Nonpharmacological pain relief for labour pain: knowledge, attitude, and barriers among obstetric care providers (#90896)

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Nonpharmacological pain relief for labour pain: knowledge, attitude, and barriers among obstetric care providers

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Background: Pain is an inseparable part of the labor process, and it should probably be managed without side effects for the mother, the progress of labor, and the infant. Nonpharmacological Pain Relief (NPPR) methods are the most recommended pain relief methods by the World Health Organization (WHO) during labor. This study evaluates NPPR for labour pain-related knowledge, attitude, and barriers among obstetric care providers (OCPs). **Methods:** A cross-sectional analytical study was performed at maternity departments in Maternal and Children Hospital (MCH), Najran, Saudi Arabia, from the beginning of April to the end of May 2023. The study involved 186 Obstetric Care providers (OCPs), physicians (19), nurses (144), and midwives (23). A structured self-reported questionnaire was used to collect data and involves five main sections; demographic data, work-related data, NPPR-related knowledge quiz, the attitude scale toward NPPR, and the perceived barriers scale to offer NPPR. Logistic regression was utilized to explore the associated factors to NPPR-related knowledge and attitude. **Results:** Over three-quarters (79%) of OCP had adequate knowledge of NPPR methods. The majority (85.5%) of the participants had a positive attitude toward NPPR in labour pain management, with the mean scores ranging from 3.55- 4.23 for all sub-items. OCPs acknowledged that patient belief, lack of time, and workload were the strongest barriers to offering NPPR methods for labour pain 67.6%, 64.5%, and 61.3%, respectively. In binary logistic regression analysis, the training related to NPPR and years of work experience were significantly associated with OCP's knowledge and attitudes regarding NPPR (p= <0.05). **Conclusion:** The current study results highlighted that although most participants had good knowledge and positive attitude regarding NPPR, they had numerous barriers related to its application in the practical setting. These barriers need to be considered and solved to enhance NPPR application and, consequently, provide a more positive birth experience.

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2   **barriers among obstetric care providers**

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Abstract

14   **Background:** Pain is an inseparable part of the labor process, and it should probably be managed without side effects
15   for the mother, the progress of labor, and the infant. Nonpharmacological Pain Relief (NPPR) methods are the most
16   recommended pain relief methods by the World Health Organization (WHO) during labor. This study evaluates NPPR
17   for labour pain-related knowledge, attitude, and barriers among obstetric care providers (OCPs).

18   **Methods:** A cross-sectional analytical study was performed at maternity departments in Maternal and Children
19   Hospital (MCH), Najran, Saudi Arabia, from the ~~beginning of April to the end of May~~ 2023. The study
20   involved 186 Obstetric Care providers (OCPs), physicians (19), nurses (144), and midwives (23). A structured self-
21   reported questionnaire was used to collect data and involves five main sections; demographic data, work-related data,
22   NPPR-related knowledge quiz, the attitude scale toward NPPR, and the perceived barriers scale to offer NPPR.
23   Logistic regression was utilized to explore the associated factors to NPPR-related knowledge and attitude.

24   **Results:** Over three-quarters (79%) of OCP had adequate knowledge of NPPR methods. The majority (85.5%) of the
25   participants had a positive attitude toward NPPR in labour pain management, with the mean scores ranging from 3.55-
26   4.23 for all sub-items. OCPs acknowledged that patient belief, lack of time, and workload were the strongest barriers
27   to offering NPPR methods for labour pain 67.6%, 64.5%, and 61.3%, respectively. In binary logistic regression
28   analysis, the training related to NPPR and years of work experience were significantly associated with OCP's
29   knowledge and attitudes regarding NPPR (p= <0.05).

30   **Conclusion:** The current study results highlighted that although most participants had good knowledge and positive
31   attitude regarding NPPR, they had numerous barriers related to its application in the practical setting. These barriers
32   need to be considered and solved to enhance NPPR application and, consequently, provide a more positive birth
33   experience.

34   **Keywords:** Nonpharmacological Pain Relive, knowledge, attitude, barriers, obstetric care providers.

35

36

Introduction

38   Pain is defined by the International Association for the Study of Pain as an unpleasant sensory and

39   emotional experience associated with actual or potential tissue damage (Raja et al., ~~2020~~ labour

40   pain is a complex human experience and is greatly affected by numerous factors

41   which make it a unique experience for each woman. However, labour pain is rated

42   as severe by the majority of women; 90% of them reported satisfaction with the

43   experience three months postpartum. This may be due to the positive labour

44   outcomes and the effective pain management during labour. ~~(Labor & Maguire,~~

45   ~~2008)~~ The anatomical and physiological explanation of labour pain illustrated that

46   it has two main components, visceral and somatic, and the process of cervical

47   dilation has contributing role in the two components. Visceral pain starts in the early

48   first stage and continues during the second stage of labour due to pressure created

49   by the uterine contraction on the cervix and lower uterine segment, leading to

50   stretching and distension and activating excitatory nocioceptive afferents. Alongside

51   the visceral Pain, Somatic Pain occurs in the late first and second stages of labour.

52   Somatic pain results from the severe stretching and ischemia generated by fetal

53   descent in the cervix, vaginal, perineum, and pelvic floor. (**Gonzalez et al., 2016,**

54   Labor & Maguire, 2008)

55   ~~Numerous physical and psychological factors can contribute to the severity of labour~~

56   ~~pain. Physical factors include frequency, duration, and intensity of contraction.~~

57   ~~Psychological factors include stress, anxiety, and fear. (Siyoum , Mekonnen., 2019)~~

58   ~~Inadequately controlled labor pain leads to negative or upsetting childbirth~~

59   ~~experiences. labour pain management is critical to improve the birth experience and~~

60   ~~decrease the incidence of postpartum depression. (~~Mo et al., 2022)

61   ~~Nonpharmacological pain relief (NPPR) methods can be utilized to reduce pain, alleviate suffering~~

62   ~~and enhance women's well-being during labour~~ (Heim & Makuch, 2022).

63   ~~NPPR methods are recommended by the World Health Organization (WHO), among other sources~~

64   ~~of pain relief, to provide a positive birth experience~~ (WHO, 2018). ~~These methods are safe for both~~

65   ~~mother and fetus, have no side effects, don't affect labour progress, are cost-~~effective, and delay

66   the use of pharmacological pain relief. NPPR help woman tolerate pain and have a more positive

67   birth experience (Smith et al., 2018; Boaviagem et al., 2017). Furthermore, NPPR reduces negative

68   outcomes associated with pharmacological pain relief methods and improves obstetric outcomes

69   (Gallo et al., 2018). Many women prefer NPPR methods such as music and massage therapy, heat

70   applications, deep breathing exercises, position change, aromatherapies, acupressure, relaxation,

71   acupunctures, transcutaneous electrical nerve stimulation (TENS), and hydrotherapy (Adams et

72   al., 2015; Boaviagem et al., 2017; Benfield et al., 2018).

73   Research indicates that the majority of women report being able to manage labor pain using NPPR

74   methods and reported high satisfaction with this approach (Czech et al., 2018). Therefore, OCPs

75   play a crucial role in managing pain, promoting patient comfort, and aiding in the recovery of

76   patients during their hospital stay. However, studies have shown that many hospitalized patients

77   do not receive nonpharmacological interventions for pain relief (Rantala et al., 2022), which can

78   negatively affect their physical, emotional, and spiritual well-being as well as increase postpartum

79   complications and healthcare costs (Karabulut et al., 2016).

80   The knowledge and attitude of nurses and other OCPs greatly influence the utilization of NPPR

81   methods. Unfortunately, some studies have found that nurses and OCPs have inadequate

82   knowledge and negative attitudes toward NPPR, resulting in the underutilization of these methods

83   (Kheshti et al., 2016; Eyeberu et al., 2022). Several barriers prevent OCPs from implementing

84   NPPR methods (Bradfield et al., 2019). Many OCPs doubt the effectiveness of NPPR compared

85   to pharmacological options (Boateng et al., 2019). Moreover, OCPs view NPPR methods as time-

86   consuming and impractical due to their heavy workload, inadequate staffing, and limited clinical

87   time (Klomp et al., 2016). In addition to limited knowledge, negative attitude toward NPPR and

88   choice of OCPs and patients can negatively affect the NPPR application. Among the pre-

89   mentioned barriers, the knowledge and attitude of the OCPs are the most vital (Bishaw et al.,

90   2020). Literature suggests further research on the barriers that prevent OCPs from offering NPPR

91   in maternity care (Boateng et al., 2019). NPPR is considered suitable to make labor pain more

92   controllable and tolerable. The first and most important step in NPPR application is to evaluate the

93   current situation. In Saudi Arabia, no studies in the international database are available to evaluate

94   the knowledge, attitude, and barriers to NPPR for labor pain. Therefore, the present study evaluates

95   NPPR-related knowledge, attitude, and barriers among OCPs in Najran, Saudi Arabia.

96

97   **Materials & Methods**

98   Add your materials and methods here.

99   **Study design and participants**

100   A cross-sectional analytical study was performed at maternity departments where labour is expected to occur (delivery

101   room, emergency department, and inpatient maternity departments) at Maternal and Children Hospital (MCH) /Najran,

102   KSA. Najran City is the administrative capital of Najran Province. It is located in southwest Saudi Arabia and has one

103 large specialized hospital for maternity and children, serving about 595,705 people. A convenience sample of OCPS

104 (nurses, midwives, and physicians) working in the previously mentioned departments in MCH and providing informed

105 consent was included in the study. OCPs with less than one year of work experience in the hospital were excluded

106 from the study.

107 **Sampling**

108 Epi info free sample size calculator was used to calculate the sample size. The total number of

109 OCPs working in the delivery room, emergency department, and inpatient maternity departments

110 was 245, according to the data obtained from the MCH administration. The parameters used for

111 sample size calculation were 99.9% CI, 5% margin error, and a power of 99%; the prevalence of

112 adequate NPPR-related knowledge was 54.2% % from the prior study**. (**Bishaw et al., 2020**)** The

113 calculated sample size was 179, and we added 10% for the estimated nonresponse rate and the

114 incomplete information. Thus, the required sample size was 197. In case of the selected OCPs

115 refused participation, they were replaced by another. The self-reported questionnaire was

116 distributed to all OCPs (n= 245), and 205 questionnaires were pooled. Then, 19 questionnaires

117 were excluded due to incomplete and inconsistent information, so 186 questionnaires were

118 analyzed. The participants in the current study were 19 physicians, 144 nurses, and 23 midwives

119 (Figure 1).

120

121 **Data collection**

122 The researchers developed a structured self-reported questionnaire based on recent similar studies **(Jira et al., 2020;**

123 **Mohamed et al., 2021)**. It is prepared in English and involves five main sections; demographic data, work-related

124 data, NPPR-related knowledge quiz, the attitude scale toward NPPR, and the perceived barriers scale to offer NPPR.

125 **The demographic data section** comprised age, religion, sex, nationality, marital status, educational level, and

126 monthly income.

127 **Work-related data section**s include; profession, years of work experience, provider-patient ratio, working hours,

128 availability of NPPR guidelines, and training related to NPPR.

129 **The knowledge section**: It was developed to evaluate the NPPR definition, main types, benefits, and physiological

130 background. The scale is composed of 8 dichotomous and multiple choice questions scored as the correct answer (2),

131 incomplete answer (1), and incorrect answer (0), inadequate knowledge considered at less than 60% (0- 9.5), and

132 adequate knowledge at 60% and more (9.6-16).

133 **The attitude section:** The scale comprises ten items to assess the OCPs' attitude toward NPPR rated on a 5-point

134 Likert scale ranging from strongly agree (5) to strongly disagree (1). The overall scale score ranged from 10-50; the

135 participants were considered to have a negative attitude if their overall score fell between 10-30 and positive if their

136 overall score fell between 31-50.

137 **The perceived barriers section**: the scale was developed to assess the perceived barriers to offering NPPR methods
138 in labour pain management. It comprised 12 statements rated on a 5-point Likert scale ranging from strongly agree
139 (5) to strongly disagree (1). The participants were considered to have barriers if they agreed and strongly agreed with
140 the response.

141 **Instrument validity and reliability**

142 The researchers developed the questionnaire; then, it was tested for face, content, and construct
143 validity by an expert panel of 4 professors of obstetric care and a biostatistician. The instrument's
144 reliability was assessed by Cronbach's Alpha test. The test results of attitudes, knowledge, and
145 perceived barriers sections were 0.77, 0.78, and 0.81, respectively.

146 **Data collection procedures**

147 Data collection started from the beginning of April to the end of May 2023. The researchers
148 disseminated the self-reported questionnaires in paper form to OCPs. To improve accessibility and
149 collaboration among OCPs, one of them was selected as a data collector. The data collector was
150 briefed on the research proposal, data collection instrument, and ethical considerations before
151 beginning data collection.

152 **Ethical considerations**

153 Ethical approval was obtained in four steps:1) approval from the deanship of scientific research at Najran
154 University (NU/DRP/MRC/12/2). 2) Approval from the ethical committee at Najran health affairs (IRB:
155 2023-06E), 3) permission from the hospital administration to begin data collection, 4) obtaining written
156 informed consent from participants. Participants were informed about their right to decline participation
157 without any consequences, and all data gathered was kept confidential and utilized for research purposes
158 only.

159 **Statistical analyses**

160 The data were entered into SPSS version 23, and the necessary analysis was done. The data was
161 analyzed using various methods such as number and percentage for categorical variables and mean
162 and standard deviation for numerical variables. Binary logistic regression was used to determine
163 the associated factors to NPPR-related knowledge and attitude, and an adjusted odd ratio (AOR)
164 was calculated with a 95% Confidence Interval (CI). The overall knowledge and attitude were
165 calculated by summing items, and the significant level was considered at $p < 0.05$.

166

167 # Results

168 **1: Participants' demographic variables:**

169   Of all study participants, 174 (93.5%) were females, with a mean age of 37.25±8.71 years.

170   Approximately half of them (48.4%) were Indian, and 47.8 % were Christian. Regarding marital

171   and educational status, 72.0 % were married, and 70.4% had Bachelor's degrees. About half

172   (48.9%) of the participants had enough monthly income (Table 1)

173   **2: Work-related factors to NPPR among OCPs:**

174   The majority (77.4%) of the participants were nurses; an equal proportion (56.5%) reported an

175   undetermined provider-patient ratio and worked eight hours per day. All (100.0) participants

176   reported not having the NPPR guideline in MCH. More than half (57.5%) received training related

177   to NPPR during their formal education, and only 12.9% received training sessions after

178   employment (Table 2).

179

180   **3. NPPR-related knowledge among OCPs:**

181   Over three-quarters (79.0%) of OCPs had adequate total knowledge about NPPR. Among the

182   participants, 87.1% knew the correct definition of NPPR, and 78.0% were aware of the NPPR

183   Benefits. Regarding the NPPR types, the majority of them were aware of the different types, such

184   as co-cognitive-behavioral, physical, emotional, environmental comfort, and patient-family

185   involvement 79.6%, 86.6%, 82.2%, 83.8%, and 78.5%, respectively. (Table 3)

186   **4. OCPs Attitudes toward NPPR:**

187

188   OCPs' attitudes toward NPPR are illustrated in Table 4. The majority (85.5%) of the participants

189   had a positive attitude toward NPPR in labour pain management, with the mean scores ranging

190   from 3.55- 4.23 for all scale items. The highest mean score was about the belief that they had a

191   responsibility and obligation to manage pain (4.23 ± 0.70); NPPR methods have lower side effects

192   than medication (4.15 ± 0.80) and can be used at home (4.22 ± 0.64). (Table 4)

193

194   **5. Barriers to offering NPPR methods among OCPs**

195   OCPs acknowledged that patient belief, lack of time, and workload were the strongest barriers to

196   offering NPPR methods in labour pain management 67.7%, 64.5%, and 61.3%, respectively. At

197   the same time, the lowest barriers related to insufficient motivation (6.5%) and lack of equipment

198   (16.1%) (Figure 2).

199   **6. Demographic and work-related predictors of NPPR knowledge and attitude among OCPs.**

200   In binary logistic regression analysis, the training related to NPPR and years of work experience

201   were significantly associated with OCPs' knowledge and attitudes. However, educational level was

202   found to be associated only with NPPR-related knowledge. A Master's degree qualification

203   [AOR=3.353 (0.964 - 11.335) p= 0.043] increased the probability of having adequate knowledge

204   by 3.3 times compared with a high diploma. Moreover, those participants who participated in in-

205   services training regarding NPPR were more likely to have adequate knowledge and positive

206   attitudes than those who didn't participate [AOR= 5.871 (2.174- 15.857) p= 0.000] and [AOR=

207   3.942 (1.926-11.380) p= 0.013], respectively. In addition, one year increase in work experiences

208   increased the OCPs' probability of having adequate knowledge and positive attitudes by 1.7 times

209 [AOR= 1.678 (1.080-2.564), p= 0.019] and [AOR= 1.740(1.188-2.548), p= 0.003], respectively.
210 (Table 5)

211 **Discussion**

212 labor is a unique experience where contradictory emotions are present. Pain is an inseparable part
213 of the labor process, and it should probably be managed without side effects for the mother, the
214 progress of labor, and the infant. NPPR is considered suitable to make labor pain more controllable
215 and tolerable. The first and most important step in NPPR application is to evaluate the current
216 situation. In Saudi Arabia, there are no available studies in the international database to evaluate
217 the knowledge, attitude, and barriers to NPPR application for labor pain; therefore, it's the first
218 Saudi study performed for this aim. In the present study, over three-quarters of the OCPs had
219 adequate knowledge about NPPR definition, benefits, main types, and physiological background.
220 In the same line, Eyeberu et al., 2022 found that 82.7% of the OCPs had adequate knowledge
221 regarding NPPR, and only 12.5% only knew all types of NPPR. The most known NPPR type
222 among their participants was psychotherapy and massaging. (Eyeberu et al., 2022) Besides,
223 Emelonye et al. illustrated that most of the midwives who participated in the study acknowledged
224 the husband's presence and support during labor as an important NPPR method, but only one-
225 quarter of them applied it in real practice. (Emelonye et al., 2017). in addition, Boateng et al.,
226 2019 explored the midwives and nurses' experience of NPPR utilization in a qualitative study.
227 They illustrated that the majority of their participants have good knowledge about NPPR but
228 demonstrated low knowledge regarding many types of it.

229 Furthermore, Bishaw et al. reported that 54.2% of their OCPs had satisfactory knowledge
230 regarding NPPR methods. The participants reported that psychotherapy, ambulation, massage,
231 patient education, and allow companionship were the most popular and known
232 nonpharmacological pain methods. (Bishaw et al., 2020) In addition, Jira et al. investigated the
233 nurses' knowledge and attitude regarding NPPR and its associated factors. They found that more
234 than half of their participants had adequate knowledge regarding NPPR benefits, while 38.3% did
235 not know its types. (Jira et al., 2020)

236 On the other hand, a recent Iranian study found that 73.6% of their healthcare providers had limited
237 knowledge regarding complementary and alternative therapy modalities. (Jafari et al., 2021) The
238 differences between the current study and the Iranian one related to knowledge score may be
239 related to the type of knowledge evaluated. The current study evaluated knowledge regarding

240 definition, modalities, benefits, and physiological background, while the Iranian one evaluated

241 only complementary and alternative therapy modalities. (Jafari et al., 2021).

242 The present study showed that most of the participants had a positive attitude toward NPPR

243 methods in labour pain management, with the mean scores ranging from 3.55- 4.23 for all items.

244 Labour and childbirth are considered normal physiologic processes by OCPs; therefore, a large

245 proportion of them thought that the use of pharmacological pain relief methods was unnecessary.

246 However, 87.6% of them perceive labour pain as severe and should be managed properly to

247 enhance a positive birth experience without using pharmacological pain relief methods, which may

248 delay labor and cause fetal distress. Consequently, a positive attitude toward NPPR is common

249 among midwives, obstetricians, and nurses. (Bishaw., 2020) Furthermore, an Egyptian study

250 illustrated that 69.0% to 89.7% of the OCPs had a positive attitude toward NPPR utilization during

251 the first stage of labor but reported little benefit from it during the second stage. (Mousa et al.,

252 2018) A recent Iranian study found that 79% of healthcare providers had a positive attitude toward

253 the utilization of NPPR, and they thought that both mind and body should be managed equally and

254 in a synchronized manner (Jafari et al., 2021). Besides, Jira et al. reported that around half of the

255 maternity nurses in their study have a positive attitude toward NPPR regardless of their ability to

256 apply it in clinical practice. They further added that NPPR is very effective for mild to moderate

257 pain and has little effect on severe Pain (Jira et al., 2020).

258 On the contrary, Eyeberu et al. studied the obstetrician's utilization and attitude toward NPPR for

259 Ethiopian women. They illustrated that although a high percentage of their participant utilized

260 NPPR methods, 65.5% of them had an unfavorable attitude toward it. Disparities between the

261 Ethiopian study and the current one may be due to participant sex, where 43.1% of their

262 participants were male compared to only 10.5% in the current study (Eyeberu et al., 2022).

263 Concerning barriers to offering NPPR methods, OCPs acknowledged that patient belief, lack of

264 time, and workload were the strongest barriers to providing NPPR methods during labour. At the

265 same time, the lowest barriers are related to insufficient motivation and lack of equipment. Most

266 NPPR methods require adequate training, time, and relaxation from the healthcare providers;

267 therefore, the current study reported a lack of time and high workload as the most significant

268 barriers to NPPR utilization. Along the same line, an Ethiopian study reported that lack of adequate

269 training, high patient flow, and the high workload was the most important barrier to NPPR

270 utilization (Bishaw., 2020). Furthermore, the nurse should have a strong belief and commitment

271   to the application of NPPR in order to overcome other obstacles to its implementation. The

272   qualitative study conducted by Boateng et al. reported that the most important barrier among their

273   participants was the strong belief in pharmacological pain relief compared with NPPR. They

274   elaborated that most midwives reported that NPPR might induce relaxation, but it doesn't take the

275   pain away. (Boateng et al., 2019) In fact, pain is an inseparable part of the normal labor experience

276   because of physiological reasons, and it has an important role in the labor process; therefore, it

277   needs to be tolerable and controllable but rarely relived using NPPR. NPPR can delay the use of

278   pharmacological analgesia and may decrease the dose required and consequently decrease the

279   expected side effects (Gallo et al., 2017, Bonapace et al., 2018). Mwakawanga et al. reported that

280   the limited number of healthcare providers and high workload discourage them from applying

281   NPPR or continuing its utilization, especially for some methods that require the continuous

282   presence of the OCPs (Mwakawanga et al., 2022). In the same line with the current study, the lack

283   of facilities to apply some NPPR methods and client beliefs regarding it were also reported barriers

284   (Bonapace et al., 2018). Other studies reported that many women were not ready to utilize NPPR

285   methods and preferred pharmacological ones. (Anarado et al., 2015, Thomson et al., 2019) In

286   addition, Mousa et al. reported that the most common barriers among their participants were

287   hospital-related factors such as lack of facilities, lack of policies and guidelines, and high

288   workload. They further added that clinician-related factors, such as their knowledge and attitude

289   toward NPPR, were important barriers to its utilization (Mousa et al., 2018).

290   In binary logistic regression analysis, the training related to NPPR and years of work experience

291   were significantly associated with OCPs' knowledge and attitudes regarding NPPR. However,

292   educational level was found to be associated only with knowledge. Moreover, those participants

293   who participated in in-service training regarding NPPR were more likely to have adequate

294   knowledge and positive attitudes than those who didn't participate. In addition, one year increase

295   in work experiences increased the OCPs' probability of having adequate knowledge and positive

296   attitudes by 1.7 times.

297   Most undergraduate health education programs did not give much attention to complementary and

298   alternative medicine. However, higher education may contain complete courses related to

299   complementary medicine, including NPPR methods. The current study showed that A master's

300   degree qualification increased the probability of having adequate knowledge by 3.3 times

301   compared with a high diploma. Bishaw et al., 2020 found that higher education increased the care

302 provider's probability of practicing NPPR by 3.45 times. Besides, Jira et al. reported that nurses

303 with postgraduate education reported a 12.2 times higher probability of having adequate

304 knowledge regarding NPPR methods compared to diploma nurses. They further added that nurses

305 with higher experience had a higher probability of having adequate knowledge when compared

306 with nurses who reported less than one year of experience. They further added that nurses who

307 received NPPR training had a 7.5 times higher probability of having higher knowledge and a 4.6

308 times higher probability of a positive attitude than nurses who never received training. (Jira et al.,

309 2020). The current study results highlighted that although most participants had good knowledge

310 and positive attitude regarding NPPR, they had numerous barriers related to its application in the

311 practical setting. These barriers need to be considered and solved to enhance NPPR application

312 and, consequently, provide a more positive birth experience.

313

314 **Study strengths and limitations**

315 This is the first study to evaluate OCPs' knowledge, attitude, and barriers to utilizing NPPR during

316 labour in Saudi Arabia. This study can provide a database for future NPPR utilization strategies in

317 Saudi hospitals. However, the desire for social acceptance and the nature of the self-reported

318 questionnaire may result in subjective bias.

319

320 ~~**Conclusions**~~

321 Most OCPs had adequate knowledge and a positive attitude regarding NPPR during labour. OCPs acknowledged that

322 patient belief, lack of time, and workload were the strongest barriers to offering NPPR for labour pain management.

323 At the same time, the lowest barriers are related to insufficient motivation and lack of equipment. Binary logistic

324 regression showed that training related to NPPR and years of work experience were significantly associated with

325 OCP's knowledge and attitudes regarding NPPR. However, educational level was associated only with NPPR

326 knowledge.

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330

331 **Acknowledgements**

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Table 1(on next page)

Participants' demographic variables (n= 186)

Table 1: Participants' demographic variables (n= 186)

Demographic data	No	%
Sex		
- Male	12	6.5
- Female	174	93.5
Age in years (mean ±SD)	37.25±8.71	
Nationality		
- Saudi	21	11.3
- Egyptian	17	9.1
- Sudanese	3	1.6
- Filipino	55	29.6
- Indian	90	48.4
Religion		
- Muslim	65	34.9
- Christian	89	47.8
- Hindu religion	25	13.4
- Others	7	3.8
Marital status		
- Single	48	25.8
- Married	134	72.0
- Divorced	2	1.1
- Widowed	2	1.1
Educational level		
- High diploma	41	22.0
- Bachelor's degree	131	70.4
- Master's degree	14	7.5
Monthly income		
- Not enough	79	42.5
- Enough	91	48.9
- Enough and can save	16	8.6

Table 2 (on next page)

Work-related factors to NPPR among OCPs (n= 186).

Table 2: Work-related factors to NPPR among OCPs (n= 186).   1

Work-related factors	No	%
Profession		
- Physician	19	10.2
- Nurse	144	77.4
- Midwife	23	12.4
Providers: patient ratio		
- 1:4	33	17.7
- 1: 6	10	5.4
- 1: 8	38	20.4
- Undetermined	105	56.5
Working hours		
- 8	105	56.5
- 12	62	33.3
- More than 12	19	10.2
availability of guidelines for using NPPR in the unit.		
- Yes	0	0.0
- No	186	100.0
Training related to NPPR		
- Never received	41	22.0
- Yes, during my formal education	107	57.5
- yes, during my postgraduate education	14	7.5
- Yes, training session after employment.	24	12.9
Years of experience (mean ±SD)	10.71±6.59	

2

Table 3(on next page)

NPPR-related knowledge among OCPs (n= 186).

Table 3: NPPR-related knowledge among OCPs (n= 186).

NPPR-related knowledge	Correct answer	
	No	**%**
Definition of NPPR	162	87.1
The main types of NPPR.		
- Co-cognitive-behavioral	148	79.6
- Physical	161	86.6
- Emotional	153	82.2
- Environmental comfort	156	83.8
- Patient-family involvement	146	78.5
Benefits of NPPR	145	78.0
NPPR methods have a physiological background in the body.	147	79.0
Total knowledge		
- Inadequate	39	21.0
- Adequate	147	79.0

3

Table 4(on next page)

OCPs Attitudes toward NPPR (n= 186).

Table 4 OCPs Attitudes toward NPPR (n= 186).

Statement	Mean	SD
I think that NPPR methods are		
Have lower side effects than medication	4.15	0.80
Lower cost	3.76	0.88
More available	3.65	0.80
Patient-centered	3.55	0.73
Building trust in the therapeutic relationship	4.03	0.68
It can be used at home.	4.22	0.64
More relaxing	3.84	0.90
More available	4.08	0.73
Necessary for managing Pain	4.15	0.80
The belief that you have a responsibility and obligation to manage Pain	4.23	0.70
Total attitudes score	**No**	**%**
- Negative	27	14.5
- Positive	159	85.5

Table 5(on next page)

Demographic and work-related predictors of NPPR knowledge and attitude among OCPs.

AOR: Adjusted Odd Ratio CI: Confidence Interval *significant at p$^<$0.05

Table 5 Demographic and work-related predictors of NPPR knowledge and attitude among OCPs.

| Demographic / work-related predictors	Knowledge		Attitude	
	AOR (95% CI)	p	AOR (95% CI)	p
Sex				
- Male	Ref		Ref	
- Female	1.382 (0.284-6.726)	0.689	1.315 (.342- 4.913)	
Nationality				0.534
- Saudi	Ref		Ref	
- Egyptian	2.492 (.656-9.473)	0.180	0.618 (0.336 -1.060)	0.084
- Sudanese	1.305 (.348- 4.900)	0.693	0.959 (0.398 -2.313)	0.919
- Filipino	1.059 (0.292-3.834)	0.931	0.921(0.516 -1.658)	0.817
- Indian	1.882 (0.527- 6.718)	0.330	1.530 (0.570 - 4.081)	0.377
Religion		0.336		0.792
- Muslim	Ref		Ref	
- Cristian	0.858(0.663- 1.165)	0.342	1.034 (0.677 -1.645)	0.861
- Hindu religion	0.481 (0.100-2.321)	0.362	1.070 (0.625 -1.804)	0.779
- Others	0.393 (0.038-4.11)	0.436	1.063 (0.727 -1.535)	0.783
Marital status				0.756
- Single	Ref	0.340	Ref	
- Married	0.479 (0.160-1.431)	0.187	1.010 (0.989- 1.052)	0.340
- Divorced	0.704 (0.247-2.002)	0.510	0.987 (0.889 - 1.116)	0.948
- Widowed	0.718 (0.249-2.070)	0.540	0.920 (0.775 -1.065)	0.200
Educational level		0.017*		0.328
- High diploma	Ref		Ref	
- Bachelor's degree	1.234 (0.857 - 3.334)	0.557	0.954(0.912 - 1.019)	0.102
- Master's degree	3.353 (0.964 - 11.335)	0.043*	0.827 (0.416 -1.738)	0.621
Monthly income		0.643		
- Not enough	Ref		Ref	0.685
- Enough	0.857 (0.348-2.114)	0.738	0.835 (0.274 - 2.566)	0.771
- Enough and can save	0.797 (0.333-1.910)	0.611	3.637(0.146 - 85.770)	0.411
Age in years	0.963 (0.90-1.029)	0.263	0.975 (0.913-1.065)	0.724
Profession		0.556		0.431
Physician	Ref		Ref	
Nurse	0.302 (0.021-4.327)	0.378	1.305(0.776-2.524)	0.242
Midwife	0.504 (0.025- 10.354)	0.657	1.328(0.515-3.307)	0.532
Providers: patient ratio		0.831		0.375
1:4	Ref		Ref	
1: 6	0.663 (0.102-4.321)	0.667	0.881(0.653-1.187)	0.434
1: 8	1.549 (0.369- 6.495)	0.550	1.270(0.665-2.339)	0.458
Undetermined	1.239 (0.400-3.841)	0.710	0.873(0.645-1.189)	0.438
Working hours		0.921		0.685
8	Ref		Ref	
12	1.152 (0.424-3.130)	0.781	0.845 (0.274 - 2.566)	0.771
More than 12	0.851(0.2083.492)	0.823	3.647 (0.146 - 85.770)	0.410
Training related to NPPR				0.014*
Never received	Ref	0.004*	Ref	
Yes, during my formal education	5.750 (0.658-50.235)	0.114	2.864(1.231-6.643)	0.024*
yes, during my	5.333 (0.638- 44.579)	0.122	2.458(0.987-6.117)	0.040*

postgraduate education				
Yes, in-service training sessions.	5.871 (2.174- 15.857)	0.000*	3.942(1.926-11.380)	0.013*
Years of experience	1.678(1.080-2.564)	0.019*	1.740(1.188-2.548)	0.003*

AOR: Adjusted Odd Ratio   CI: Confidence Interval   *significant at p<0.05   3

Figure 1

Participants flow chart
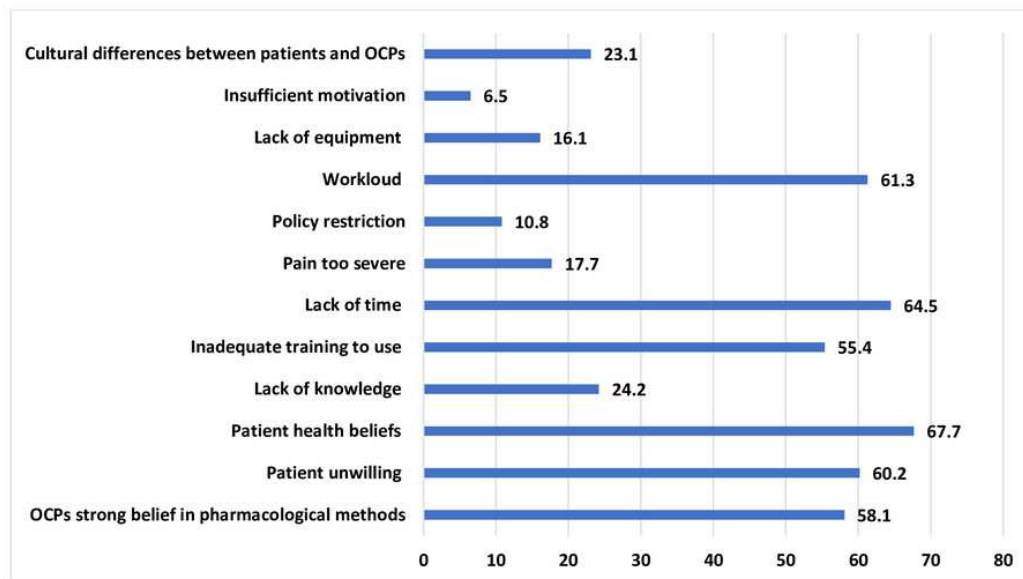
Participants flow chart
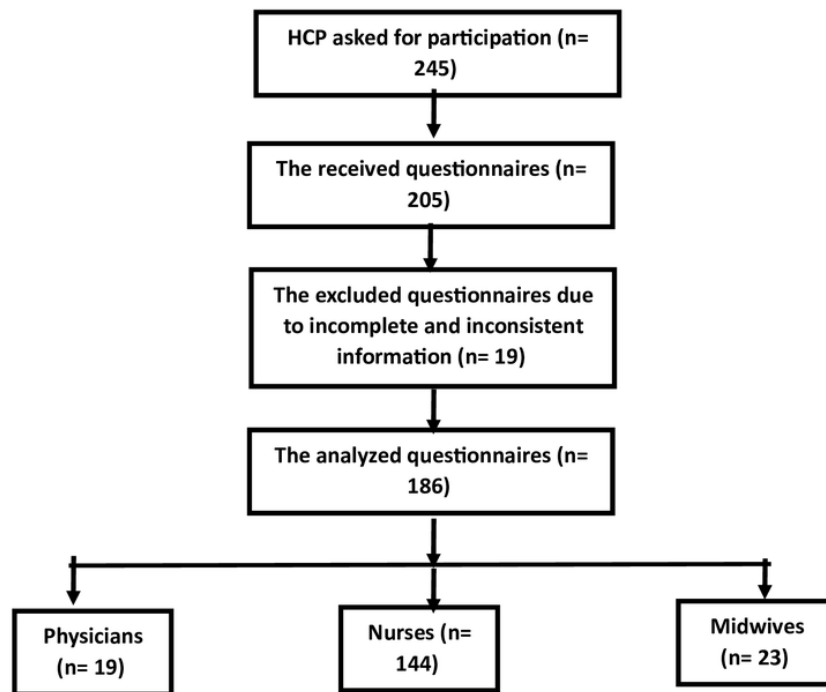
Figure 1 Participants flow chart

Figure 2

Barriers to offering NPPR methods among OCPs

Barriers to offering NPPR methods among OCPs

Note: The total is not mutually exclusive

Figure 2 Barriers to offering NPPR methods among OCPs