COLLEGE OF MEDICINE AND HEALTH SCIENCE

DEPARTMENT OF ANESTHESIA AND ANESTHESIOLOGY

TITLE: - ASSESSMENT OF QUALITY OF POSTOPERATIVE PAIN MANAGEMENT AMONG MOTHERS WHO UNDERWENT CAESEREAN SECTION UNDER SPINAL ANESTHESIA AT SELECTED HOSPITALS OF SIDAMA REGION, IN 2024, MULTICENTER PROSPECTIVE COHORT STUDY.

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A THESIS TO BE SUBMITTED TO HAWASSA UNIVERSITY COLLEGE OF MEDICINE AND HEALTH SCIENCE, DEPARTEMENT OF ANESTHESIA AND ANESTHESIOLOGY, IN PARTIAL FULFILMENT OF THE REQUIREMENT FOR MASTER OF SCIENCE (MSc) IN ADVANCED CLINICAL ANESTHESIA.

JUNE 2024

HAWASSA ETHIOPIA

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ADVISORS' APPROVAL SHEET

SCHOOL OF GRADUATE STUDIES

HAWASSA UNIVERSITY ADVISORS' APPROVAL SHEET

(Submission Sheet-1)

This thesis entitled, "Assessment of quality of postoperative pain management among mother underwent caesarean section under spinal anesthesia at selected hospitals of sidama region, Ethiopia, in 2024, Multicenter prospective cohort study." prepared and submitted by Thomas Ameno MSc anesthesia student for partial fulfillment of a master of Science (MSc) degree in advanced clinical anesthesia has been carried out under our supervision. There for we recommend that the student has fulfilled the requirement and hence hereby can submit the thesis to the department.

Name of advisors	Signature	Date
1. Getu Ataro (MSc, MHPE, Asst Professor)	_____	_____
2. K/Mariam Tamirat (BSc, MSc in anesthesia)	_____	_____

Examiner's APPROVAL SHEET-I

SCHOOL OF GRADUATE STUDIES

HAWASSA UNIVERSITY EXAMINERS' APPROVAL SHEET-1

(Submission Sheet-2)

We, members of the Board of Examiners of the final open defense have read and examined the thesis entitled "Assessment of quality of postoperative pain management among mother underwent caesarean section under spinal anesthesia at selected hospitals of sidama region, Ethiopia, in 2024" prepared and submitted by Thomas Ameno MSc anesthesia student for partial fulfillment of a master of Science (MSc) degree in advanced clinical anesthesia. This is, therefore, to certify that the thesis has been accepted in partial fulfillment of the requirements for the degree.

_____	_____	_____
Major Advisor	Signature	Date
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Internal Examiner-II	Signature	Date
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SGS Approval	Signature	Date

Acknowledgment

I would like to thank to Almighty God for giving me health to start and write this thesis paper. Next, my special thanks go to my advisors Mr. Getu Ataro (MSc, MHPE, Asst prof of Anesthesia), K/Mariam Tamirat (MSc, Lecturer of Anesthesia) for giving me guidance, direction on throughout the thesis work.

Furthermore, I am grateful to the Department of Anesthesia and Hawassa University College of Medicine and Health science for providing me the opportunity to conduct this thesis. Lastly, I would like to thank, those authors and researchers of articles for the valuable works I have read and cited.

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Abbreviations and acronyms

AOR – Adjusted odd ratio

APAIS – Amsterdam Preoperative Anxiety and Information Scale (APAIS)

APS – American pain society

ASA – American societies of Anesthesiologist

BMI – Body mass index

CI – Confidence interval

COR – Crude odd ratio

C/S – Caesarean section

DC – Data collector

HCPs – Health care providers

HUCSH – Hawassa university comprehensive specialized hospital

IRB – Institutional review board

POPM – Postoperative pain management

NRS – Numeric rating scale

SCQIPP – Strategic and clinical quality indicators postoperative pain

WHO – World health organization

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Abstract

Introduction: Caesarean section is the most common delivery procedure in the world, and pain is a major problem in the postoperative period. Postoperative pain management outcomes and satisfactions with pain management have been important indicators to evaluate the quality of postoperative pain management. The best way of quality assessment of postoperative pain management is based on patients self-report.

Objectives: To assess quality of postoperative pain management among mothers who underwent caesarean section within the 1st, 6, 12 and 24 postoperative hours among mothers taking spinal anesthesia at study area, Ethiopia in 2024.

Methods: A prospective cohort study was conducted from February 2024 to May 2024 at multicenter. Pretested questionnaires were used to collect data until 24 hours after surgery. SPSS version 20 was used to code, input, validate, and analyze the data. Socio-demographic data and pain severity were summarized using descriptive statistics. Both bivariate and multivariable logistic regression analysis were done to evaluate the association between independent and dependent variable. For variables with a p-value < 0.25, multivariable logistic regression was performed. A P-value < 0.05 was considered as statistically significant.

Result: Total 264 mothers participated in this study. The number of participants at the level of good quality and not good quality of postoperative pain management were 11(4.17%) and 253(95.83%) respectively. Education/Orientation on preoperative about anesthesia and operation (AOR, 6.856, 95% CI: 1.344-34.980), Adjuvant added with bupivacaine (AOR: 5.909, 95% CI: 1.314-26.570), and Nerve block done at the end of procedure (AOR: 4.643, 95% CI: 1.075-20.050), were all significantly associated with postoperative pain.

Conclusion and recommendation: In this study, general quality of postoperative pain management was poor. Factors like Orientation on preoperative about anesthesia and operation, Adjuvant added, and nerve block done were predictors for quality of postoperative pain management. The practice of performing nerve block and adding adjuvant to a spinal local anesthetic agent were significantly increased the quality of postoperative pain management.

CHAPTER ONE: INTRODUCTION

1.1 BACKGROUNG

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, and characterized by physical, sensory, behavioral, socio-cultural, psychological factors and is the biggest anticipated problem in the postoperative period(1). Postoperative pain is common among women who underwent cesarean section(2). In case of direct nerve lesion, or indeed strain or contraction, neuropathic pain can also be present(3).

Cesarean section is one of the most common surgeries in women of childbirth age, which demand additional attention(4). In addition, this procedure takes place at a time of considerable hormonal and emotional changes related to the gestation and appearance of the baby, which can negatively impact the postoperative pain, in view of the multidimensional nature of this experience(5). The severity of postoperative acute pain after cesarean section varies due to different factors such as, marital status, previous c/s, preoperative anxiety, incision type, and anesthesia and surgery related factors(6).

Cesarean delivery rates are increasing worldwide, and effective postoperative pain management is a key priority of women undergoing cesarean delivery(7). Information on service provision, preoperative planning, pain assessment, and pharmacological and non-pharmacological strategies are relevant to increase quality of acute postoperative pain management(8).

In addition to advanced pain treatment, patient participation in decision-making, was important to improve the quality of postoperative pain management(9). Pain management outcomes and satisfaction with pain management have been important indicators to estimate the quality of health care in pain management(10).

There's no ‘gold standard’ for post-CS pain management. Options are somewhat determined by, individual preferences, drug availability, resource limitations and financial considerations and substantially determine on opioids, supplemented with anti-inflammatory drugs, nerve block or other additive techniques(11,12).

The American Pain Society (APS) recommends that to improve the quality of postoperative pain management, focus should be put on the severity of pain and the effects of pain on patient

outcome(13). Self-reporting pain assessment is one of the most accurate way; from this, the numerical rating scale (NRS) is easy or less complicated to understand(14). To assess preoperative anxiety, we used Amsterdam Preoperative Anxiety and Information Scale (APAIS) which was developed in 1996 by Dutch group of Moermann, the high acceptance of the APAIS by patients was proven in different studies from which reference values (M, SD, Cut-offs) are available for different groups of patients. This questionnaire consists of six items and is, therefore, an economical instrument.(15).

A clinical practice guideline from the American society of regional anesthesia and pain medicine reported that, six quality indicators were recommended to increase the quality of pain management(16). These indicators are as follows recording the severity of pain with a numerical rating scale (NRS) or a verbal descriptor scale at frequent intervals, management of pain with treatment styles other than intramuscular injection styles, regular pain management, pain relief, management of pain to improve the quality of life and activities of daily living, and informing patients about pain and pain management.

Inadequately treated post- operative pain can delay patients' recovery and capability to return to daily activities. Early recovery is especially important for a patients who has to care for a newborn soon after surgery(17,18).

1.2. Statements of problem

Caesarean section is the most common delivery procedure in the world, and pain is a major problem in the postoperative period(19). During the last three decades, spinal anesthesia has become the favored anesthesia for better fetal and maternal outcomes in caesarean sections. Still, the main disadvantage of spinal anesthesia is the lack of permanent postoperative analgesia, which requires the administration of additional anti-pain(20,21).

Postoperative pain management practice is below the standard and complex in developing countries because health care systems are poorly developed, lack of patient education about pain (expectation), problems in accessing analgesia, and lack of access to infrastructure compared to developed countries(22).

Previous study has shown that mothers who underwent caesarean section had 85.5% chance of experiencing moderate to severe pain, suggesting that pain management needs improvement(23).

Despite of high prevalence of postoperative pain after cesarean section, there were no literatures which assess the quality of postoperative pain management after cesarean section. Poor management of acute postoperative pain after caesarean- section is one of the most common problems in the world, especially in developing countries which has economic, and psychological problems on patients and increases the chance of developing chronic pain(1,24).

Millions worldwide unnecessarily suffer from untreated pain. This burden is highest in the developing world, and among the poor, elderly, mentally ill, children, and women(25). Although pain management continues to be a problem in both developed and developing countries, sadly the suffering from untreated pain is larger and further worrisome among the economically less developed countries(26).

This applies especially to those from the least developed countries, such as Ethiopia, where there's still no scientific interest in the quality of postoperative pain treatment(27). Studies have shown that Poor treatment of acute postoperative pain can contribute to medical complications similar as deep venous thrombosis, pneumonia, infection, chronic pain, and depression(28).

1.3. Significance of study

Untreated postoperative pain has dangerous consequences, ranging from prolonged duration of the hospital stay to more severe complications, such as chronic pain, atelectasis, respiratory infection, myocardial infarction and indeed death(25,28).

Hence, this study is applicable to society because it gives a voice to the voiceless postoperative patient in low- resource settings. Despite different ways of postoperative pain control have been provided to surgical patient, there had been lack of evidence that examined the quality of postoperative pain management.

Because there's no study done in our study area as well as in Ethiopia, which assesse the quality of postoperative pain management after cesarean section, this study will contribute to enhancement in the quality of care by assessing patients' pain experiences with standard tools, determining the areas necessary for the enhancement of care, relating and enforcing effective nursing interventions, and determining patients' satisfaction with pain management. Although the high incidence of post caesarean section pain, most responsible health professions in my

observation do not give a high value on management of postoperative pain. This research increases their awareness of the issue.

There is no published research with similar topics and with similar population in Ethiopia, as well as in our study area, so the outcome of this study will use as the source of information for other researchers and drafting pain management protocols to improve quality of postoperative pain management.

The aim of the study was to assess quality of postoperative pain management among mother undergo caesarean section under spinal anesthesia.

CHAPTER TWO: LITERATURE REVIEW

2.1. Incidence of postoperative pain

Incidence of postoperative pain is a new health condition or events (such as pain) that occurs in a population that is both previously free of the condition and at risk for experiencing it over a specified period for the population at risk for the event. In medicine, the incidence of postoperative pain is commonly the newly or acute pain per population due to skin incision, traction and manipulation during surgical procedures at risk over a specified timeframe(29).

An institutional-based prospective observational study was conducted on parturient that had undergone cesarean section in Gandhi Memorial Hospital from 1 December 2019 to 28 February 2020. In the study with a response rate of 98, assessed the incidence of postoperative pain in 290 parturient that had undergo CS. In this study, incidence of moderate- to-severe pain has been fund as 53.4%, 75.9%, and 52.8% at 2, 12, and 24 h, respectively(6).

Study that investigated the quality of postoperative pain management in Jimma University also reported moderate to severe pain as 88.2%, the study which was conducted in Jimma included other general surgery procedures other than CS, and therefore might cause further incidence of postoperative pain(27).

There's also another study conducted in South Africa on surgical patients consisting of CS, from those total procedures cases with CS had reported the largest incidences (87%) of moderate- to-severe acute postoperative pain(26).

Another descriptive survey conducted in Sweden in women undergo cesarean delivery reported about 78% of moderate- to-severe pain with a score of ⩾ 4 on the VAS indicating pain as ineffectively treated(30). Another longitudinal study in Brazil on 1062 women underwent CS reported a high prevalence (78.4%) of moderate- to-severe acute postoperative pain(31).

Postoperative moderate- to-severe acute pain after CS was also conducted in a sample of 1288 women delved by a prospective follow-up study in New York, where the prevalence within 36hr post-delivery was 10.9, which shows lower incidences this is due to availability of adequate analgesic drugs, infrastructure and trained health professions(32).

2.3. Predictors for quality of postoperative pain management

A predictor in quality of postoperative pain management is a circumstance, or event that occurs while an action is taking place that favors quality of postoperative pain (positive or negative).The other name of predictor variable is an independent variable, which is an input or factor that is being used to explain the variability in the dependent variable or to predict future values of the dependent variable(33).

Study conducted in Ethiopia in 2020 by dagim et al reported that, History of previous cesarean section, preoperative anxiety, transverse incision, and incision length> 10 cm were the factors of postoperative pain after cesarean section(6).

Prospective longitudinal study done in Brazil in 2016 reported that, preoperative anxiety increased moderate to-severe acute postoperative pain after CS was 1.6 times than those who weren't anxious, this was due to psychological change that included anxiety, frustration, and other emotional responses that had an influence on patient recovery which means high preoperative anxiety can affect in moderate- to-severe pain in the postoperative period and decrease quality of postoperative pain management (31).

The study that was done in Thailand in 2017; it was a prospective double blinded randomized-controlled trial that compared the prevalence of postoperative pain in both perpendicular(midline) and Pfannenstiel(transverse) incision group. It eventually set up that in repeated CS, incidence of postoperative pain was advanced in Pfannenstiel(transverse) group than perpendicular(midline) group at 6 and 12 h postoperatively; but in first CS, the incidence of pain was advanced in perpendicular(midline) group than Pfannenstiel(transverse) group(34).

From February 1 to September 30 in 2021, a hospital-based cross-sectional study was conducted among women who underwent cesarean section at Hawassa University Comprehensive Specialized Hospital the duration of procedure was independent predictors for postoperative pain. The moderate to severe postoperative pain were higher in parturient whose procedure took more than 60 min than parturient whose procedure took less than 60 min(35). This finding was in congruence with a study done in Singapore in 2018, reported that factors associated with moderate to severe postoperative pain included younger age, same day admissions, duration of operation >2 h(36).

A hospital based cross sectional study was conducted on all patients who came to Gondar university hospital, Ethiopia in 2013 reported that, "the younger the more painful", those <60 are 2 times more likely to report moderate to severe pain than the elders. Research done in Spain for predictors of post-operative pain in abdominal procedures also puts age (OR=4.72) as a major factor for postoperative pain(37).

A hospital based cross sectional study was conducted on all patients who came to Gondar university hospital, Ethiopia in 2013 reported that ASA I and II patients have much more complaints of severe pain than do ASA III and IV(37). European Journal of pain (London, England) reported that Moderate to intense acute postoperative pain was associated with ASA III (odds ratio (OR) 1.99)(38).

2.4. Quality of postoperative pain management

Quality of care in postoperative is the degree to which the treatment increases the patient's chances of achieving the desired results and decreases the chances of adverse results(39). Quality of postoperative pain management is the degree to which health services for individuals and populations increase the chance of desired health outcomes and are reliable with current professional knowledge in terms of postoperative pain management and other health care services(40).

In the study which was done previously, the magnitude of pain could appear from relations of miscellaneous but interrelated factors. First, the poor knowledge of health care providers (HCPs) about pain and their attitude towards it play a role(41). A national wide study conducted in Ethiopia confirmed this finding according to this report; the majority of HCPs were not

competent in either treating or assessing pain. Second, a lack of organizational commitment, resources, and supervision could also aggravate the high prevalence of pain in hospitalized patients(25). Third, some authors argue that high pain scores are a consequence of inadequate dose of anesthetics(42).

Sherwood et al emphasized that patients show greater pleasure with postoperative treatment of acute pain if they were educated through early nursing interventions how to treat their pain, how to be active partner in planning of their postoperative pain management(43).

Achieving the quality of pain management is dependent on multidimensional factors, which requires the involvement in all aspects of care players, including nurses, patients and physicians and having a uniform guidelines and protocols. The study conducted in Europe by Dragan et al indicated that lack of regular assessment of pain intensity and follow- up of effects of analgesic drugs in professional nursing care, significant factors which impact the quality of acute postoperative pain managements(44).

A study conducted in Iceland reported that 70% of patients didn't gate information on pain treatment options(9). Currently, it's explosively recommended to give preoperative information to patients to improve acute postoperative pain management(16). As those patients who entered preoperative information have lower preoperative anxiety and thus lower postoperative pain intensity and which increases quality of postoperative pain management(45).

Figure 1 Conceptual framework

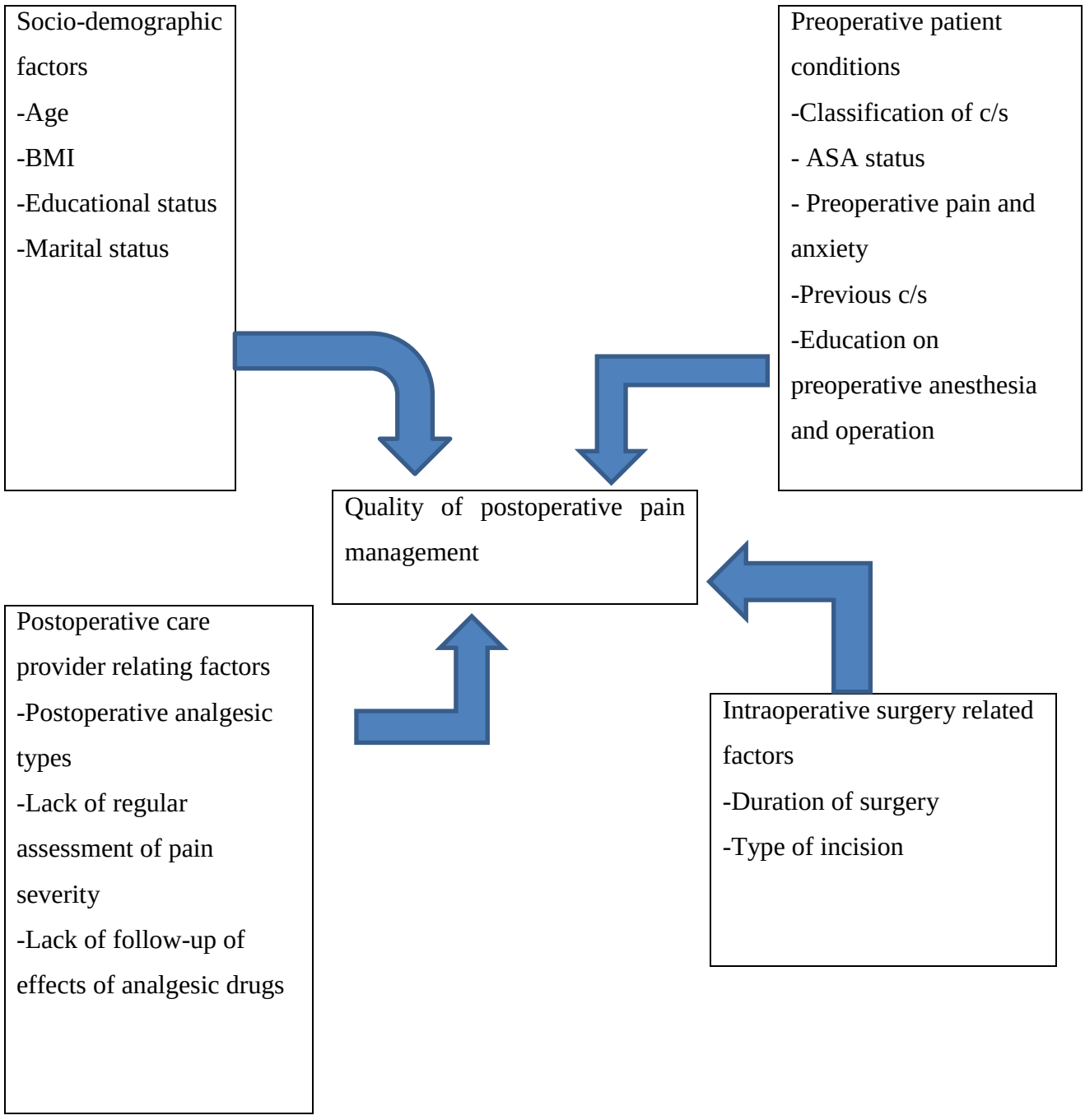

Figure 1: Conceptual frame work based on the relation between dependent and independent variable are developed by the investigators.

CHAPTER THREE: OBJECTIVE

3.1. General objective

- ✓ To assess quality of postoperative pain management among mothers underwent caesarean section under spinal anesthesia in selected hospitals in sidama region Ethiopia, from February to May 2024 G.C

3.2. Specific objectives

- ✓ To assess quality of postoperative pain management among mothers who underwent caesarean section under spinal anesthesia
- ✓ To determine the predicting factors for quality of postoperative pain management among mothers underwent caesarean section under spinal anesthesia at selected hospital
- ✓ To assess the severity of postoperative pain among mothers underwent caesarean section under spinal anesthesia with in 1st, 6th, 12 and 24th postoperative hours at rest and movements at selected hospitals

CHAPTER FOUR: METHODOLOGY

4.1. Study area and period

The study was conducted in one comprehensive specialized hospital and two general hospitals, which are Hawassa University Comprehensive specialized hospital (HUCSH), Yirgalem general hospital and Leku general hospital. Hawassa is a city in Ethiopia's Sidama region, approximately 275 km away from Addis Ababa, the country's capital. The city has thirteen hospitals, five of which are public (HUCSH, Adare general hospital, Motite furra primary hospital, Hawela-tula general hospital, and Alamura primary hospital) and eight of which are private hospitals (Yanet, Alatyon, Abem, Naol, Kibru, Bete-Abriham, Panesia and Seyfana). HUCSH is one of the federal ministries of health's tertiary referral hospitals, as well as a teaching hospital for Hawassa University's College of Medicine and Health Sciences and gave the service more than 18 million populations. Yirgalem General Hospital located in Sidama Regional State in yirgalem town, which is about 315 km from Addis Ababa, the capital city of Ethiopia. Currently the town has only hospital, namely yirgalem general hospital. The hospital serving more than 4.3 million populations in the catchment area and nearby zones of the Oromia region and Gedeo zone population, Leku general hospital located in Leku town, Sidama region and serving more than

1.2 million populations. This town is located at 302 km far from capital city of the country (Addis Ababa). Currently, the town has only one hospital, namely Leku general hospital.

4.2. Study design

A prospective cohort study was conducted from February 2024 to May 2024 at multicenter

4.3. Populations

4.3.1. Source population

All mothers who underwent elective and emergency cesarean section under spinal anesthesia at study area

4.3.2. Study population

All mothers who underwent elective and emergency cesarean section under spinal anesthesia that fulfilled inclusion criteria at study area

4.4. Eligibility criteria

4.4.1. Inclusion criteria

- ✓ All patients age >18 underwent c/s under spinal anesthesia
- ✓ Voluntary and given informed consent to involve in the study
- ✓ ASA II and III mothers underwent elective and emergency c/s under spinal anesthesia

4.4.2. Exclusion criteria

- ✓ Patients with cognitive and mental disabilities
- ✓ Mothers with hearing, or speech impairment
- ✓ Failed spinal anesthesia (partial or complete) and given general anesthesia
- ✓ Direct transfer to an intensive care unit
- ✓ Chronic use of opioids

4.5. Sample size determination and sampling techniques

4.5.1. Sample size determination

In the study areas or at national level, there is no documented information on the prevalence of the level of adequate postoperative pain management. By using finite population correlation formula, the sample size was estimated by assuming a 50% proportional level of adequate postoperative pain management among mothers underwent c/s under spinal Anaesthesia and a

5% margin of error at 95% confidence interval using the following formula's n= $(Z\ a/2)^2 \times p \times q$ / $d^2 = (1.96)^2 \times (0.5)\ (0.5) / (0.05)^2 = 384$

Where: n= sample size.

Z= desired 95% confidence, Z=1.96.

p = proportion of level of adequate postoperative pain management (0.5), *q* =1-*p = 1-0.5=0.5*

d = is the degree of precision (d=5%)

- Situational analysis of the logbook has been estimated 740 (N), elective and emergency cesarean section under spinal anesthesia was done in the previous three months at selected hospitals (HUCSH=339, Yirgalem general hospital=205, and Leku general hospital=196.)

  N = population in last three months in selected hospitals = 740

- By using correction formula for the finite population

  nf = n/1+n/N…..where n is the minimum sample size 384 and N is the total number of Patients operated by c/s under spinal anesthesia per three months at selected hospitals740

  nf = n/(1+n/N)

  So, nf = 384/ (1+384/740) = 322/1.52 = 252

  5% for loss of follow up added = 0.05×252= 12.6

  Therefore, actual total sample size (n final + 5% non-response rate) is 252+12.6 = 264

  nf = final sample size = 264

4.5.2. Sampling technique

The study areas were selected from all sidama region governmental hospitals by chance. We had chosen three governmental general hospitals from seven governmental general hospitals. The sample size was allocated proportionally based on their total population proportion who served at selected hospitals. Based on the hospital HMIS (Hospital Management Information System) report, HUCSH gave service for around 18 million populations, Yirgalem general hospital gave service around 4.3 million population and Leku general hospital gave service for around 1.2 million populations. Total the three hospitals give the service for 23.5 million populations.

Finally sample size allocation:-

HUCSH = 18/23.5x100 = 0.77%, 0.77% of 264 = 203

Yirgalem hospital = 4.3/23.5x100 = 0.18%, 0.18% of 264 = 48

Leku hospital = 1.2/23.5x100 = 0.05, 0.05% of 264 = 13

During the study period, consecutive sampling technique was used till the required sample size is reached.

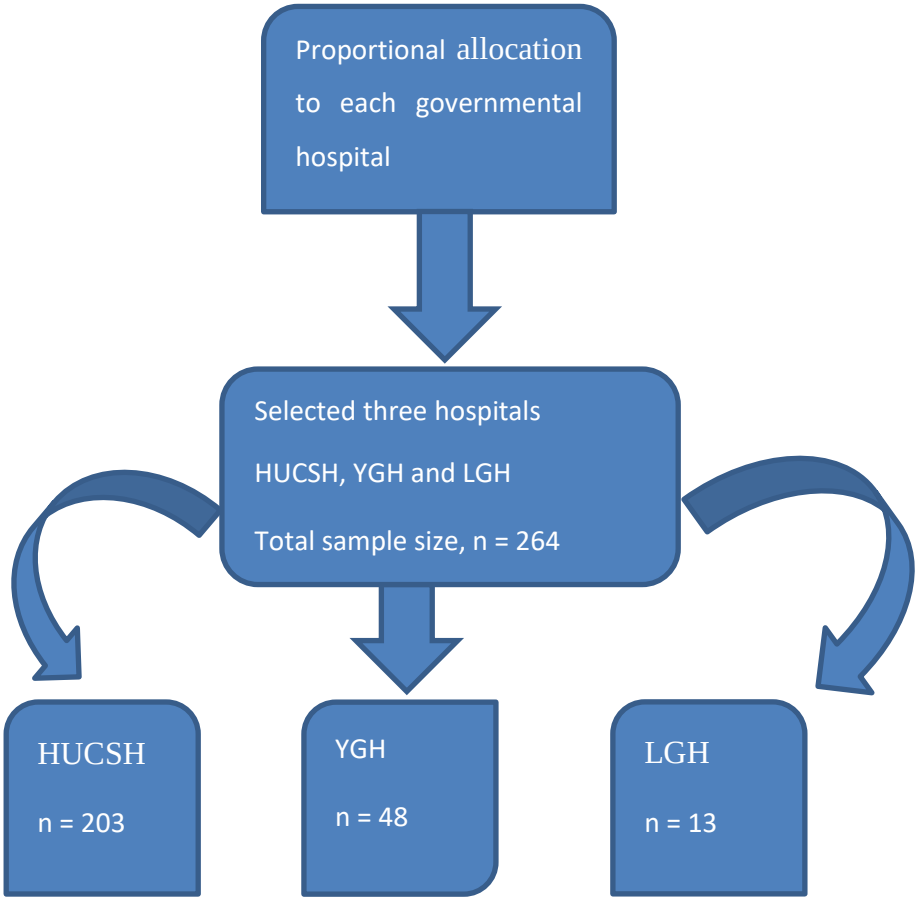

Figure 2 sample size allocation to three selected hospitals

4.5.3. Data collection instruments

The study data were collected using the Patient Information Form and Strategic and Clinical Quality Indicators Postoperative Pain (SCQIPP) in POPM. SCQIPP the questionnaire was developed by Idvall and Ehrenberg to measure the quality of POPM(46). The scale consisted of 14 items. The SCQIPP consists of three subscales: pain management, nursing intervention, and

environment. The items in the SCQIPP were rated on a 5-point Likert type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Although a mean score lower than 4 for an item indicated that the quality of postoperative pain management was not good and a mean score greater than 4 indicated that the quality of postoperative pain management was good. In addition to the aforementioned 14 items, the questionnaire included another questions about patient socio-demographic and preoperative characteristics, intraoperative anesthesia and surgery related questions, and questions about pain severity. To assess preoperative anxiety, we used Amsterdam Preoperative Anxiety and Information Scale (APAIS), which was developed in 1996 by Dutch group of Moermann(15). This questionnaire consists of six items and is, therefore, an economical instrument. The items are rated on a five point Likert scale with the end poles (1) "no" and (5) "severe".

4.6. Study variable

4.6.1. Independent variables

Maternal socio-demographical condition

- ✓ Age
- ✓ BMI
- ✓ Educational status
- ✓ Marital status
- ✓ ASA status of the patient

Preoperative obstetric characteristic and condition

- ✓ Preoperative anxiety and pain
- ✓ Parity
- ✓ Previous cesarean section
- ✓ Educational level
- ✓ Education on preoperative anesthesia and operation

Intraoperative anesthesia and surgery-related condition

- ✓ Duration of surgery
- ✓ Intraoperative analgesic use
- ✓ Use of spinal adjuvant and nerve block
- ✓ Incision type
- ✓ Type of surgery

- ✓ Dose of local anesthetic

4.6.2. Dependent variables

Quality of postoperative pain management

4.7. Data collection procedure and tool

Data collectors were trained before data collection and supervised by a principal investigator every week until the end of data collection period. Four trained BSc Anesthetists were involved for data collection at study area of Leku and Yirgalem general hospital (two for each hospital) and two trained BSc students of HUCSH were involved for data collection process at study area of HUCSH. The data were collected via chart review and interview based on the questionnaire by the assigned data collectors, On preoperative visit, data collectors discussed the study purpose, risks, benefits, how to score pain using NRS, and confidentiality with mothers who met the inclusion criteria and given informed consent.

After taken the informed consent, the data collectors reviewed patients' medical records for all independent variables except educational level, marital status, anxiety, and BMI. Finally, data collectors used the numerical rating scale (NRS, 0-10) to assess the patient's pain severity at 1^{st}hr, 6, 12 and 24 hours postoperatively. Each data collection quality, clarity and completeness were be closely checked by the supervisor.

4.8. Data processing and analysis

The completed data were entered and analyzed on SPSS version 20. Socio-demographic data and pain severity were summarized using descriptive statistics. The finding was reported by using frequency, percentages, standard deviations, ultimately table and graphs. Bivariate and multivariable logistic regression analyses were done to determine presence of associations between dependent and independent variables. Variables with a p-value less than 0.25 in the bivariate logistic regression analysis were considered for multivariable analysis. After checking for multicollinearity, multivariable analysis were performed to adjust for possible confounders and to come up with significant predictors. 95% confidence interval, a p-value was computed to determine the strength of association between the dependent and independent variable. The result p-value of less than 0.05 is considered statistically significant. Both crude and adjusted odds ratio with 95% confidence interval were reported.

4.9. Data quality assurance

To ensure the quality of data, questionnaires were pretested on 5% of the calculated sample size at Adare general hospital out of the study area and Cronbach alpha was 0.80 (80%). Training on the objective and relevance of the study and briefly orientation on the assessment tools were provided to data collectors. During data collection, all data were collected and properly fill in the prepared format. The supervisor was control and checks the completeness of data daily after collection.

4.10. Operational definitions

- ✓ NRS ≥ 4 is moderate to severe pain (NRS of 4-10 score) considered as pain and NRS of ≤3 well-controlled pain or no pain.
- ✓ Complete failed spinal anesthesia: no sensory block that requires repeating of spinal anesthesia or conversion of general anesthesia to precede surgery.
- ✓ Numerical pain score: is the method of pain assessment that is easy and less complicated way to understand
- ✓ At movement: when patients move supported by other person or by themselves at the time of pain assessing.
- ✓ ASA status (adopted from Morgan and Mikhail 5th edition)
- ✓ ASAII- Patient with mild systemic disease (no functional limitations)
- ✓ ASAIII- Patient with severe systemic disease (some functional limitations)
- ✓ Post-operative pain –pain after patient undergoing operation
- ✓ Analgesia–is the methods of reliving pain pharmacologically or non-pharmacologically
- ✓ Quality – refers to how good something is compared to other similar things
- ✓ Quality of pain management – performing comprehensive pain assessment that involves screening for the presence of pain, responses to its management, and developing an efficient plan of care.
- ✓ Good quality of postop pain management - mean score greater or equal to 4 for an item of SCQIPP.
- ✓ Not good quality of postop pain management – mean score lower than 4 for an item of SCQIPP.

4.11. Ethical consideration

Ethical clearance was sought from the institutional review board (IRB) of Hawassa University to conduct the research (IRB/070/16). The purposes and the importance of the study would be explained and verbal as well as written informed consent obtained from each participant. Confidentiality was maintained at all levels of the study by avoiding identifiers and using codes to identify patients. The participant's involvement in the study would be on a voluntary basis, participants who were not willing to participate in the study and those who wish to quit their participation at any stage would be informed and they were allowed to do so without any restrictions.

4.12. Dissemination plan

The result of this research will be presented and submitted after defense to Hawassa University College of Medicine and Health Science department of Anesthesia and Anesthesiology. Finally the result also will send to journals for publication.

CHAPTER FIVE: RESULTS

5.1. Socio-demographic characteristic

In this study, 264 mothers were included for analysis. The mean age was 27.23 ± 4.87. Of the participant, 262(99.2%) were married and 2(0.8%) were single. A total of 49(18.6%) mothers were the educational status of illiterates, 66(25%) were secondary high school, 56(21.2%) were college diploma holder, 50(18.9%) were elementary school and the minority of them 43(16.3%) were degree and above holder.

Table1 socio-demographic characteristics of mothers underwent cesarean section under spinal anesthesia at selected hospitals of sidama region, Ethiopia in 2024 (n=264)

Variables	Category	Frequency	Percentage (%)
Age	18-30 >30	205 59	77.7 22.3
BMI	18.5-24.9 25-34.9	60 204	22.7 77.3

Marital status	Single	2	0.8
	Married	262	99.2
Educational status	Illiterate	49	18.6
	Elementary school	66	25
	High school	56	21.2
	College diploma	50	18.9
	Degree and above	43	16.3
Ethnicity	Sidama	160	60.6
	Oromo	41	15.5
	Gurage	38	14.4
	Wolaita	14	5.3
	Amhara	11	4.2

5.2. Obstetric characteristics and preoperative factors

Of the total participants, 159 (60.2%) and 105 (39.8%) were multiparous and nulliparous, respectively. 96 (36.4%) mothers were delivered on an elective basis and 160(63.6%) were delivered on an emergency basis. A total of 216 (9081.8.4%) mothers were ASA class II. Majority of participants 85(32.2%) had moderate anxiety, and 27(10.2%) and 3(1.1%) mothers had mild and moderate preoperative pain of other origin (non-labor) respectively.

Table2: Obstetrics and preoperative factors of mothers who underwent cesarean section under spinal anesthesia in selected hospitals of sidama region, Ethiopia in 2024 (n=264)

Variables	Category	Frequency	Percentage
Was the mother on labor	No	92	65.2
	Yes	172	34.8
Parity	Null parous	105	39.8
	Multi parous	159	60.2

Classification of c/s	Elective Emergency	96 168	36.4 63.6
ASA physical status	II III	216 48	81.8 18.2
Preoperative anxiety	No Mild Moderate Severe	61 71 85 47	23.1 26.9 32.2 17.8
Preoperative pain of other origin(non-labor)	No Mild Moderate	234 27 3	88.6 10.2 1.1
Previous c/s	No Yes	169 95	64 36
Number of previous c/s	I II III	35 41 11	13.3 15.5 4.2
Preoperative analgesia	No Yes	210 54	79.5 20.5
Education/orientation on preoperative about anesthesia and operation	No Yes	178 86	67.4 32.6

5.3. Intraoperative anesthesia and surgery related characteristic

Most of the patients 253(95.6%) during spinal block were at sitting positions. The duration of a caesarean section that took less than 45 min was 204 (77.3%).

Table3: Intraoperative anesthesia and surgery related factors of mothers underwent cesarean section under spinal anesthesia at selected hospitals of sidama region, Ethiopia in 2024 (n=264)

Variables	Category	Frequency	Percentage (%)

Positions of the patients during spinal block	Sitting Lying on the side	253 11	95.8 4.2
Was the punctured site infiltrated with lidocaine	No Yes	202 62	76.5 23.5
Dose of bupivacaine	15mg 12.5mg 10mg	22 234 8	8.3 88.6 3
Adjuvant added	No Yes	248 16	93.9 6.1
Types of adjuvant added	No adjuvant added Morphine	248 16	93.9 6.1
Supplemental parental analgesia given	No Yes	161 103	61 39
Types of parental analgesia	Tramadol Diclofenac Pethidine	53 1 49	20.1 0.4 18.6
Types of incisions	Classical/midline Pfannestiel/transverse	47 217	17.8 82.2
Intraoperative hypotension	No Yes	104 160	39.4 60.6
Duration of surgery in minute	<46 >45	204 60	77.3 22.7
Nerve block done at the end of surgery	No Yes	240 24	90.9 9.1

5.4. Frequency and percentage of pain at 1, 6, 12 and 24 postoperative hours during rest and movement after cesarean section

At 6 hours postoperative period, numeric pain scoring scale indicated that 64(24.2%), 98(37.1%), 96(36.4%), 6(2.3%) of patients had no, mild, moderate and severe pain at rest respectively. This result was quite different when the patient move at the same time, which was

24(9.1%), 43(16.3%), 164(62.1%) and 33(12.5%) of the patient filled no, mild, moderate and severe pain.

At 12 hours of cesarean section 25(9.5%), 187(70.8%), 44(16.7%) and 8(3%) patient had no, mild, moderate and severe pain consecutively at rest, whereas 8(3%), 70(26.5%), 173(65.5%) and 13(4.9%) experienced no, moderate and severe pain on movement at the same time (12 hours).

Table4: distribution of pain frequency and percentage at 1, 6, 12 and 24 hours of c/s at rest among 264 mothers underwent c/s under spinal anesthesia at selected hospitals of sidama region, Ethiopia in 2024 E.C

Variables	Category	Frequency	Percentage (%)
NPS at 1st hr at rest	No pain	258	97.7
	Mild pain	6	2.3
NPS at 6th hr at rest	No pain	64	24.2
	Mild pain	98	37.1
	Moderate pain	96	36.4
	Severe pain	6	2.3
NPS at 12nd hr at rest	No pain	25	9.5
	Mild pain	187	70.8
	Moderate pain	44	16.7
	Severe pain	8	3
NPS at 24th hr at rest	No pain	104	39.4
	Mild pain	160	60.6

The highest number of the participants experienced moderate to severe pain were at 6 hours at movement 74.62% (197/264) and 12 hours at movement 70.45%(186/264) respectively. The participants experienced no pain were at 1st hour at rest and movement 100% (264/264).

Table5: distribution of frequency and percentage of pain at 1, 6, 12 and 24 hours during movement after c/s under spinal anesthesia among 264 mothers at selected hospitals of sidama region, Ethiopia in 2024 E.C

Variables	Category	Frequency	Percentage (%)
NPS at 1st hr at movement	No pain	187	70.8
	Mild pain	77	29.2
NPS at 6th hr at movement	No pain	24	9.1
	Mild pain	43	16.3
	Moderate pain	164	62.1
	Severe pain	33	12.5
NPS at 12nd hr at movement	No pain	8	3
	Mild pain	70	26.5
	Moderate pain	173	65.5
	Severe pain	13	4.9
NPS at 24th hr at movement	No pain	20	39.4
	Mild pain	199	60.6
	Moderate pain	43	16.3
	Severe pain	2	8

5.5. Patients' Mean Score (SD) for the Subscales and Items for SCQIPP

Based on the level of postoperative care, 12 questions were assessed as “not good” and 2 questions were assessed as “good quality of postoperative pain management.” According to subscales, the level of postoperative care, nursing interventions, and pain management subscales of the SCQIPP were not good, but environment subscales of the SCQIPP were good.

Table6: patients' Mean Score (SD) for the Subscales and Items in the Strategic and Clinical Quality Indicators in Postoperative Pain Management Questionnaire (n = 264).

Variables	M(SD)	Median(minimum-maximum	Quality of postop pain management

Subscale1: Pain management	14.34(0.56)	12(6 – 20)	
1. Before my operation I was told about the type of pain treatment I would be offered after surgery.	3.08(1.09)	3(1 – 5)	Not good
2. After my operation I talked with nurse about how I wanted my pain to be treated.	2.86(0.94)	3(1 – 4)	Not good
3. I received support or help in finding a comfortable position in bed to help avoid pain.	2.78(1.03)	2(1 – 5)	Not good
4. Even when I did not always ask for it, I was given pain medication.	2.71(0.98)	2(1 – 5)	Not good
5. To determine my level of pain, a member of the staff asked me to pick a number between 0 and 10 (or make a mark on a straight line) at least once every morning, afternoon, and evening.	2.91(1.06)	2(2 – 5)	Not good
Subscale2: Nursing intervention	20.65(0.422)	24(14 – 35)	
6. The staff asked me about the pain I had when I breathed deeply, sat up, or moved around.	3.29(0.77)	3(2 – 5)	Not good
7. When nurses come on duty, they know "everything" about how much pain I have had and the pain treatment I have received.	3.21(0.78)	3(2 -5)	Not good
8. The nurses and doctors have cooperated in treating my pain.	3.36(0.70)	3(2 – 5)	Not good

9. The nurses helped me with pain treatment until I was satisfied with the effects of pain reliever.	3.71(0.71)	4(2 – 5)	Not good
10. The nurses are knowledgeable about how to relieve my pain.	3.30(0.66)	3(2 – 5)	Not good
11. The nurses believe me when I tell them about my pain.	3.78(0.57)	4(2 – 5)	Not good
12. There have been enough nurses on duty for someone to respond quickly to my request for pain relief.	3.66(0.79)	4(2 – 5)	Not good
Subscale3: Environment	8.2(0.48)	8(4 – 10)	
13. I was given the opportunity for peace and quiet so I could sleep at night.	4.14(0.66)	4(2 – 5)	Good
14. I have a pleasant room	4.06(0.63)	4(2 – 5)	Good
Total scale	53.19(1.46)		

Note: M = Mean, SD = Standard deviation

Based on the levels: <4 = Not good quality of postoperative pain management, and ≥4 = Good quality of postoperative pain management

5.6. Quality of postoperative pain management

In this study, overall the good quality of postoperative pain management was only 4.17% and 95.83% of postoperative pain management was not good.

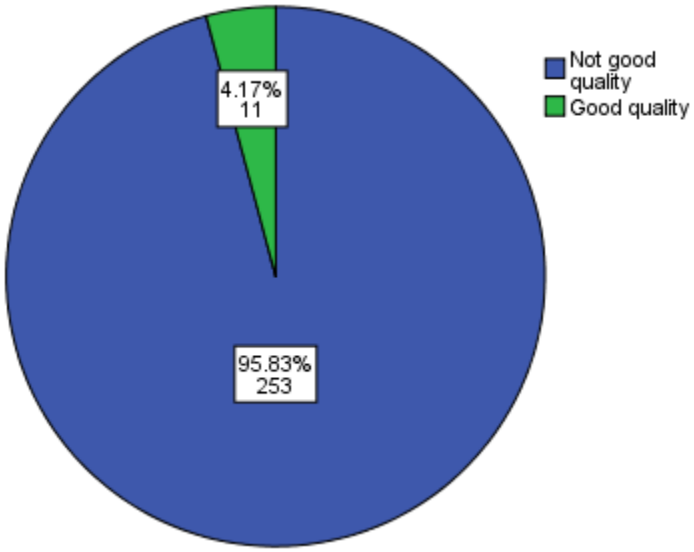

Figure 3: Pie chart showing the quality of postoperative pain management

5.7. Factors associated with quality of postoperative pain management

5.7.1. Result of bivariate analysis

Binary logistic regression analysis was conducted to see the association between independent variables and quality of post-operative pain management. P-value <0.25 bi-variable was transferred to multivariable analyses. Using bi-variable logistic regression analysis; preoperative analgesia given, education/orientation on preoperative about anesthesia and surgery, preoperative anxiety, previous cesarean section, adjuvant added, and nerve block done at the end of surgery were p-value<0.25 and transferred to multivariate analysis.

Table 7: Factors associated with quality of postoperative pain management after cesarean section under spinal anesthesia at selected hospitals of sidama region, Ethiopia 2024 (n=264)

Variables	Category	Quality of postop pain management		COR(95%CI)	P-value
		Good quality	Not good quality		
Education/Orientation	No	2	176	1	

on preoperative about anesthesia and operation	Yes	9	77	10.286(2.171-48.723)	0.003
Adjuvant added	No	7	241	1	
	Yes	4	12	11.476(2.950-44.641)	<0.001**
Nerve block done at the end of surgery	No	7	233	1	0.050
	Yes	4	20	6.657(1.795-24.688)	
Preoperative anxiety	No	8	53	1	
	Mild	0	71	0(0-0)	0.997
	Moderate	2	83	0.159(0.033-0.781)	0.023*
	Severe	1	46	0.144(0.017-1.195)	0.073
Previous c/s	No	2	167	1	
	Yes	9	86	8.738(1.847-41.340)	0.06
Preoperative analgesia given	No	5	205	1	
	Yes	6	48	5.125(1.501-17.494)	0.009**

5.7.2. Result of multivariable analysis

In the final model (multivariate logistic regression analysis), after excluding variables which doesn't fit for the model using P-value >0.25, multivariate analysis was performed for those variables; Education/Orientation on preoperative about anesthesia and operation, Adjuvant added, and nerve block done at the end of surgery were associated with quality of postoperative pain management.

Patients educated/oriented on preoperative about anesthesia and surgery were >6 times (AOR=6.856; 95%CI: ((2.171-48.723) more likely to increase quality of postoperative pain management than not educated/oriented.

This study indicated that giving bupivacaine with adjuvant increases quality of postoperative pain management by nearly six times (AOR=5.909; 95%CI: (1.314-26.570) more likely than giving bupivacaine without adjuvant.

This study reveals that nerve block done at the end of surgery increased quality of postoperative pain management by >4 times (AOR= 4.643; 95%CI: (1.075-20.050) than not done nerve block at the end of surgery.

Table8: Multivariable logistic regression showing predictors for quality of postoperative pain management among mothers underwent caesarean section under spinal anesthesia at selected hospitals of sidama region, Ethiopia in 2024 (n = 264).

Variables	Category	Quality of postop pain management		COR(95%CI)	AOR(95%CI)	P-value
		Good quality	Not good quality			
Education/Orientation on preoperative about anesthesia and operation	No	2	176	1	1	0.021*
	Yes	9	77	10.286(2.171-48.723)	6.856(1.344-34.980)	
Adjuvant added	No	7	241	1	1	0.021*
	Yes	4	12	11.476(2.950-44.641)	5.909(1.314-26.570)	
Nerve block done at the end of surgery	No	7	233	1	1	0.040*
	Yes	4	20	6.657(1.795-24.688)	4.643(1.075-20.050)	

COR= crud odd ratio, **AOR**= Adjusted odd ratios, **1**= Reference,
CI=confidence interval, statistically significant ** P < 0.05

The overall patients who were satisfied with pain management service were 120(45.5%). Of total 98(37.11%) were reported as dissatisfied about postoperative pain treatment and a few participants 2(0.8%) were reported as very dissatisfied about pain treatment since spinal block. From total participants 79(29.9%) were reported there general opinion about pain treatment as poor and 75(28.4%) expressed their general opinion as good pain treatments. Of total 162(61.4%) and 102(38.6%) explained their feeling during spinal needle insertion like they felt only some things piercing their body and nothing respectively, and majority of participants 145(54.9%) have no pain during spinal needle insertion. From total participants 82(31.1%) postoperative pain treatment were poor and needs improvement and small participants 46(17.4%) were reported that they have no idea to improvements.

Table9: General open-ended questions (used for qualitative analysis)

Variables	Category	Frequency	Percentage (%)
How satisfied are you about quality of pain treatment so far (since spinal block)	Very dissatisfied	2	0.8
	Dissatisfied	98	37.1
	Neutral	16	6.1
	Satisfied	120	45.5
	Very satisfied	28	10.6
Tell us your general opinion about our pain treatment	Poor pain treatment	79	29.9
	Neutral	61	23.1
	Satisfactory	38	14.4
	Good pain treatment	75	28.4
	Very good pain treatment	11	4.2
How do you feel about the pain during of spinal needle insertion?	Nothing	102	38.6
	Some things piercing my body	162	61.4
How do you rate your pain experience during spinal needle insertion?	No pain	145	54.9
	Mild pain	80	30.3
	Moderate pain	39	14.8
What aspects of pain treatment do you want us to	Postoperative pain treatment	82	31.1
	Labor pain treatment	58	22

improve next time?	Drug selection	78	29.5
	No idea to improvement	46	17.4

CHAPTER SIX: DISCUSSION

High-quality pain relief is important after cesarean section to promote early recovery and optimize mothers' ability to care for their newborns. Optimal quality of postoperative pain management remains significantly low level despite the availability of multiple preoperative, intraoperative and postoperative pain management interventions.

In our study, the quality of postoperative pain management, only 11(4.17%) were at the level of good quality of postoperative pain management, but 253(95.83%) were at the level of poor postoperative pain management.

The risk factors analyzed from multivariate logistic regression Education/Orientation on preoperative about anesthesia and operation, Adjuvant added, and nerve block done at the end of surgery were statistically significant with quality of postoperative pain management.

The quality of postoperative pain management of this study is in line with research done by Gülten Sucu Dağ, et al in Turkey(47). They reported that in subscale of "pain management" quality of postoperative pain management was poor but in terms of nursing intervention and environment which was good quality of postoperative pain management. In our study, both "pain management and nursing intervention" subscale were at poor level and environment subscale was at good quality of care. The variation might be as a result of study populations. In their study they included different surgical specialty together but in our study we included only c/s.

It is important in the quality of pain management and patient comfort for nurses to manage pain by using advanced care procedures. Our finding show that, Quality of nursing care in the subscales: nursing interventions, and nurses' communication, were evaluated as not good. This result is inconsistent with study done by Jozefa Czarnecka et al(48). The possible reason for this difference could be due to different POPM procedures, resources and study area.

In this study patients who were Educated/Oriented on preoperative about anesthesia and operation were independent predictors for quality of postoperative pain management with p-value is 0.021. This means, patients educated/oriented on preoperative about anesthesia and surgery were >6 times (AOR=6.856; 95%CI: ((2.171-48.723) more likely to increase quality of postoperative pain management than not educated/oriented. This result is in line with research done in Australia by Khraim, et al(49). These results recommend that educating a patient in pain management increases the quality of care regarding pain management.

We founded that the addition of an adjuvant to bupivacaine in spinal anesthesia were important independent predictors for quality of postoperative pain management with p–value 0.021. This indicated that giving bupivacaine with adjuvant increases quality of postoperative pain management by >5 times (AOR=5.909; 95%CI: (1.314-26.570) more likely than giving bupivacaine without adjuvant. This finding is supported by research done by Natalia de Carvalho Borges et al; the similarity is due to adding of opioid increase the duration of analgesia, decrease the severity of postoperative pain and increase the quality of postoperative pain management(50).

We founded that performed nerve blocks at the end of the procedure were important independent predictors to quality of postoperative pain management with the P value is 0.040. This indicated that nerve block done at the end of surgery increased quality of postoperative pain management by >4 times (AOR= 4.643; 95%CI: (1.075-20.050) than not done nerve block at the end of surgery. This finding is supported by research done by Abdalkarem et al in Arabia (51) and Jogie et al in India(52).

In our study, the highest score of moderate pain were 164 (62.2%) and 173 (65.5%) at 6^{th} and 12 hour postoperative at movement respectively. The severe pain score at 6^{th} and 12 hour at movement were 33 (12.5%) and 13 (4.9%) respectively. Despite high levels of pain intensity postoperatively, 120 (45.5%) and 28 (10.6%) of participants were reported as satisfied and very satisfied respectively by postoperative pain management.

This study shows that patients were highly satisfied with pain management, even when they were in pain. This has been termed the “severe pain-high satisfaction paradox”(53), and seems to be a common finding(54). This contradiction has been taken in many ways, and HCPs’ caring

attitudes towards patients was one possible reason, i.e. HCPs' compassionate care might diminish the patients' pain experience and improve their satisfaction(54). For example, a positive correlation between satisfaction and adverse events was observed previously(55). Moreover, some people believe that the measure of satisfaction is not a reliable indicator of the quality of postoperative pain treatment and should not be used(56).

6.1. Strength:

- Adequate number of participants found within the planed period of time.
- This was the first prospective cohort study using data from three hospitals to evaluate the quality of postoperative pain management in cesarean section.
- The study also attempted to apply advanced methods of statistical analysis, which are recommended by experts in the field and used reliable and valid tools to assess pain and quality of postoperative pain management.

6.2. Limitations:

- We used consecutive sampling method for data collection, so this may cause bias.
- We didn't assess the experience of health profession as a one associated factors for quality of postoperative pain management, because experience of health profession itself might be associated factors for quality of postoperative pain management.

CHAPTER SEVEN: CONCLUSSION AND RECOMMENDATION

7.1. CONCLUSSION

In this study, the number of participants at the level of good quality of postoperative pain management were only 11(4.17%) and 253(95.83%) participants quality of postoperative pain management were at the level of not good. In this study, the general quality of postoperative pain management was poor. Factors like Education/Orientation on preoperative about anesthesia and operation, Adjuvant added, and nerve block done at the end of surgery were predictors for quality of postoperative pain management. The practice of performing nerve block at the end of the procedure and adding adjuvant to a spinal local anesthetic agent were significantly reduced the experience of postoperative pain and increase the quality of postoperative pain management.

7.2. Recommendations

For health care providers

- Give adequate information/orientation about operation and pain management options which decrease anxiety and increase quality of postoperative pain management.
- Performing of nerve block and using adjuvant with bupivacaine should be routine practice.

For institutions

- The institution should be increase access of analgesic agents and important infrastructure for nerve block.
- Provide regular supervision program of the health care provider about postoperative care.

For researchers

We recommend researchers to do further more detailed studies on this topic with a large sample size by including comparator group.

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Annex

Annex I: English version Consent form

Dear participant:

My name is **Thomas Ameno**; I am attending a postgraduate program in the field of Anesthesia at Hawassa comprehensive specialized hospital. I am conducting my thesis on **Assessment of quality of postoperative pain management among mothers undergo caesarean section under spinal anesthesia** at Hawassa university comprehensive specialized hospital, Yirgalem general hospital and Leku general hospital in 2024, Hawassa Ethiopia.

You are selected for this study as you are undergoing cesarean section under spinal anesthesia on the selected operation room. Your involvement in this study is only based on your full willingness and has the right to choose not to take part; in addition to that you have the right to stop at any time after you agree to participate. There is no personal benefit or harm for the

participant by participating in the study but the result will aid researcher and other health professional to improve their way of management of perioperative pain.

The information you provide will be kept confidential by using code number and only the researcher asses the coded data. The data collected will only be used for the purpose of this study and communicated unanimously. Your willingness to participate will play vital role for success of this study.

Would you be willing to participate in the study please?
YES NO

Thanks for taking part in the study!!!!

For further question ask investigator
Tele - **+251932664146**
E-mail – thomyam022@gmail.com

Date of data collection _____

Annex II: Questionnaire

Instruction: For each question, please circle the number of alternative (s) that fit the response and fill the blank space provided or choice from the given alternatives

Data code _____ MRN----------

Part I: Questionnaire on socio demographic characteristic of mothers

1	Age(year)	----------year
2	Height(in meter)	----------m
3	Weight(in kg)	----------kg
4	BMI(kg/m2)	----------kg/m2
5	Marital status	A. Single B. Married C. Divorced/windowed
6	Educational status	A. Illiterate B. Elementary school C. High school D. College diploma E. Degree and above

7	Occupation	A. Housewife B. Self-business C. Health profession D. Teacher E. Other governmental employee F. Private or NGO employee G. Other, specify……
8	Ethnicity	A. Oromo B. Amhara C. Sidama D. Gurage E. Wolaita F. Other, specify……

Part II: Questions on obstetric characteristics and Preoperative factors

9	Gestational age(in week) (Obstetrician estimated)	----------wks
10	Was the mother on labor?	A. No B. Yes
11	If in labor, how did she rate the severity of labor pain	A. No pain B. Mild C. Moderate D. Severe
12	Parity	A. Null parous B. Multi parous
13	Classification of c/s	A. Elective B. Emergency
14	ASA physical status	A. ASAII B. ASAIII
15	Preoperative anxiety	A. No B. Mild C. Moderate D. Severe
16	Preoperative pain of other origin(non-labor)	A. No B. Mild C. Moderate D. Severe
17	Previous c/s	A. No B. Yes (I, II, III, IV, >IV…….)
18	Preoperative analgesia	A. No B. Yes
19	If your answer is yes for question No 18, what types of analgesia	A. Tramadol B. Diclofenac C. Ibuprofen D. Pethidine E. Morphine C. Other specify……
0	Education/orientation on preoperative about Anesthesia and operation	A. No B. Yes

Part III: Intra operative anesthesia and surgery related associated factors

21	Position of the patients during spinal block	A. Sitting B. Lying on the side
22	Was the punctured site infiltrated with lidocaine	A. No B. Yes
23	Ask the patient if the patient was happy or unhappy about infiltration(not puncture)	A. Unhappy B. Happy
24	Dose of bupivacaine	A. 15mg B. 12.5mg C. 10.5mg D. Other, specify…..
25	Adjuvant added	A. No B. Yes
26	If your answer is yes, types of adjuvant added	A. Pethidine B. Fentanyl C. Morphine D. Neostigmine E. Other, specify….
27	Supplemental parental analgesia given	A. No B. Yes
28	Type of parental analgesia given	A. Tramadol B. Diclofenac C. Ibuprofen D. Pethidine E. Morphine F. Other, specify…..
29	Type of incision	A. Classical(midline) B. Pfannestiel
30	Intraoperative hypotension	A. No B. Yes
31	Duration of surgery in minute	----------min
32	Nerve block done at the end of surgery	A. No B. Yes
33	If your answer is yes, types of nerve block done	A. TAP B. Wound infiltration C. Other specify….

Part IV: Severity of pain at 1st hr, 6, 12 and 24 hours of recovery and participant response both at rest & on movement

Sn	Items	Severity of pain by numeric rating scale(NRS)			
		No pain (0)	Mild pain (1-3)	Moderate pain (4-6)	Severe pain 7-10)

1	Numeric pain score at 1st hr at rest				
2	Numeric pain score at 1st hr at movement				
3	Numeric pain score at 6th hr at rest				
4	Numeric pain score at 6th hr at movement				
5	Numeric pain score at 12hr at rest				
6	Numeric pain score at 12 hr at movement				
7	Numeric pain score at 24th hr at rest				
8	Numeric pain score at 24th hr at movement				

Part v: Subscales and Items in the Strategic and Clinical Quality Indicators in Postoperative Pain Management Questionnaire (N = 14).

Below are a few statements about patient pain treatment. Please put right sign (√) from 1 to 5 that best describes their opinion about pain treatment at this ward on the day/days following the operation. (1 = strongly disagree and 5 = strongly agree)

		Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Sn	Items	1	2	3	4	5
	Subscale 1: pain management					
1	Before my operation I was told about the type of pain treatment I would be offered after surgery.					
2	After my operation I talked with a nurse about how I wanted my pain to be treated.					
3	I received support or help in finding a comfortable position in bed to help avoid pain.					

4	Even if I did not always ask for it, I was given pain medication.					
5	To determine my level of pain, a member of the staff asked me to pick a number between 1 and 10 (or make a mark on a straight line) at least once every morning, afternoon, and evening.					
	Subscale 2. Nursing interventions					
6	The staff asked me about the pain I had when I breathed deeply, sat up, or moved around.					
7	When nurses come on duty, they know "everything" about how much pain I have had and the pain treatment I have had received					
8	The nurses and doctors cooperated in treating my pain					
9	The nurses helped me with pain treatment until I was satisfied with the effects of pain reliever.					
10	The nurses are knowledgeable about how to relieve my pain.					
11	The nurses believe me when I tell them about my pain.					
12	There have been enough nurses on duty for someone to respond quickly to my request for pain relief.					
	Subscale 3: Environment					
13	I was given the opportunity for peace and quiet so I could sleep at night.					
14	I have a pleasant room.					

Part VI: General open-ended questions (used for qualitative analysis)

1. How satisfied are you about quality of pain treatment so far (Since spinal block)
   A. Very dissatisfied B. dissatisfied C. neutral D. satisfied E. very satisfied
2. Tell us your general opinion about our pain treatment.

---

3. How do you feel about the pain during of spinal needle insertion?

3.1. How do you rate your pain experience during spinal needle insertion?

A. No pain B. Mild C. Moderate D. Severe

4. What aspects of pain treatment do you want us to improve next time?

Name of data collector……..signature…….

Name of supervisor……...signature…….