

Utilization of labor pain management methods and associated factors among obstetric care givers at public health institutions of East Gojjam Zone, Amhara region, Ethiopia, 2020: a facility based cross – sectional study

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Abstract

Background

Labor Pain is “unpleasant sensory and emotional experience associated with actual or potential tissue damage, affects parturient and fetuses’. Developed countries regularly use obstetric analgesia but in developing countries, including Ethiopia pain is neglected and most women go through painful labor. The study was conducted in public health institutions of East Gojjam Zone; Amhara region, Ethiopia. The aim of this study was to assess utilization of labor pain management methods and associated factors among obstetric care givers in the study setting.

Method

Facility-based cross sectional study design was carried out in public health institutions of East Gojjam Zone from April 15 to May 15, 2020. Semi Structured questionnaires were used and 305 obstetric care givers were participated. Stratified sampling technique was used. Data was entered by Epi- data version 3.1 and exported to SPSS version 20. Descriptive analysis was done and Bivariate and multivariate logistic regression with 95% CI was used to saw the association of dependent and independent variables at $p < 0.05$.

Result

Utilization of labor pain management methods in this study was 48.9%. In Multivariate logistic regression; Professional knowledge [AOR = 2.006, 95% CI = ((1.032–3.898)], availability of drug and equipment [AOR = 2.937, 95% CI= (1.311–6.578)] and allow companionship [AOR = 2.587, 95% CI= (1.322–5.063)] were significantly associated with utilization of labor pain management methods.

Conclusion and recommendation

: This study showed low utilization of labor pain management methods. Adequate knowledge, allow accompany and availability of drug & equipment were factors associated with use of labor pain relief options .so it is important to build knowledge of obstetric care givers, availing drugs and materials and make safe the environment for accompany ship to improving use of labor pain management.

Background

Labor Pain is “an unpleasant sensory and emotional experience, which is a complex, subjective and multidimensional response leads to actual or potential tissue damage (1, 2).Also it causes endorphin release which leads three- to five-fold increment of plasma concentrations of adrenaline and noradrenaline (3). It’s advancement associated with ischemia of uterus due to contraction, dilation of

cervix, stretching of vagina, perineum and pelvic structures (2). Even if it had no pathological process most women stated as labor pain is most severe distressing event and painful experience, due to that most of women are concerned about labor pain and how they can be relieved from pain (4–6).

Because of labor pain is subjective and differs from woman to woman, So it is better to have option according to their favorite and individual conditions (7). Modern obstetrics set internalizing distress of laboring mother and maintaining safe labor with minimum pain as one of the basic principles (8). So awareness of labor pain helps to have stress on labor pain management with consideration of their choice (9). Methods of labor pain relief should be effective, safe, woman-centered and not affect women's mobility or the progress of labor (10, 11).

Pharmacological method like pethidine (Meperidine) and other analgesics are used to effectively control labor pain (12, 13). Additionally, herbal medicine and non-pharmacological methods like emotional support from partners, family members, and professional or non-professional staff, assuming specific positions, moving, prayer for God to reduce their pain, breathing exercises, taking showers are used to control labor pain which gives maternal birth satisfaction and good fetal outcome (13–20). Then both pharmacological and non-pharmacological methods are important to relief labor pain effectively (21).

Provision of pain relief in labor is neglected, without argument of the need, advantages and disadvantages of pain relief options, especially pharmacological options (22). Lack of awareness, misunderstanding regarding acceptability, safety and availability of pain relief options and misconceptions like considering labor pain as normal and its interference is not good for health are considered to be the main reasons why women in many lower and middle income country (LMIC) like Ethiopia, do not receive adequate pain relief (23, 24). But, if labor pain exceeds a certain intensity and duration affects the hopeful mother and her attitudes toward her baby (25, 26)

Fear of severity of labor pain and lack of appropriate labor pain management to laboring mother leads concern about the approaching birth or request a caesarean section and expose them for financial constrain (27). About 36.4% of laboring mother desired the procedure/caesarian section to avoid labor pain (28). Also Women low satisfaction in intra partum care was associated with poor pain relief during labor and vaginal birth (29–32). That influences a woman's choice of place of delivery in Ethiopia (33). Due to that only 48% of births occur in health facility from those received antenatal care (34). In this case utilization of labor pain managements can be the great opportunity to enhance institutional delivery. Developed countries regularly use obstetric analgesia and stressed on continuous labor support, but, in developing countries, including Ethiopia pain is neglected, obstetrics service are poorly developed and most women still go through painful labor regardless of availability of methods (22, 35, 36). Even if it is the serious components in the Ethiopian federal minister of health's (EFMOH) efforts to advance the quality of maternal health services available to the Ethiopian public, its practice is not significantly accepted (37). There are only few published studies in Ethiopia on magnitude of labor pain management methods and associated factors and on study area one study had done only in health centers. So this

study assesses the magnitude of use of labor pain management methods and associated factors in all level of public health institutions of east Gojjam zone, Amhara, Ethiopia .

Methods

Institutional based cross sectional study was conducted in public health institutions of East Gojjam Zone. East Gojjam is one of the administrative Zones in Amhara regional state of Ethiopia. It is bounded by the Oromia region in the south, on west by West Gojjam zone, on north by South Gondar zone, and on the east by South Wollo zone. Debre Markos is the capital city of East Gojjam Zone and located at 265 km from Bahir Dar and 299 km from Addis Ababa the capital city of the country. According to census of 2007, conducted by the central statistical agency of Ethiopia (CSA), the zone has a total population of 2,153,937, among this, 1,066,716 are men and 1,087,221 women; with an area of 14,004.47 square kilometers. East Gojjam zone has 19 woredas .It has one referral hospital, one general hospital, eight primary hospitals, and 102 health center. Currently there are 6 gynecologists, 107 general practitioners, 488 midwives, 22 IESO, 22 anesthetists, 841 nurses and 366 health officers providing maternal and child health (MCH) services in the above mentioned institutions. The study was carried out from April 15-May 15, 2020.

There are 112 health institutions in east Gojjam zone. So those were stratified as referral hospital, general hospital, primary hospital and health center .From each strata 25% of health institution were selected by simple random sampling technique with assumption of there is no variation of health institutions with in each strata. Then because of they were small in number to allocate proportionally, all obstetric care givers who were working at labor ward in the selected public health institutions of East Gojjam Zone and convenient in the data collection period were used as censes. Study variables were Socio demographic factors, Individual factor and institutional factor.

Measurments

Semi-Structured and self-administered questionnaires were utilized after constructing from different literatures The questionnaires consist six portions; which was used to assess socio-demographic characteristics ,knowledge and attitude of obstetric care givers, utilization, preference of labor relief methods and institutional factors affecting the use of labor pain management options (38-40). The questionnaire was designed in English to be understandable by respondents at data collection time. Six BSc midwife teaching staff was collected the data and one MSc teaching staff was supervise the data collection.

Before actual data collection pretest was conducted by 5 % of the sample to shape and clarify any ambiguity of the questioner. In order to have common understanding of the study and the questioner; Training was provided to data collectors and supervisor. There were frequent supervision during data collection and the questionnaire was reviewed and checked for completeness, accuracy and consistency following data collection. Code was give before data entry.

Data analysis

After data collection, data were entered by Epi-data version 3.1 and exported to Statistical Package for Social Science (SPSS) version 20 for further analysis. Descriptive statistics was used to determine frequencies and summary statistics. Primarily, bi-variable logistic regression was carried out to saw the significance association of each of the independent variables with the outcome variables at 95% confidence interval and p-value less than 0.25. Then multivariable logistic regression was carried out for variables with a p-value less than 0.25 in bivariate logistic regression to determine significant relationships between the dependent and independent variables at p-value less than 0.05. Model fitness was check by using Hosmer and Lemeshow's goodness of fit.

Ethical approval was obtained from the Ethical Review committee (ERC) of Debre Markos University, College of Health Sciences. The letter from ERC was submitted to East Gojjam Zone Health Bureau and Letter of permission was submitted to each health institutions. Verbal informed consent from each study participants was obtained and all the responses were kept confidential and anonymous.

Result

Socio demographic characteristics of respondent

Three hundred five participants were responded to questioner with the response rate of 94.4 % .The mean age of the respondents were 28.3 year (SD \pm 4.1) .Majority of the respondent 213 (69.8 %) were between age group of 20-29 .Among the respondent 195 (63.9%) were male sex and 287(94.1%) were orthodox religion follower. Majority of the respondents 150 (49.2 %) were midwives, 182 (59.7%) were BSc holders and 175 (57.4%) of respondents had less than 5 years' experience. **Table 1**

Table 1: Socio demographic characteristics of obstetric care giver who works labor ward in health institution of east Gojjam zone, Amhara, 2020. (n=305)

characteristics	Frequency	Percent (%)
Age group		
20-29 yrs.	213	69.8
30-39 yrs.	84	27.6
≥40 yrs.	8	2.6
Sex		
Male	195	63.9
female	110	36.1
religion		
orthodox	287	94.1
Muslim	7	2.3
protestant	11	3.6
profession		
medical doctor	12	3.9
midwife	150	49.2
nurse	60	19.7
health officer	61	20.0
IESO	8	2.6
anesthetist	14	4.6
Level of education		
gynecologist	4	1.3
Resident doctor	2	.7
General practitioner	8	2.6
MSc	16	5.2
BSc	182	59.7
Diploma	93	30.5
Clinical experience		
≤5 yrs.	175	57.4
6-9 yrs.	93	30.5
≥10 yrs.	37	12.1

Knowledge and Attitude of Respondents

Among the total respondents about 298(97.7%) knew about labor pain management methods. From them 215 (70.5%) knew both pharmacological and non-pharmacological methods, 74(24.8%) only non-pharmacological and 9(3%) were knew only pharmacological methods.

Of the pharmacological labor pain management methods 126 (41.3 %), 106 (34.8%), 95(31.1%) and 24 (7.9%) of respondents knew systemic opoid, regional analgesia, non opoid systemic analgesia and inhalational respectively. And from non-pharmacological methods the most known one is psychotherapy respond by 219 (71.8%) respondents. Next 159 (52.1%), 155(50.8%) , 150 (49.2%) and 127(41.6 %) responds allow the mother to ambulate, massage the back ,relaxation & breathing technique and show the patient how bear down respectively. **(Table 2)**

In this study among the total respondents, 126 (41.3 %) had adequate knowledge from listed knowledge related questions. The mean score of respondents were 4.4 with (SD \pm 2.77).

From the respondent who knew about pharmacological methods 167(54.8 %) expect obstetric analgesia has side effect on labor delivery outcome by causing 118 (38.7%) fetal distress,111 (36.4%) delay progress of labor ,62 (20.3%) increase instrumental delivery and 7 (2.3%) other like bleeding .

Regarding respondents attitude towards labor pain management methods 163 (53.4%) respondents had favorable attitude. The mean score of respondent were 22.6 with (SD \pm 4.1). More than half of the respondent 181(59.3%) agree that labor pain management methods help laboring mother to cope labor pain. And also 166(54.4%) agree to professionals has responsibility and obligation of managing labor pain and 139(44.9%) agree that analgesia is necessary for managing labor pain.

Table 2 : Knowledge's of non –pharmacological labor pain management methods among obstetric care givers in public health institutions of East Gojjam Zone, Amhara, 2020. (305)

Method		Frequency	Percent (%)
psychotherapy	no	86	28.2
	yes	219	71.8
allow the mother to ambulate	no	146	47.9
	yes	159	52.1
massage the back	no	150	49.2
	yes	155	50.8
relaxation and breathing technique	no	155	50.8
	yes	150	49.2
show the patient how to bear down	no	178	58.4
	yes	127	41.6
music therapy	no	243	79.7
	yes	62	20.3
allow companion of her choice	no	254	83.3
	yes	51	16.7
diversional therapy	no	283	92.8
	yes	22	7.2
Transcutaneous electrical nerve stimulation	No	289	94.8
	Yes	16	5.2
acupuncture	no	294	96.4
	yes	11	3.6
subcutaneous water injection	no	296	97.0
	yes	9	3.0
hypnosis	no	301	98.7
	yes	4	1.3

Personal Preference and Pain Expectation of Respondent

From the respondents 161 (54%) prefer non pharmacologic method, 98 (32.9%) both pharmacologic& non pharmacologic and 39(13.1%) pharmacologic method to manage laboring mothers. Majority of respondents 211 (69.2 %) expect labor pain as severe pain. **(Figure 1)**

Institutional factor

From respondents who knew pharmacological methods 119 (71.3%), 100(59.9%) and 37 (22.2%) answered as NSAID, petidine and epidural analgesia respectively were available in their health institution. And 163 (53.4%) of the respondents reported as their health institution allow companion for choice of laboring mother. From the total respondents only 33(10.8 %) had got training regarding managing of labor pain.

Utilization of labor pain management methods

The overall utilization of labor pain management methods in this study was 48.9% with 95% confidence interval [44.3-54.1] and the mean score of utilization were 2.7 (SD±2.4). Among this 41.3% contribute to non-pharmacologic and 4.6% to pharmacologic methods. The most widely used non pharmacological method was 146(47.9%) psychotherapy followed by 126(41.3 %) allow the mother to ambulate and 110 (36.1%) massage the back. **(Figure 3)** Also from pharmacological labor pain management methods 62 (20.3 %) of respondents used paracetamol, 60 (19.7%) petidine, and 54(17.7%) NSAID. Majority obstetric care givers (67.6 %) use labor pain management methods in sometimes. **Figure 2**

Associated factor of utilization of labor pain management methods

Based on bi-variable analysis obstetric care giver experience, knowledge, availability of analgesia, attitude, profession, age, allow companion for laboring mother and training were associated with utilization of labor pain management methods at p - value less than 0.25 and becomes candidate for multi variable logistic regression. In multi variable analysis Knowledge, allow companion and availability of analgesia were significantly associated with utilization of labor pain management methods at p - value less than 0.05.

Obstetric care givers who had adequate knowledge were 2.01 times more likely to utilize labor pain management methods than those who had inadequate knowledge, [AOR=2.006, 95 % CI = (1.032-3.898)] .Obstetric care givers, in the institution which allow companion for choice of laboring mothers were 2.59 times more likely to utilize labor pain management methods than those in the institution not allow companion, [AOR=2.587, 95% CI= (1.322-5.063)]. Also obstetric care givers, in the institutions which had availability of analgesia drug were 2.94 times more likely to utilize labor pain management methods than those in the institution had no availability of analgesia drugs.[AOR = 2.937, 95% CI= (1.311-6.578)] or

when drugs were not unavailability in the institutions, obstetric care givers were 68% times less likely to utilize labor pain methods than when drugs were available [AOR =0.317,95 % CI= (0.167-0.601). **Table 3**

Table 3 .Bivariate and multivariate logistic analysis of associated factors of utilization of labor pain management methods among obstetric care giver in health institutions of East Gojjam Zone, Amhara 2020.

Variables	Utilization of labor pain management methods		COR(95% CI)	AOR(95% CI)	P value
	Yes	No			
Age group					
20-29	163	50	1.577(.920-2.704)	1.263(.507-3.147)	.616
≥30	62	30	1.00	1.00	
Experience					
≤5	130	45	1.970(.941-4.123)	1.494(.452-4.938)	0.510
6-9	73	20	2.489(1.094-5.661)	2.985(.942-9.462)	.063
>10	22	15	1.00	1.00	
Profession					
Midwife	117	33	1.543(.921-2.586)	.970(.482-1.951)	.931
Other	108	47	1.00	1.00	
Knowledge					
Adequate	102	24	1.935(1.121-3.339)	2.006 (1.032-3.898)	0.04
Inadequate	123	56	1.00	1.00	
Companion					
Yes	135	28	2.786(1.638-4.739)	2.587 (1.322-5.063)	0.006
No	90	52	1.00	1.00	
Availability					
No	18	18	1.00	1.00	

Yes	132	34	3.882(1.826-8.254)	2.937 (1.311-6.578)	0.009
I don't know	14	8	1.750(.590-5.189)	2.276 (.710-7.296)	.167
Training					
No	197	75	1.00	1.00	.671
Yes	28	5	2.132(.794-5.726)	1.287 (.403-4.112)	
Attitude					
Favorable attitude	127	36	1.584(.948-2.646)	1.456 (.755-2.808)	.262
unfavorable attitude	98	44	1.00	1.00	

Others: medical doctor, nurse, IESO, anesthetist and health officer

Discussion

The overall utilization of labor pain management methods among obstetric care givers were 48.9% and 41.3% contribute to non-pharmacological methods.

The result in this study is greater than study conducted in Kembata Tembaro Zone, Southern Ethiopia 37.9% (39), Amhara region referral hospitals 40.1% (40) and Tigray region general hospitals 43.3% (38) on labor pain management methods. This difference may be due to change in study area; this study incorporates all level of education of obstetric care givers & health institutions and variation of sample size. The result of this study is less than study done in Addis Ababa which was 54.2% (41). This may be due to socioeconomic difference, advancement of the institution to give attention for labor pain and maternal awareness of labor pain management options. The result of this study is in line with study conducted in Zaria Nigeria in which 48.4% of respondent provide pain relief during labor, the most commonly use method was systemic opioid but in this study the most commonly used one was psychotherapy (36). The difference may be due to difference awareness about pharmacological methods and difference in socio demographic characteristics.

In this study use of non-pharmacological was 41.3% is in line with study conducted in Egypt which was 44.9% (10). In this study Psychotherapy was the most used non-pharmacological method. The finding is similar with a study conducted in Moshi, Tanzania most health care providers offer non-pharmacological methods like counseling about severity and nature of labor, psychological support and reassurance(42).

In this study the use of pharmacological methods was 4.6%, this result is differ from a study conducted in Colombia on unequal distribution of epidural analgesia in developed versus developing county which shows 75% in France, 71 Sweden and 31.5% in Colombia (43). This variation may be due to difference in socioeconomic status, a great awareness of laboring mother and professionals about pharmacological methods and availability of drug & materials in this developed country.

In current study knowledge, allow companionship and availability of drug and equipment were significantly associated with utilization of labor pain management methods. In this finding, that adequate knowledge of obstetric care giver is the higher odd of utilization of labor pain management methods. This result is inconsistent to the study conducted in Amhara region referral hospitals (40) and a study conducted in Kembata Tembaro Zone, Southern Ethiopia obstetric care give who had inadequate knowledge were more likely to use labor pain management methods than those who had adequate knowledge (39). The difference may be due to this study incorporate higher level professionals and all level of health institutions.

Allow companion for choice of laboring mother were significantly associated with utilization of labor pain management methods That obstetric care givers in institutions which allow companion is the higher the odd of utilization of labor pain management methods. Obstetric care givers who were in the institution which allow companion for choice of laboring mother were 2. 59 times more likely to utilize labor pain management methods than those who were in the institution not allow companion [AOR = 2.587, 95% CI= (1.322–5.063)].

Also availability of drug and materials were significantly associated with utilization of labor pain management methods. That is institutional availability of drug and material is the higher the odd of utilization of labor pain management methods. Obstetric care givers were 2.94 times more likely to utilize labor pain management methods when analgesia drug are availability in the institution than analgesia drugs not available. This result is in line with a study conducted in Kembata Tembaro Zone ,Southern Ethiopia (39) and Addis Ababa public hospitals ,obstetric care givers were less likely to utilize labor pain management method when drugs and materials were not available (44).

Even if it is not significant majority of respondents 211(69.2%) expect labor pain as it is severe pain and 161 (52.1%) prefer non-pharmacological labor pain management methods. Majorities 152 (49.8%) pattern of utilization was “sometimes”.

Conclusion And Recommendations

However relieving pain of laboring mother has a great initiating role in consumption of obstetric care providing services; in developing country including Ethiopia utilization of labor pain management methods and incorporating it in care delivery system is not get a consideration .This study shows that utilization of labor pain management methods was low. Professional knowledge, allow companion for maternal choice and availability of drug and equipment were significantly associated with utilization of labor pain management methods. So prepare standardizes management protocol based on research and

maternal exit interview, Prepare experience sharing program and onsite training for professionals to build and update their knowledge, Modifying their institution in a way that enable to manage laboring mother in a partition with their choice of accompany to increase their satisfaction and make avail necessary drugs and equipment is required for proper utilization of labor pain management methods.

Abbreviations

AOR
Adjusted Odds Ratio
CI
Confidence Interval
COR
Crude Odd Ratio
CSA
Central Statistical Agency of Ethiopia
LMIC
lower and middle income country
MCH
Maternal and Child Health
SPSS
Statistical Package for Social Sciences

Declarations

Ethical approval and consent for participation

The Ethical Review committee of Debre Markos University, Health Sciences College was approved this study and the letter of permission was secured from East Gojjam Zone Health Bureau. All the **methods that used in this study were carried out based on applicable guidelines and regulations**. Written informed consent from each study participants was obtained after providing appropriate information about the study and all the responses were kept confidential, anonymous and used only for research purpose.

Consent for publication

Not applicable

Availability of data and material

The data and materials that used to generate this manuscript and the manuscript itself can be accessed from the corresponding author through an email astershiferaw21@gmail.com.

Competing interests

The authors deny the presence of competing interests.

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Author's contribution

Aster Shiferaw Liben designs the proposal, recruited data collector, analyses the collected data and wrote the first draft thesis. Belsty Temesgen and Nakachew Mekonnen conceptualized again and give more concrete advice on the overall study. Wubie T and Worku Y are specifically carried out and rechecking the analysis and provide critically scientific advice. Aster Shiferaw edited and rewrote the final manuscript by incorporate all advice given by authors. At the end all authors reviewed and approved the final manuscript for publication.

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Figures

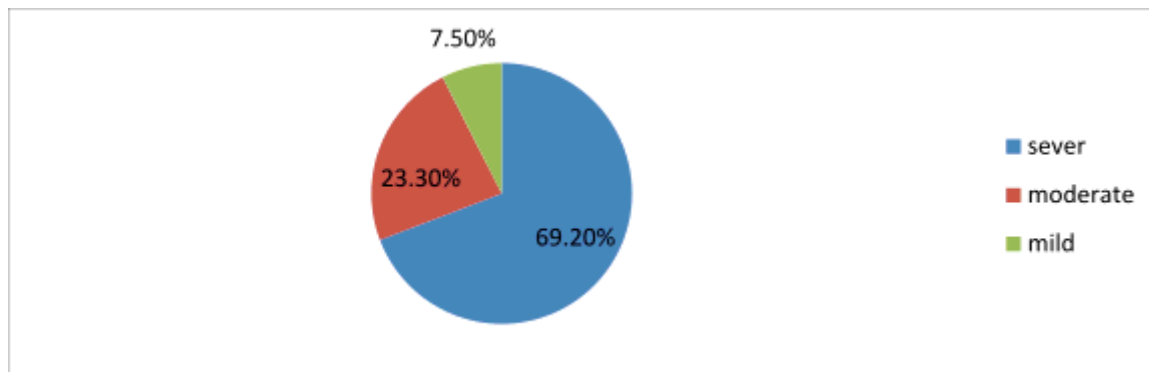


Figure 1

A pie chart shows obstetric care givers expectation of labor pain in public health institutions of East Gojjam Zone, Amhara, 2020.

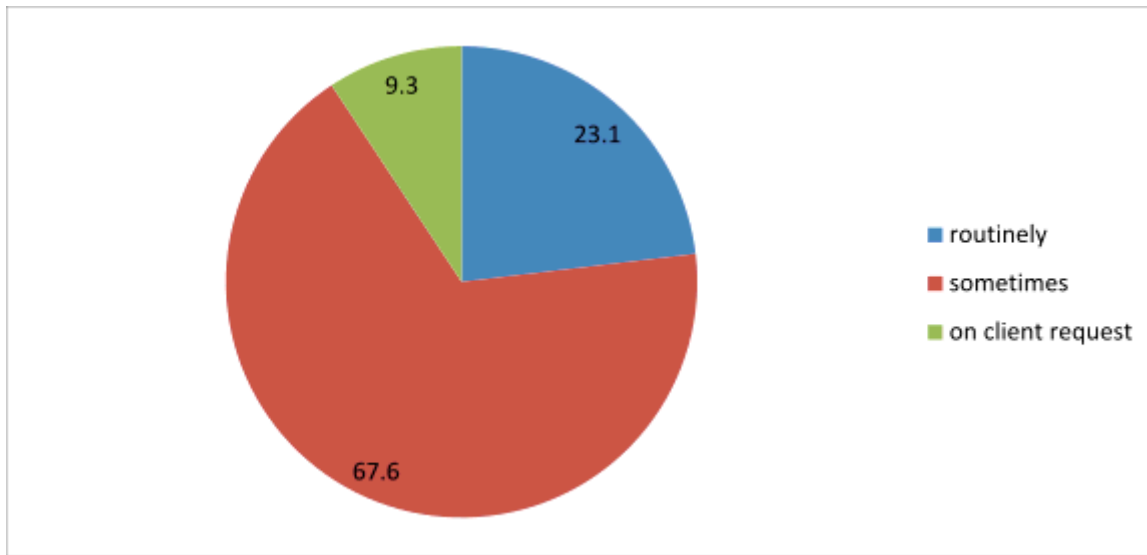


Figure 2

Pattern of utilization of labor pain management methods among obstetric care givers in public health institutions of east Gojjam zone, Amhara, 2020

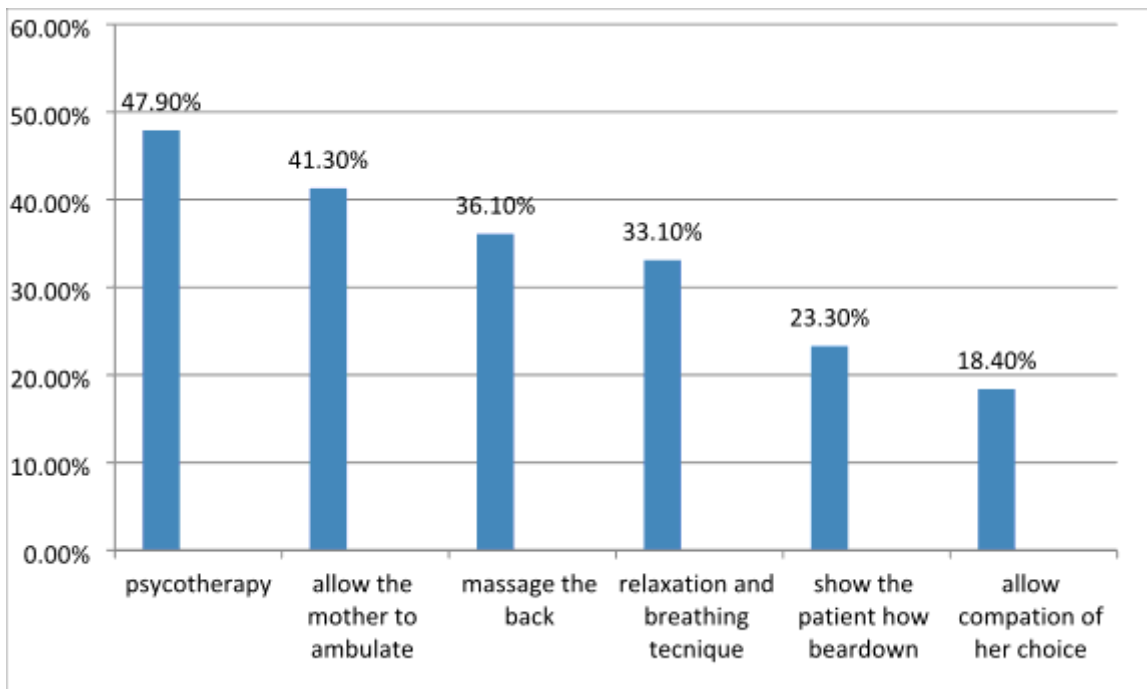


Figure 3

A bar chart shows utilization of non-pharmacological methods among obstetric care givers in public health institutions of east Gojjam zone, Amhara 2020.

Supplementary Files

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