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Patient Satisfaction with Non-Pharmacological Pain Management during Labour at a Midwife Obstetric Unit in a Peri-Urban South Africa - A Descriptive Cross-Sectional Study

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Abstract

Patient's satisfaction with pain management is vital for quality care. Therefore, pharmacological and non-pharmacological interventions do contribute significantly to pain control. The aim was to determine patients' satisfaction with non-pharmacological pain management in labour. A descriptive, cross-sectional design was conducted from June 2017 to March 2019. Participants were conveniently sampled to include 311 women three days after normal delivery. The research tools were Pain Satisfaction and American Pain Society Outcome Questionnaires were used to collect data. Univariate logistic regression was used to test for associations between variables. Findings of the study revealed a mean age of the women was 26.9 years, and 90.4% were Black, IsiZulu speakers, having two children and had secondary education. Moderate pain was experienced in 49.2%, and herbs or prayer were used by 55.3%. To relieve pain, participants reported deep breathing (26.2%), walking (22%), massage (21%) and prayer (14%). Effective pain relief was in 53.1%, while satisfaction was by 56.3%. The only statistically significant predictor of dissatisfaction was the number of live births (p=0.003). One live birth compared to four live births was more likely to be dissatisfied (OR=11.5; 95% CI 1.4-97.2). Findings suggest that non-pharmacological interventions are effective. The moderate pain experienced by a significant proportion may signify the need for pharmacological treatments. The association between low parity and dissatisfaction warrants further research.

Keywords: *Midwife Obstetric Unit, Pregnancy, Pain Management, Patient Satisfaction, Parity.*

Introduction

The Department of Health (DOH) in South Africa provides free medical services to all pregnant women at primary care levels and at hospitals, thus ensuring access to all pregnant women for safe delivery services [1]. The facilities that provide these services are community health centres (CHC) and are usually staffed by mid-wives and registered nurses with a doctor on-site if the need for their services should arise [1] The CHCs also have Midwife Obstetric Units (MOU), which means that they deliver basic obstetric services twenty-four hours a day and on average Phola Park CHC delivering 1623 babies annually. There are constant efforts to improve access and provision of maternity care, but little is done to address and improve the quality of maternity care in some countries [2].

Patient satisfaction has generally been measured using validated and reliable tools such as the Intrapartal Specific Quality from the Patient's Perspective Questionnaire and the Six Simple Questions (SSQ) or Perception of Care Adjective Checklist methods and so forth [3, 4, 5, 6]. Patient satisfaction is an important factor in a health system because it is also an indicator of the quality of health care provided by an institution [7]. In labour, pain is measured using

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the pain assessment scales, which are subjective measurements. These include the Visual Analogue Scale, the Numeric Rating Scale, Wong-Baker FACES Pain Rating Scale (and revised version), Brief Pain Inventory-Short Form, British Pain Society pain rating scale, Pain Quality Assessment Scale and McGill Pain Questionnaire Short Form [3-6].

Culture and ethnicity also played a role in the way people express pain or cope with it [8]. For example, women of Italian origin were found to be very vocally expressive of their pain, whilst Scandinavians were less vocal. African American patients were found to be more likely to verbally exaggerate their pain in comparison to their European American counterparts. A research project involving different ethnic groups measured how the groups responded to painful stimuli by measuring diffuse noxious inhibitory controls and found that African Americans had the least increase in noxious controls (suggesting a lower pain threshold [8]. A study done in Nigeria by [9] showed that women in labour in that country scored very low pain scores, which is contrary to the findings of the European studies.

Southeast Asian women managed very high levels of pain without even verbalising their discomfort and even declined analgesia when it was offered [2]. Different cultures also used different words to express their levels of pain, and this may be misinterpreted if the context is not understood. The pain of childbirth may be heightened by anxiety (due to the release of catecholamine and ultimately norepinephrine).[2] Excess amounts of these chemicals can lead to poor contractility of the uterus, which is why anxiety coping mechanisms must be encouraged for patients in labour. Studies show that emotional and physical support and advocacy (and the use of doulas) for the patient are instrumental in lowering anxiety levels. In some countries, religion also plays a role in pain management as spiritual belief positively affects the patient's ability to cope with anxiety and pain [2].

Analgesia should be offered to all women in labour unless they expressly refused it or the analgesia was contra-indicated for the mother or baby. However, researchers observed that the use of analgesia was not common practice in the centre and was hardly ever offered to patients in labour. Hence, it seems there existed provider-attitude problems with regards to pain relief in labour because there was no genuine reason why analgesia was not administered to their patients with regularity. Nevertheless, there were several forms of non-pharmacological methods that could have been offered to woman in labour. Judging by the way many patients were writhing in pain, it was assumed that either the women had forgotten about them or did not know about them. Researchers were particularly interested in knowing how women coped and managed with birthing pains as most of them appeared to suffer excruciating pains.

The purpose was to evaluate coping and managing of labour pain using non-pharmacological methods among women who presented to the MOU in labour. The aim was to assess patient satisfaction with labour pain management treatment options in the midwife obstetric unit at Phola Park CHC. Objectives were to describe the socio-demographics, the severity of pain experienced, the proportion of patients who were satisfied, and associations between socio-demographic characteristics and patient satisfaction with non-pharmacological pain management during labour.

Materials and Methods

Study Design

A descriptive cross-sectional design and review of patient delivery notes were utilized.

Study Site

The research was conducted in Ekurhuleni, South Africa, with a population of approximately four million. It is one of the three metropolitan municipalities in Gauteng [1]. The survey took place between June 2017

and March 2019. The study site was Phola Park Community Health Centre (CHC), which was a primary health care facility that provided free health care to children and pregnant women. Among other services, the CHC had a Midwife Obstetric Unit (MOU) that provided basic obstetric care at all hours. It had nine post-delivery beds, three delivery beds in the assessment room and a staff compliment of four doctors and twenty midwives that worked shifts. On average, the MOU delivered 1,623 babies annually [1].

Study Population

All women of reproductive age who delivered by normal vaginal delivery and utilised the obstetric services provided at Phola Park MOU over the period of the study.

Sample Size

On average, Phola Park CHC delivered 1,623 babies per annum. Using 95% confidence interval with a margin of error of 5% and 50% response rate, a minimal sample size of 311 was needed. This sample size was calculated using Raosoft formula, an online software application [10].

Selection of Participants

Patients aged at least 18 years, who had at least one live birth, were of any nationality, had delivered by normal vaginal delivery at Phola Park CHC and were attending their three-day post-partum check-up at the clinic were invited to participate in the study on that day. Complicated and high-risk patients who were successfully delivered at Phola Park CHC before they could be referred to the hospital were also selected for the study.

Inclusion and Exclusion Criteria

All mothers who delivered live babies by normal vaginal delivery at Phola Park CHC during the period of the study agreed to be a part of the study and signed the consent form were included. Those excluded were those who refused to participate, and were unable, by law, to sign consent forms, like those that needed a guardian's consent or had an intellectual disability. Also excluded were mothers who delivered soon after arrival at the MOU and whose progression was not monitored by MOU staff.

Sampling Technique

Patients were given information about the study, including study information, while in the post-natal waiting room. Women were invited to participate in the study and informed that participation was voluntary and would not harm them or their babies in any way. Patients were informed that should they decline to participate in the study, and then their refusal would not in any way influence the quality of care that they would get. Once a patient had completed answering the questions, they were thanked and asked to leave the room and another patient was invited to enter the room, and the same process was repeated. The researchers used a convenience sampling technique until we reached 311 participants.

Data Collection Tool

A validated questionnaire used in previous studies was adapted from the American Pain Society Patient Outcome Questionnaire and the universal pain assessment tool [54, 55]. The socio-demographic information on the questionnaire was modified, and this was done to add value to the questionnaire. The questionnaire was administered to the participants by the researcher. The first part of the questionnaire collected demographic information: patient reference number, date; gender; age; race; marital status, number of live births; the highest level of education, and home language. Information pertaining to the use of pain medication, traditional medication (or prayer water) and support during labour was also collected.

The second part of the questionnaire used the eleven-point rating scale to further enquire about: least and worst pain; pain over twenty-

four hours; how pain interfered with activities in and out of bed; how pain affected the sleep; how pain affected the mood and emotions; side effects from pain treatment; pain relief received; participation in pain treatment; satisfaction with results of treatment and information about treatment options. The last two sections of the questionnaire asked about the use of non-medical methods of pain relief (self-administered by the parturient) and how often patients were encouraged to use them. For those patients who did not speak English, the researcher sourced the assistance of a proficient interpreter to formulate the questions into local languages and back into English. All the respondents answered the same questionnaire which was in English. A pilot study was conducted involving 10 patients to adjust the questions and determine the average time to complete one questionnaire. These were not included in the final sample selected.

Data Collection

Parturient who presented to the clinic for their third day postpartum visit were asked where they had delivered and only those who had delivered at Phola Park were invited to be part of the study. Patients were seen in the post-natal department of the clinic and interviewed individually in a side ward for privacy and confidentiality. Interviewing the patients separately also allowed patients to feel comfortable so that they could answer truthfully and without knowing how other patients answered. We started with gathering of the patient's demographic data, personal details, age and parity and mode of delivery. They were also given an information form to sign as well as a global consent form. The patients then answered questions from the structured questionnaire that was administered by the researcher. Pain is a subjective feeling, and some patients may struggle to rate it, that's why a Universal Pain Assessment Chart with a numeric scale and Wong-Baker faces was used in assisting patients to rate their pain [11]. Participants were asked to verbally describe their pain experience, then to rate it using the pain scale.

Once a patient had completed answering the questions they were thanked and asked to leave the room and another patient was invited to enter the room and the same process was repeated. The patient's delivery notes were also reviewed during the third day of the antenatal check-up to see if they were given any medication during labour. The answered questionnaires were kept safely by the researcher in a locked office after the interviews had been conducted. The electronic copies of the raw data, collected daily from the questionnaires, were saved using a code only accessed by the researchers.

Data Analysis

We analyzed data using SAS (SAS Institute Inc, Carey, NC, USA), Release 9.4. A four-point Likert scale was categorized as satisfied or dissatisfied and the data was assigned to frequency tables. The categorical data was reported in terms of percentages, whereas the whereas the numerical data was reported as means and standard deviations. To test for significant relationships between demographic characteristics and satisfaction with pain management, a logistic regression analysis was performed with pain satisfaction (dissatisfied/satisfied) as a dependent variable and age, race, marital status, number of live births, education, and home language as independent as predictor variables. The p values of the Wald Chi-squared test were summarised in a table and statistical significance set at $p<0.05$.

Ethical Consideration

Approval was obtained from the University of Witwatersrand. Reference number was M 170608. and National Health Research Database number was GP_201711_002. Participation of patients in the research was voluntary. Patients were supplied with

information sheets that were also explained to them and a voluntary, signed consent was obtained before any of the participants could proceed with answering the questionnaire. All the participants were assured of confidentiality and anonymity of their responses and the questionnaires were answered with each patient individually and the results kept safely by the researcher.

Results

Table 1. Socio-demographic Characteristics

Characteristic	Frequency % (n=311)
Age (years)	
Mean (±SD)	26.9 (±6.04)
Median (IQR)	27 (21 – 31)
Minimum / Maximum	16 / 44
Race	
Black	281 (90.4%)
Coloured	30 (9.6%)
Marital status	
Married	116 (37.3%)
Single	118 (37.9%)
Separated	6 (1.9%)
Cohabiting	71 (22.8%)
Education	
Primary education	65 (20.9%)
Secondary education	188 (60.5%)
Post-secondary education	48 (15.4%)
University	10 (3.2%)
Home language	
IsiZulu	121 (38.9%)
South Sotho	78 (25.1%)
IsiXhosa	49 (15.8%)
Afrikaans	15 (4.8%
English	12 (3.9%)
Other (<4.0% each) *	36(11.5%)
Total	311 (100%)

*Other includes Xitsonga (8), North Sotho (6), Setswana (5), Tshi Venda (5), Shona (5), Chichewa (2), IsiNdebele (2), Siswati (1), Kalanga (1)

The above table shows a mean age of 26.9; the majority of participants were Black; equal number of married and single participants; most had secondary education and mainly spoke local language IsiZulu.

Table 2. Severity of Pain Experienced by Patients in Labour

Least pain experienced	Frequency % (n=311)	Worst pain experienced	Frequency % (n=311)
No pain	3 (1.0)	Moderate pain	1 (0.3)
Mild pain	71 (22.8)	Severe pain	45 (14.5)
Moderate pain	153 (49.2)	Very severe pain	136 (43.7)

Severe pain	73 (23.5)	Worst possible pain	129 (41.5)
Very severe pain	9 (2.9)	-	-
Worst possible pain	2 (0.6)	-	-
Total	311 (100)	Total	311 (100)

The above table shows that almost half of the patients felt that the least pain they experienced was nonetheless moderate in nature, whereas the worst pain experienced by less than half was very severe.

Table 3. Satisfaction with non-pharmacological Pain Management Treatment Options

Satisfaction	**Frequency % (n=311)**
Extremely dissatisfied	7 (2.2)
Very dissatisfied	13 (4.2)
Dissatisfied	41 (13.2)
Satisfied	70 (22.5)
Very satisfied	175 (56.3)
Extremely satisfied	5 (1.6)
Total	311 (100)

The above table shows 80.4% (n=250) of the patients were satisfied and 61% (n=19.6) dissatisfied with their pain management in the MOU.

Table 4. Non-pharmacological Pain Relief Options used by Participants

Pain relief option	**Frequency % (n= 311)**
Deep breathing	291 (26.2)
Walking	244 (22.0)
Massage	233 (21.0)
Prayer	157 (14.1)
Heat	111 (10.0)
Listen to music	32 (2.9)
Relaxation	19 (1.7)
Distraction (e.g., watching TV, reading)	13 (1.2)
Cold pack	8 (0.7)
Imagery or visualisation	2 (0.2)
Total number of times methods were reported	1110 (100%)

The above Table depicts the most frequently used non-medical pain relief options were deep breathing (26.2%), walking (22.0%) and massage (21.0%) in that order.

Table 5. Odds Ratio (OR) and Confidence Interval (CI) as a Significant Predictor of Dissatisfaction

Number of live births	**OR**	**CI (95%)**
1	11.5	1.4 – 97.2
2	3.8	0.5 – 30.4
3	2.4	0.3 – 17.3

The above table shows that the less the parity, the more likely the dissatisfaction amongst the participants.

1. Patients with 1 live birth were 11.5 times more likely dissatisfied compared those with 4 live births.
2. Patients with 2 live births were 3.8 times more likely dissatisfied compared to those with 4 live births.
3. Patients with 3 live births were 2.4 times more likely dissatisfied compared to those with 4 live births.

4. Number of live births delivered by participants.

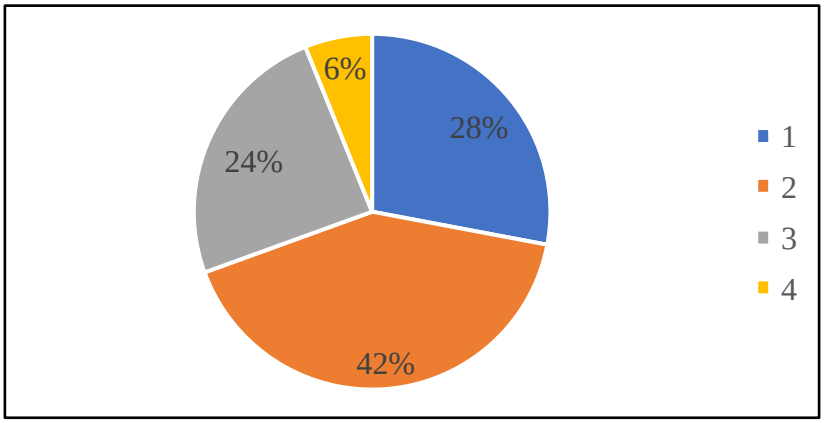

Figure 1. Number of live births

The above figure shows most participants had two live births and a minority had four or more births. The number of live births was the only statistically significant predictor of dissatisfaction (p=0.003).

Discussion

Sociodemographic Characteristics

The World Health Organization refers to all females between the ages of 15-49 as women of reproductive age [12]. Age is a relevant factor in our study because women between the age groups of 19 to 24 are more likely to have greater control of pain than women over the age of 30. This ability to manage pain amongst the younger age groups is due to their physical endurance and their general physique [13]. A study by Kigenyi did not find age to be a statistically significant finding in relation to how patients rated their pain satisfaction outcomes [14]. Our study, also, did not find age to be a statistically significant factor with respect to satisfaction with pain management (p=0.311). The findings could be explained on the basis that the body is programmed to feel pain as a response to an unwanted stimulus. Hence, being young or old is irrelevant, as pain will elicit a response at any age.

Studies conducted in Nigeria and Ghana reported that participants felt pain was the path that every woman endured as a rite of passage [15, 16]. They corroborated the belief amongst Nigerians that using analgesia for labour pain was a sign of weakness as labour pain was meant to be endured without any form of pharmacological pain relief [16, 17]. Such approaches to managing labour pains maybe be attributed to ethnicity, cultural beliefs, and ignorance about the available pain relief methods in birth setting [17]. Our study showed that race was not a significant factor in patient satisfaction (Table 1).

Home language was not a statistical predictor of dissatisfaction in our study (Table 1). Although languages may be different, South African culture and beliefs were intertwined and shared many major similarities which may explain the insignificance of language as a predictor of dissatisfaction. A study by Olayemi showed different results compared to our study, by suggesting that ethnicity may have had a bearing on how patients perceived and dealt with labour pain [9]. Our findings, however, did not concur with previous studies by Emelonye and Steel who reported that married women were more likely to report positive experience [18, 19]. Despite being married and sometimes willing to take active part in the delivery process, the African male may still be hindered by societal norms and prejudices about a man's role during labour**.**

Further, evidence shows that although multiparous women were less likely to request the use of pharmacological pain management in labour, they were more likely to report better satisfaction rates with pain management [15,

20]. This may be attributed to parturient who experienced labour before and knew what to expect. Multiparous parturient may have also witnessed resuscitations of babies whose mothers had received pharmacological pain relief. This might also explain the reluctance of these mothers to accept pharmacological pain relief. These findings align with our study which showed that the number of live births was a statistically significant predictor of dissatisfaction (Figure. 1). The less the parity, the more likely they were to be dissatisfied with their pain management. Despite the finding, the confidence interval was quite wide, meaning the finding must be taken with caution.

The level of education was not a statistical predictor of dissatisfaction (Table 1) in the current study. However, [19, 21] showed respondents with a higher education level were less likely to request or use pharmacological pain relief whilst in labour, despite not using any form of medical relief option. Also, they were more likely to be satisfied with their overall management of pain in labour. These studies found that a higher education may also be associated higher pain perception levels than those patients who were less educated.

Severity of Pain Experienced by Patients in Labour

Pain intensity is a major factor with regards to pain management in labour [22]. When questioned about pain intensity, namely, the least pain they had experienced, almost half of the participants felt the pains were at best, still moderate (Table 2). Hence, it may be prudent to introduce combinations of non-pharmacological and pharmacological pain management plans at clinic level to those parturient who are willing to try out both methods. Another alternative would be to introduce a combination measure, such as non-opioids, deep breathing, massage, and heat together. These measures would, however, require the presence of Doulas or additional staff in the MOU. Our study findings are in keeping with findings by Akadri who showed that most of the participants rated their labour pains as moderate or severe [21].

Satisfaction with pain treatment during labour

The pharmacological options available in clinics, as per the South African maternal guidelines, provided for the administration of pethidine, phenergan, or entonox for pain relief in labour [19]. In our centre, pethidine and phenergan were available for the patients. Pethidine remains one of the most used opioids in the management of pain and is used in most countries throughout the world. It is relatively inexpensive and is easy to administer and can be prescribed and administered by a midwife, which makes its use widespread in obstetric units [23]. Smith found that satisfaction with pain relief from pethidine in labouring mothers was moderate and it caused side effects such as itching, vomiting or nausea [23].

Under half of the participants reported to have taken prayer water or traditional medicine (Table 3). This was quite a substantial, which shows patients' propensity to believing in the use of non-conventional pain relief options. This might be because parturient may be from households where traditional medicine was used regularly. The use of prayer water might stem from predominantly Christian nature of patients and substances such as prayer water may be considered as harmless to the mother and child. It may therefore be prudent to improve parturient knowledge on the available pain management options and risks associated with traditional medicine. Our study findings are like those by [24, 25] which showed that religion was an integral part of the labour process.

Non-pharmacological Pain Relief Options

Deep Breathing

Our participants favoured the breathing technique which was indicative of the effectiveness of the method (Table 4). This was

backed by Yuksel's study which showed that breathing exercises was an effective way to reduce labour pains and significantly minimized the duration of labour. [26]. A reason for the increased popularity of breathing techniques could be due to its ease of use. A study by Nattah corroborated our findings well. The study recorded women's pain scores using the visual analogue scale against breathing techniques in labour and showed those who used the breathing technique correctly recorded the lowest pain scores [27].

Walking

The usefulness of walking around when in labour was a common and popular feature of our participants. They may have used walking as a way of distracting themselves from the labour pains and to move away from other parturient who are moaning in pain. Walking is also believed to give the patient a sense of control over her labour pains and works as way of distracting her from the labour pains and decreasing the needs for pharmacological interventions [28]. Ondeck supported the need to walk around whilst in labour and concurs with the findings of by Melzak and Lawrence that demonstrated that walking resulted in shorter labour periods and increased satisfaction with the labour process [28, 29, 30]. The walking in labour at our centre could be higher but might have been hampered by institutional routines that don't always encourage labouring patients to walk, lest they delivered out of sight of medical personnel.

Massage

This was a popular form of pain relief in our study. Participants reported it was a way of easing the pain whilst in labour. This method may have proved popular with our participants due to its ease of application and possible effectiveness in reducing the perception of labour pains. Levett wrote that massage could assist with pain relief if done gently in between contractions (for release of endorphins and relaxation) or by applying stronger pressure on the buttocks (which is believed to interrupt the transfer of pain during contractions and to relieve the actual pain [31].

Prayer

Participants reported to praying for themselves to help them through the labour pains, which confirms the findings of previous studies. Prayer and artefacts associated with God were commonly encountered amongst a lot of patients in labour. Studies by [15, 25] showed that patients had the belief of being under the protection of a higher being that it could assist in easing the labour pain and resulting in an uneventful delivery.

Heat

Participants attributed the easing of labour pains to the use of heat, which aligned to previous studies on the effectiveness of heat on labour pain. The use of heat on the lower back, abdomen and perineum was a cost effective, low risk and easy to use method of reducing labour pains as demonstrated in one study. Women who used heat packs in labour had much lower pain scores, shorter labour period and better labour satisfaction outcomes [32]. Our study findings agree with [32, 33] who showed that many patients in labour found self-application of heat packs on the lower back effectively decreased the intensity of labour pains [32, 33]. A study by Ganji went further to assess the effect of intermittent heat and cold on the labour process and found that the method also led to decreased labour times and pains, leading to increased satisfaction [34].

Association between Sociodemographic Features and Patient Satisfaction

Our study did not reveal any significant relationship between the demographic features (age, race, marital status, education, and home language) except for number of live births. Hence, these variables were less likely significant predictors of dissatisfaction. The number of live births was the only significant finding as a predictor of dissatisfaction (Figure.

1). Our results show that the less the parity of our participants, the more likely they were to be dissatisfied with their pain management. However, for those participants with one live birth, a wide confidence interval suggests results should be considered with caution. For participants with three live births, the confidence interval was narrower, which gives more confidence in the findings.

Bias and Limitations

The study may have been affected by social desirability bias because participants might have answered in a manner that over-estimated or under-estimated their satisfaction with pain management to conform to what could be considered more socially acceptable [74]. Therefore, the researchers explained to the respondents to answer truthfully, without fear as their answers would be anonymous and in no way affect the manner in which they would be helped. They were informed that truthful answers would assist in improving management for all patients in labour. Although mothers were asked to answer truthfully to these questions, the researchers were non-judgemental.

Convenience sampling was used, and our study population was selected from only one geographical location, which may make findings not truly representative of the rest of the country. Those parturient who delivered at the clinic but did not come back for their postpartum review were excluded, more especially if they were dissatisfied with the care that they had received. This exclusion may result in overestimation of satisfaction or underestimation of dissatisfaction. The rating of pain perceptions in individuals is a limitation because of the subjectivity and absence of a better and more objective pain perception tool. However, the current tool is still the best-known way of rating.

Conclusion and Recommendations

Our research findings suggest that non-pharmacological pain management interventions are effective and have a role to play in labour. However, a significant proportion of participants still experienced at least moderate pain may signify the need for additional pharmacological treatments. While sociodemographic characteristics appear not to influence parturient satisfaction, the finding that women with lower parity were more likely to be dissatisfied with their pain management during labour warrants further studies.

Additional recommendations should have the buy-in of the MOU staff, which should be upskilled in the ordering, use and knowledge of appropriate doses of pethidine for patients in labour. Heat packs, birthing balls and calming music should be made available at the centre. At the patient level, interventions should include teaching and advising patients on negotiated delivery plans, and educating patients on the available pharmacological methods in the clinic. When patients arrive in labour, they should be given information on available medical pain relief options. Pethidine is not being offered to patients, and this should be done. Community-level interventions should aim at the use of radio, television, print and social media and to create awareness on the different methods of pain relief available.

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