good support interaction normal anticipation some fear	rely on support more focused frustrated fear to be alone	little/no support interaction difficult discouraged horror when alone				
Patient rating no pain: 1---2---3---4---5---6---7---8---9---10 :unbearable							
1. 2. 3. 4. 5. 6. 7. 8. 9. 10.							
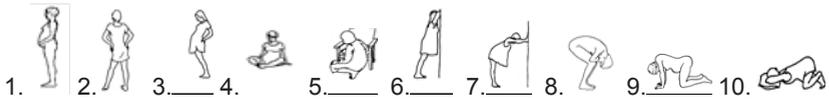
Figure 1: Labour pain assessment instrument compiled from the literature

FOCUS GROUP INTERVIEWS

The population of the focus group interviews comprised midwifery lecturers from three universities, midwives and advanced midwives from two public and two private hospitals, midwives in private practice and obstetricians in the Gauteng province. Purposive sampling (Polit & Beck, 2012:291) was used to select the focus group members who either possessed a qualification in Midwifery or Obstetrics and worked or lectured in Midwifery for at least two years prior to participation in the focus groups. At least two members of each focus group worked together in the same hospital or institution as this facilitated easier assembly of the specific interview. Each interview included at least two of the population groups, for example, lecturers and midwives.

Data collection

Based on data saturation, an independent moderator (Midwifery lecturer) conducted four qualitative focus group interviews, each consisting of four to six members between October and December 2009, to clarify the appropriate dimensions (items) to be included in the labour pain assessment instrument. An interview guide developed from the piloted instrument set the agenda and provided structure for the interviews. The

moderator received the interview guide well in advance to ensure she was comfortable with the instrument and understood how the focus group members had to evaluate the baseline data, suggested time of assessment, each item in the instrument and the pain rating. The instrument and written permission forms were handed out at the beginning of the focus group interviews and the group members were given 5 minutes to refresh themselves with the instrument. No explanation or information was given as to how it was designed in order to allow the members to evaluate the problems and shortcomings of the instrument at face value. The interviews of each focus group were conducted in university and hospital boardrooms where most of the group members worked. The times allocated for each focus group interview were flexible to further accommodate members without disrupting any services. All interviews were audio-recorded and field notes were taken by the researcher.

Data analysis

The first step was verbatim transcription. Data reduction steps, data display and verification followed as proposed by Miles and Huberman (1994:428–444). Interpretations of and inferring meaning from the data included comparison of the contrasts between the groups and noting of patterns and themes. The data was also compared with the field notes to cross-check data, interpret and identify deviance and minority opinions. Consensus was reached between the researcher and moderator during data verification that the content of the data was analysed accurately. Mixed method research can only achieve its full potential when the data is integrated (Polit & Beck, 2012:616).

Trustworthiness

The new labour pain assessment instrument encompasses the complex and multidimensional nature of labour pain and allows for pain assessment and reassessment of pain relief interventions. By using multiple types of data to refine the instrument, the interpretation of the instrument and truth value of the instrument are supported.

The framework of Lincoln and Guba (in Polit & Beck, 2012:584–585) was applied to enhance the trustworthiness of the focus group interviews. The truth value was addressed with credibility strategies such as prolonged engagement and reflexivity. Adequate time was allowed for the members to evaluate the items of the instrument and suggest new items. The field notes offered a vehicle for reflection about the research process and were discussed with the moderator who conducted the interviews. Applicability of the interviews was addressed with transferability strategies during sampling and a dense description. The members were selected on the basis of a reasonably high degree of homogeneity (regarded as very knowledgeable in the field of normal labour) to avoid pre-existing differences. Consistency related to the dependability of the dense description of the focus groups data and field notes. Neutrality eliminated the possibility that the researcher's prejudices may have influenced the data collection and analysis process.

The moderator conducted the focus group interviews to prevent researcher biases and preconceived assumptions to influence the data collection process. The moderator also confirmed the content of the focus group analysis. Confirmability captured the concept of objectivity with reflexivity and a confirmability audit.

RESULTS

The focus group interviews conducted in English with the lecturers, midwives and obstetrician lasted between 43 and 83 minutes. Data saturation was reached after the fourth focus group interview. The group sizes varied from four to six members and included members from various South African cultural groups. The focus group members welcomed a new labour pain assessment instrument and members of three groups noticed the resemblance of the instrument to the Apgar score.

Rating of the biographical data was not perceived to be as quick and easy. A tick block was suggested. The need was expressed to complete time, cervical dilatation, method of pain relief and duration of labour with every pain assessment as it influences pain control decisions. Members from three focus groups understood when pain should be assessed during labour. The third group did not have clarity as to when to assess the pain. A suggestion was made by the third group to move the 'suggested times of assessment' on the instrument directly below 'onset of labour'. A heading was needed to indicate that the midwife had to rate the items. The members of the third group asked if the instrument is self-reporting or a midwife assessment. Comments on problems and potential shortcomings of the five pain assessment items are displayed in Table 2.

Table 2:   Illustrative quotes from the focus groups of the five pain assessment items

Pain items	Quotes
Intensity	'Are they trying to say that, when the patient's standing and leaning like, she still tolerate the pain, and when she's in this position, it's wiped her over?' (Lecturer) 'The problem is here, what are the pictures .... What are they trying to tell us? I'm not able to understand this .... But here it's rare, because most of them are lying down and they are on the bed' (Public hospital midwives) 'Yeah because we all cope differently with, with positioning ourselves. And especially in government, I mean they are all flung back on their backs.' (Lecturer) 'Number two, that picture is not, doesn't for me .... My clients use that positions when they coping beautifully …. More a face would show it …. So, if somebody assessed your face, would they have been, wiser about as to how you were coping?' (Midwife in private practice) 'But how do I depict if they're not coping? I will think probably a face.' (Lecturer)

Quality	'The one that I miss in that zero quality, zero score, because she doesn't feel such severe discomfort, was comfort. (Lecturer) 'Don't we say that one of the hallmarks of going into labour is that the comfort zone changes?' (Midwife in private practice) 'We can't ask you the question, but, I always wonder what the evidence based of what you have in front of you. Is it locally based language that you are using? Where do these terms come from? Was it your own vocabulary? Does it have that meaning for you? What about the diversity of patients we serve, is it possible?' (Lecturer) 'I think what could work, is if a person goes back to that, especially that McGill pain instrument.' (Lecturer)
Behaviours/ physiological parameters	'Crying out I can see. Nausea and vomiting I can see. Uncontrolled anxiety I can see. I can't see amnesia.' (Midwife in private practice) 'I would just identify it if they're in pain, and you've not asked them a question, they would just like, not answer you, or ignore you. And it's not that they purposefully ignore you. It's that the pain is so much.' (Public hospital midwife)
Fatigue threshold	'In the beginning it's "normal activity", then "active or tired" and then it's "fatigue" and maybe "lying down" or, it's not necessarily "lying down", it can be "sitting down" as well. They don't want, not all of them want to be that active anymore.' (Obstetrician) 'I think we can put confusion with the, with the, the threshold of the person.' (Lecturer) 'When they are in severe pain, they just don't care about the surroundings.' (Public hospital midwife) 'What you could also maybe add is the breathing, how their breathing changes, spontaneously, could also maybe fit somewhere.' (Midwife in private practice)
Psychosocial/ emotional status	'I'm worried about "Good support", "Rely on support" and "Little or no support" as indicator of the severity of the pain. Maybe we oversimplify pain assessment.' (Lecturer) 'All women that are close to the end are emotionally dependant.' (Midwife in private practice) 'I think discouraged means also bitter. Cause they tired and they want to give up and they just feel that they can't go on any more.' (Midwife in private practice) 'The last one is "fear to be alone". I've never heard a patient expressing, e, to me (nè), um, for fear of being alone in the earlier stages of pain (nè). Because your extreme pain comes when she's near to labour." (Private hospital midwife) 'You don't need to be with them that much in the beginning stages, because they don't need you as much. But on this stage they do need you.' (Private hospital midwife)

Under 'Intensity', not all group members thought the pictures were clear and easy to understand. Members of two groups felt that patients are often restricted to bed

as they are being monitored with a cardiotocograph, which makes it difficult to read her body language. The members suggested that the pictures be replaced with a faces scale. No consensus was reached regarding 'Quality'. A group member was concerned about the number of words and suggested using only the word 'comfort' in the first block. Members of three focus groups accepted the 'Behaviours and physiological parameters'. A member suggested to include vital data, but the group agreed that vital data is unreliable as it is not possible to determine what can be regarded as 'normal' during labour. Concern regarding 'amnesia' was expressed. Adding of 'breathing' was suggested under 'Fatigue threshold'. The arguments of two groups regarding the word 'confused' led to more confusion. Three groups recognised the value of support as an indicator under 'Psychosocial and emotional status', but found the phrases 'good support', 'rely on support' and 'little or no support' confusing and advised to rephrase the words. The members disagreed with the words 'horror when alone' and suggested changing the entire fear aspect.

The patient rating scale and pictures provoked many comments. Members were uncertain how the scale and pictures were related to the instrument and who had to rate the pain. Two groups wanted zero added to the scale to accommodate 'no pain' and members from group three conducted in a public hospital suggested dividing the rating score into three categories, namely mild (1–3), strong (4–7) or very strong (8–10). This suggestion will be applied in the final instrument guidelines as pain management goals. All the groups agreed that the patient rating should be accompanied by instructions, a heading at the score and a total midwife and patient score. In general, the members stressed to keep the instrument simple and to develop guidelines for in-service training.

DELPHI TECHNIQUE

A Delphi technique survey followed in two rounds to evaluate the content of the labour pain assessment instrument for relevance, applicability and practicality, and identify new items. An open-ended questionnaire reflecting the content of the instrument was faxed or e-mailed with a cover letter to 17 most senior persons teaching midwifery at all South African universities to verify the content and structure of the draft instrument.

Data collection

The questionnaire consisted of the labour pain assessment instrument with a seven-point Likert scale added to offer a finite number of ranking options and a column after each assessment item for comments. The instrument was also attached. Eleven questionnaires were returned and the instrument was altered. The second questionnaire constituted the altered instrument and was mailed to the eleven experts who had completed the first Delphi round to evaluate and confirm the changes made during refinement of the instrument.

Data analysis

A statistician determined the mean ratings of each item on the Likert scale. Comments and suggestions of the first questionnaire were presented in another colour on a copy of the Delphi questionnaire. The comments of the first Delphi technique round were compared with the comments of the focus group interviews and integrated to enhance the credibility of instrument alteration. The responses of the second questionnaire were analysed, described and discussed in the same manner as the first questionnaire.

Validity and reliability

The seven-point Likert scale on the questionnaire to evaluate the face and content validity offered ranking options and a column to make comments. Refinement of the instrument focused on the truth value of the instrument to measure pain during labour. All suggested changes were submitted to a literature control before the instrument was altered.

RESULTS

The mean ratings of the experts in the first and second Delphi rounds are displayed in Table 3.

Table 3:   Delphi technique: Mean ratings of the instrument items

	First Delphi [n=11]	Second Delphi [n=6]
Instructions: Give a rating of 0, 1 or 2 for each Midwife rating that describes your patient's labour pain best before the patient rates her own pain.		6.00
Factors that may influence pain : Hospital: Private/Public	4.63	N/A
Factors that may influence pain : Ethnicity: White/Black or Colored/Asian or Indian	4.54	N/A
Factors that may influence pain : Social background: High income/Middle income/Lower income	3.90	N/A
Factors that may influence pain : Support: None/Husband or partner/Midwife or doula/Other	6.18	N/A
Factors that may influence pain : Age, gravity, parity	5.72	N/A
Factors that may influence pain : Onset of labour	6.00	N/A
Suggested time of assessment : Admission	6.10	6.83
Suggested time of assessment : Assessment of the progress of labour	6.33	6.16
Suggested time of assessment : Before administration of pain relief	6.22	6.83
Suggested time of assessment : One hour after administration of pain relief	6.22	6.16
Suggested time of assessment : Any other time when in suspected severe pain	6.54	6.66
Baseline data with every pain assessment : Date	6.00	6.83
Baseline data with every pain assessment : Time	6.81	6.83
Baseline data with every pain assessment : Cervical dilatation	6.81	6.40
Baseline data with every pain assessment : Method of pain relief	6.90	6.83
Baseline data with every pain assessment : Length of active labour	6.77	6.83
Midwife rating : 0, 1, 2	7.00	6.00
Intensity of pain : First Delphi: Standing, holding onto object, lying down	7.00	
Intensity of pain : Second Delphi: Smiley face, uncomfortable face, sad face	N/A	6.40

Quality of pain : Aching, Sore, Exhausted	6.83	4.75
Quality of pain : Miserable, Hurting, Horrible	6.28	3.00
Quality of pain : Discomforting, Tiring, Unbearable	6.42	3.00
Quality of pain : Tender, Agonising, Excruciating	6.25	3.00
Quality of pain : Annoying, Intense, Overwhelming	6.14	4.30
Behaviours/physiological parameters : Happiness, Muscular tension, Crying out	6.14	5.60
Behaviours/physiological parameters : Excitement, Restlessness, Nausea/vomiting	6.12	5.60
Behaviours/physiological parameters : Relaxation, Rising anxiety, Uncontrolled anxiety	6.42	5.60
Behaviours/physiological parameters : Amnesia	4.66	N/A
Fatigue threshold : Normal activity, Active/Tired, Fatigue/ Sleepiness	5.00	4.80
Fatigue threshold : Normal eating, Liquid intake, No eating/ drinking	5.42	5.20
Fatigue threshold : Normal voice, Little talking, Irritability	5.87	5.20
Fatigue threshold : Normal breathing, Rapid breathing, Uncontrolled breathing	5.33	5.60
Psychosocial/emotional status : Support sufficient, Rely on support, Support not effective	6.75	6.20
Psychosocial/emotional status : Interact normal, More focussed, Interact difficult	6.37	5.40
Psychosocial/emotional status : Anticipation, Frustrated, Discouraged	6.00	5.80
Psychosocial/emotional status : Some fear, Fear for unknown, Fear to be alone	6.50	6.40
Total midwife rating	N/A	4.00
Patient rating	6.83	6.25
Pictures	7.00	N/A

The ratings of the Delphi technique experts on the structural requirements that instruments under development should meet are displayed in Table 4.

Table 4:   Delphi technique: General structural requirements of the instrument

Overall structure of the instrument	First Delphi [n=11]		Second Delphi [n=6]	
	Yes	No	Yes	No
Quick and easy to implement	7	4	6	0
Cover all aspect of labour	4	5	4	2
Specifically aimed at the needs and problems for whom it was designed	7	3	5	1
Use acceptable to the patient	6	4	4	1
Structured	6	3	5	1
Useful during the first stage of labour	8	2	6	0
Assist with the formation of a pain assessment diagnosis	7	2	6	0

An expert emphasised that the resources and policies of a hospital determine how the birth place influences the labour pain experience. One expert indicated that the level of education is important as it empowers women. The experts stressed all patients should be supported by the person of choice. Factors that may influence the experience of pain during labour (biographical data) received more critique than support and were discarded after the first Delphi round, indicating the duration of active labour was regarded as important by all the experts. An expert was concerned about the wording 'before and one hour after administration of pain medication' under 'suggested time of assessment'. She suggested subdividing the assessment time. The experts also suggested adding instructions below the items as to whether the midwife or the patient should rate the pain.

The pictures under 'Intensity' were considered an interesting method to assess pain. Under 'Quality' an expert suggested combining 'unbearable' and 'excruciating'. The word 'miserable' was found difficult to rate. Two experts felt it would be difficult to determine 'amnesia' under 'Behaviours and physiological parameters'. An expert stated that fatigue does not cause 'confusion'. It was suggested to change 'support' and 'horror' under 'Psychosocial and emotional status'. The patient rating scale was perceived as appropriate, but the pictures were questioned.

The second Delphi round yielded less data than the first round and a sense of closure (saturation) was attained from the supportive comments and suggestions made. A Delphi expert commented: 'It just does not read easy' and suggested the following wording: 'Select the rating most applicable regarding each of the following parameters'. Positive opinions were conveyed and no suggestions were made under the five pain assessment items. Experts expressed their enthusiasm and appraisement for a new instrument to measure labour pain with comments such as: 'Congratulations, you've done very good work!'

Altered instrument

The view of the focus group members and first Delphi technique experts was that the biographical data (such as hospital and ethnicity) were not quick and easy to complete. The biographical data was therefore discarded. The date was charted above the time block on the instrument as labour is not bound to a 24-hour day. The 'Method of pain relief' block was enlarged to assist with easier recording. 'Length of labour' was changed to 'Length of active labour'. Suggested times of assessment were moved where the baseline data were omitted and the 'Before and 1 hour after administration of pain relief' assessment was divided into two separate times of assessment. The heading 'Score' was changed to 'Midwife rating' and an additional 'Total midwife rating' column was added after the last item for midwives to calculate a maximum score out of 10.

The five labour pain assessment items remained as proposed in the original instrument. The pictures under 'Intensity' were changed to a range of three visually depicted facial expressions. Midwives indicated during the interviews that they are familiar with the 'Faces Pain Scale'. The comments on the words under 'Quality' were viewed carefully and compared with the well-known McGill Pain Questionnaire (MPQ) in McLafferty and Farley (2008) from which words were grouped together to describe the increasing labour pain. No substantial grounds could be found from the literature to change the wording of quality. The word 'amnesia' under 'Behavioural and physiological parameters' was discarded as well as 'confused' under 'Fatigue threshold'. Breathing was included as it is a physiological characteristic associated with childbirth. The word 'support' under 'Psychosocial and emotional status' was described in more detail and 'horror' was changed to 'fear'. According to the fear-avoidance model in Flink, Mroczek, Sullivan & Linton (2009:315), pain is influenced by a range of emotional, cognitive, biological and behavioural factors. A woman in labour needs more support as pain intensifies.

A zero was added on the rating scale to accommodate 'no pain' and the 10 pictures were omitted as the experts could not correlate them to the level of pain on the NRS. Instructions on how to complete the instrument were inserted. Two pain rating examples in another colour were indicated on the instrument for midwives in the labour wards to see how to rate labour pain during testing of the instrument.

DISCUSSION

This study portrays the first phase of a complex process to develop, adopt and adjust a new multidimensional assessment instrument to measure pain during the first stage of labour. The value, extent and limitations of a variety of pain assessment and measurement instruments available to midwives were described. The tools either did not take into account the impact of variables such as self-efficacy, anxiety, analgesics and length of labour, or health professionals frequently focused on the occurrence and intensity of labour pain (Capogna, Camorcia, Stirparo, Valentini, Garassino & Farcomeni,

2010:169). Differences existed in the approaches of midwives to pain relief or between the pain ratings of clinicians and those of patients. Health care providers underestimated or overestimated labour pain in up to half of their patients (Winkelman *et al*., 2008:104). Labour pain is a multidimensional phenomenon with obstetric variables such as parity and progress of labour. The many pain descriptors in the existing instruments were too complicated to communicate and apply to the woman in labour.

A labour pain assessment instrument was developed from existing pain assessment instruments, pain literature and clinical experience. Subjecting the new instrument to focus group and Delphi Technique experts clarified the five assessment items included (O'Cathain, Murphy & Nicholl, 2007:85). Pain intensity can be evaluated using subjective reports of pain experiences (Da Silva, De Oliveira & Nobre, 2009:293). Contractions are often a few minutes apart and the faces used in the instrument can reflect the intensity of a particular contraction. Pain during labour reduces the quality of the birth experience (Christiaens & Bracke, 2007:2), and by describing quality of the pain with words, the patient shares her unique perception and view of her labour pain. Behavioural and physiological signs such as crying out loud, restlessness, nausea and vomiting, and muscle tension indicate distress, especially during the transitional phase of labour. Patients also express pain through body language such as restlessness, fidgeting, changing position and vocalisation when they may be crying, moaning, groaning and sighing (Bell, 2006:40). Childbirth demands large amounts of energy and childbirth-related fatigue has a cumulative effect especially during the active phase of labour (Tzeng *et al*., 2008:241). Dehydration, malnutrition and starvation, infection, a slow progress of labour, the length, strength and frequency of contractions, continuous or severe pain experienced over an extended period, and intense fear and anxiety are all factors influencing the woman's fatigue threshold. Other physiological phenomena such as nausea and vomiting, routine care such as vaginal examinations, personnel changes, and the unfamiliar environment can contribute to sensory overload in labour that may range from mild and tolerable to overwhelming. The psychosocial and emotional status of patients is influenced by a range of emotional, cognitive, biological and behavioural factors that may be associated with pain catastrophising that may heighten the labour pain experience (Flink *et al*., 2009:315). As pain is always what the patient says it is (McLafferty & Farley, 2008:42), the patient rating scale can empower a woman to indicate to what extent she is still capable of managing the pain.

In general the focus group and Delphi technique experts regarded the instrument as acceptable and aimed at the needs of the patient experiencing labour pain: The instrument is a point of departure to assess not only women's pain, but also progress labour.

CONCLUSION

Literature is saturated with papers stressing the need for better assessment and management of labour pain. Numerous pain measurement tools measuring chronic

and acute pain are currently in use, but many problems are encountered applying these methods to women in labour. A new instrument was developed to assess and document pain during labour. Refinement of the instrument revealed rich data that brought fourth substantial instrument alterations to facilitate easier assessment of labour pain. Furthermore, the labour pain experts concluded that the instrument was a simple tool that can measure labour pain. The experts not only pointed out meaningful potential problems that midwives may experience when assessing labour pain, but also inferred the instrument's usefulness in assessing pain, labour progress and the patient's condition during the first stage of labour (although it was not the initial purpose of the instrument).

RECOMMENDATIONS

Midwives assess labour pain to manage the pain. Based on the meaningful potential clinical problems that midwives may experience when using the refined labour pain assessment instrument, the instrument should be tested on patients in active labour to evaluate the validity and reliability of the instrument before implementation in midwifery practice. After assessment of labour pain in practice, clinical guidelines should be constructed to guide clinicians and midwives to select an appropriate pain relief method.

LIMITATIONS OF THE STUDY

Although the experts concluded the labour pain assessment instrument to be a useful instrument to assess and measure pain during the active phase of labour, too many descriptors of labour pain remained in the refined instrument. Future research can incorporate the perspectives of the patients as no input was obtained from patients who had given birth.

ACKNOWLEDGEMENTS

REFERENCES

Abushaikha, L. & Oweis, A. 2005. Labour pain experience and intensity: A Jordanian perspective. *International Journal of Nursing Practice,* 11:33–38.

Alehagen, S.I.W., Wijma, B., Lundberg, U.L.F. & Wijma, K. 2005. Fear, pain and stress hormones during childbirth. *Journal of Psychosomatic Obstetrics and Gynecology,* 26:153–165.

Bell, H.K. 2006. A pain assessment tool for patients with limited communication ability. *Nursing Standard,* 20:40–44.

Bird, J. 2005. Assessing pain in older people. *Nursing Standard,* 19:45–52.

Blackburn, M.L. & Waite, P.J. 2006. Instrument construction for measuring intention to obtain AED training. *American Journal of Health Study,* 21:133–136.

Camann, W. 2005. Editorials: Pain Relief During Labor. *The New England Journal of Medicine,* 352:718.

Capogna, G., Camorcia, M., Stirparo, S., Valentin, G., Garassino, A. & Farcomeni, A. 2010. Multidimensional evaluation of pain during early and late labor: A comparison of nulliparous and multiparous women. *International Journal of Obstetric Anesthesia*, 19:167–170.

Chang, M., Chen, C. & Huang, K. 2006. A comparison of massage effects on labor pain using the McGill Pain Questionnaire. *Journal of Nursing Research,* 14:190–196.

Christiaens, W. & Bracke, P. 2007. Assessment of social psychological determinants of satisfaction with childbirth in a cross-national perspective. *BioMed Central Health Services Research,* 7:26.

Da Silva, F.M.B., De Oliveira, S.M.J.V. & Nobre, M.R.C. 2009. A randomised controlled trial evaluating the effect of immersion bath on labour pain. *Midwifery,* 25:286–294.

Flink, I.K., Mroczek, M.Z., Sullivan, M.J.L. & Linton, S.J. 2009. Pain in childbirth and postpartum recovery – The role of catastrophizing. *European Journal of Pain,* 13:312–316.

Foster, R.L. 2007. State-of-the-art pain assessment and management. *Journal of Paediatric Nursing,* 12:137–138.

Gulliver, B.G., Fisher, J. & Roberts, L. 2008. A new way to assess pain in laboring women. *Nursing for Women's Health,* 12:406–408.

Jastrzab, G., Ker, S. & Fairbrother, G. 2009. Misinterpretation of the Faces Pain Scale-Revised in adult clinical practice. *Acute Pain,* 11:51–55.

Manworren, R.C.B. 2007. It's time to relieve children's pain. *Journal for Specialists in Pediatric Nursing,* 12:196–198.

McLafferty, E. & Farley, A. 2008. Assessing pain in patients. *Nursing Standard,* 22:42–46.

Miles, M.B. & Huberman, A.M. 1994. *Qualitative analysis: An expanded sourcebook*. 2nd Edition. Thousand Oaks: Sage.

Mohammad, K., Shaban, I., Homer, C. & Creedy, D., 2014. Women's satisfaction with hospital-based, intrapartum care: A Jordanian study. *International Journal of Nursing and Midwifery,* 6(3):32–39.

Nikkola, E., Laara, A., Hinkka, S., Ekblad, U., Kero, P. & Salonen, M. 2006. Patient-controlled epidural analgesia in labor does not always improve maternal satisfaction. *Acta Obstetricia et Gynecologica* 85:188–194.

Nystedt, A., Högberg, U. & Lundman, B. 2006. Some Swedish women's experiences of prolonged labour. *Midwifery*, 22:56–65.

O'Cathain, A.O., Murphy, E. & Nicholl, J. 2007. Why, and how, mixed methods research is undertaken in health services research in England: A mixed methods study. *BioMed Central Health Services Research*, 7:85.

Ogboli-Nwasor, E.O. & Adaji, S.E. 2014. Between pain and pleasure: Pregnant women's knowledge and preferences for pain relief in labour, a pilot study from Zaria, Northern Nigeria. *Saudi Journal of Anesthesia,* 8:20–24.

Ohel, I., Walfisch, A., Shitenberg, D., Sheiner, E. & Hallak, M. 2007. A rise in pain threshold during labor: A prospective clinical trial. *Pain*, 132:S104–S108.

Ong, K.S. & Seymour, R.A. 2004. Pain measurement in humans. *Surgeon*, 2(1):15–27.

Polit, D.F. & Beck, C.T. 2012. *Nursing research: Generating and assessing evidence for nursing practice*. 9th Edition. Philadelphia: Lippincott, William & Wilkins.

Rachmawati, I.N. 2012. Maternal reflection on labour pain management and influencing factors. *British Journal of Midwifery,* 20(4):263–269.

Roberts, L., Gulliver, B., Fisher, J. & Cloyes, K.G., 2010. The Coping With Labor Algorithm: An alternate pain assessment tool for the laboring woman. *Journal of Midwifery and Women's Health*, 55:107–116.

Rooks, J.P. 2012. Labor pain management other than neuraxial: What do we know and where do we go next? *Birth,* 39(4):318–322.

Tzeng, Y.L., Chao, Y.M.Y., Kuo, S.Y. & Teng, Y.K. 2008. Childbirth-related fatigue trajectories during labour. *Journal of Advanced Nursing*, 63(3):240–249.

Williams, A.C., Morris, J., Stevens, K., Gessler, S., Cella, M. & Baxter, J. 2013. What influences midwives in estimating labour pain? *European Journal of Pain,* 17:86–93.

Winkelman, C., Norman, D., Maloni, J.A. & Kless, J.R. 2008. Pain measurement during labor: Comparing the visual analog scale with dermatome assessment. *Applied Nursing Research*, 21:104–109.