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## Original Research Article

# Influence of demographic profiles and spinal anaesthesia procedures on patients with treated and untreated coffee related to post dural puncture headache pain score

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## ABSTRACT

**Introduction:** Post Dural Puncture Headache (PDPH) is an iatrogenic complication of spinal anaesthesia (SP) and has devastating consequences.

**Aim:** To assess the effect of Coffee on occurrence of PDPH in post-operative patients of Interventional and control groups by comparing the mean PDPH pain scores related to demographic profiles and spinal anaesthesia procedures.

**Materials and Methods:** An experimental approach in which 60 patients were recruited from the accessible population and was further allocated randomly to Interventional (30) and Control (30) groups. The patients were compared the demographical profiles viz. age, education and marital status and spinal anaesthesia procedures viz. surgery types, needle size and amount of fluid intake related to PDPH pain scores by Numerical Rating Scale after administration of three doses (130mg caffeine in 150ml) of coffee at intervals of 12hrs in Interventional group and only routine care in control group.

**Results:** The main findings in this study were that the incidence of PDPH is lower in Interventional group compared to control group with statistically significant difference ( $P < 0.001$ ) but it is not influenced by demographic profiles as well as SP procedures in Interventional group compared to control group without statistically significant observation after 24 hrs, 48hrs and 72hrs NRS pain score, respectively.

**Conclusion:** The use coffee is an effective, safe, non-invasive treatment for prevention of PDPH.

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## 1. Introduction

Spinal anaesthesia (SP) is considered the safest and widely accepted form of anaesthesia in Obstetric and Gynaecological surgical practice. Although, this technique is known as safer, but reported to have increased incidences of post dural puncture headache (PDPH).<sup>1</sup> First described by August Bier in 1898 and classically presents as a postural headache following therapeutic or diagnostic interventions of the epidural or spinal space. According to

the International Headache Society, the criteria for a low cerebrospinal fluid (CSF) pressure PDPH includes headache that develops <7 days after a spinal puncture, occurs or worsens <15 minutes after assuming the upright position and improves after <30 minutes in the recumbent position. The accompanying symptoms are usually nausea, vomiting, and neck stiffness. The incidence of PDPH is estimated to be between 30-50% following diagnostic or therapeutic lumbar puncture, 0-5% following spinal anaesthesia and up to 81% following accidental dural puncture during epidural insertion in pregnant woman.<sup>2</sup> Global incidence of this entity varies between 5-30%,<sup>3</sup> whereas in India,

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an observational study highlights the incidence of PDPH to be 14% following spinal anaesthesia.<sup>4</sup> About 90% of PDPHs occur within 3 days of the procedure and 66% start in the first 48 hours.<sup>5</sup> Occurrence of PDPH varies from 1% to 40%, according to needle gauge, needle orientation, bevel orientation, operator's skill level and presence of risk factors such as young age or previous history of PDPH.<sup>5</sup> An incidence based study on SP concluded that female gender and bigger size of needle are major contributory factors for developing PDPH.<sup>6</sup>

Furthermore, the soothing factors for PDPH is lying down without pillow and dark, quite environment. Time of its first occurrence ranged from several hours to days after dural puncture but mostly in 90% of cases it takes place during the first 5 days post-operative and specifically in the first three days. Usually, PDPH is self-limited at about 5-7 days among 80-85% of cases and it rarely lasts longer than two weeks.<sup>7,8</sup>

Moreover, Caffeine was first reported as a treatment of PDPH in 1949.<sup>9</sup> The Caffeine is well known central nervous system stimulant and is believed to treat PDPH by causing cerebral vasoconstriction. The oral intake of caffeine is more safe, easy and acceptable by large population and is used for treatment of multiple headache situations and proved to be helpful by earlier studies.<sup>10,11</sup> This may generate immediate adjuvant analgesic characteristics in many pain circumstances.<sup>12</sup> It is also known to cause cardiovascular vasoconstriction and may be helpful to relieve postprandial hypotension and other hypotension conditions as PDPH.<sup>13</sup> In addition, worldwide Coffee is the most popular drink and it contains caffeine.<sup>14</sup> The medical benefits had been discovered for coffee as protect against Parkinson's and Alzheimer disease due to its stimulant effect.<sup>15</sup> Many investigators have been emphasized the benefit of drinking coffee after spinal anaesthesia post-operative care of PDPH.<sup>8,16,17</sup>

It was attempted to know the effect of coffee on occurrence of PDPH in post-operative patients of Interventional group compared between Control group on mean PDPH pain scores related to demographic profiles and SP procedures.

## 2. Materials and Methods

### 2.1. Study design

The present study was conducted over a period of six weeks at the Obstetrics and Gynaecological ward of a tertiary care centre at Kolkata. This study adopted a post-test only control design as two groups were selected, and intervention was introduced to the Interventional group (administration of Coffee) whereas routine care was instituted to the control group (without administration of Coffee). Patients admitted to the ward for surgeries (Obstetrics and Gynaecology) under SP during the study period fulfilling the inclusion

criteria were selected. This population was easily accessible for the clinical experience during this period. The samples were designed accordingly with following inclusions and exclusions criteria. The sample randomization (simple method of randomization) was done by using lottery system to select Interventional group and control group.

### 2.2. Inclusion criteria

1. Patients above 18 years and up to 70 years of age
2. Patients who were scheduled to undergo Obstetrical and Gynaecological surgeries with ASA-I grading as per pre-anaesthetic check-up.
3. Patients who are willing to participate in the study.

### 2.3. Exclusion criteria

1. Patients who were at a high risk to develop immediate post-operative complications.
2. Patients with high risk co morbidities like pregnancy induced hypertension, renal ailments, severe anaemia, and metabolic disorders.
3. Patients on regular pain medications for any chronic ailments.

### 2.4. Sample size

A total sample size of 60 patients was considered in which allocated 30 patients in each group as Interventional group and control group. Initially, a total 67 samples were inducted in the present study, which was subsequently allocated into 34 and 33 in Interventional and control group, respectively. An attrition of 4 and 3 samples in Interventional and Control group was observed. Thus, the sample allocation was considered a total of 60 post-operative patients.

### 2.5. Research tool

These tools facilitate the observation and measurement of the variables of interest. Accurate and appropriate data collection is imperative for any study and depends upon the selection of tool used for the same. Tool selection was done keeping in mind the nature and purpose of the study, distribution of target population, time frame of study, age groups, and literacy level of the samples. Therefore, a PDPH pain assessment through numerical rating scale (NRS) pain tool was used between Interventional and control group.

### 2.6. Preparation and administration of Coffee for Interventional group

Preparation of black coffee using 150ml of hot water and reconstituting with 2 sachets of coffee powder (contained 3gm of caffeine) procured from local shop. No sugar was added. Administration of the prepared black coffee to interventional group on the day of surgery after initial oral fluid intake and on ensuring no immediate complications

like abdominal distension, bloating, nausea or vomiting. Administration of black coffee in same doses twice at an interval of 12hrs apart on first post-operative day along with routine care to patients belonging to interventional group along with standard care. Control groups were provided only routine post-operative care.

### 2.7. Study of demographic profiles

The demographic profiles such as age, education level, and marital status, were studied between Interventional group and control group

### 2.8. Study of spinal anaesthesia procedure

The spinal anaesthesia procedures as per needle size and surgery types were studied between Interventional group and control group.

### 2.9. Study of PDPH pain score

PDPH pain assessed by Numerical Rating Scale (NRS) tool, which obtained as a segmented numeric version of the visual analogue scale with 0-10 integers. As per the scale, participants were asked about pain intensity and marked as 0 i.e., “no pain”, 1-3 i.e., “mild pain”, 4-7 i.e., “moderate pain”, and 8-10 i.e., “severe pain”, respectively after 24hrs, 48hrs and 72hrs of spinal anaesthesia considering it as Observation one, two and three, respectively between Interventional group and control group.

### 2.10. Statistical analysis

Descriptive and inferential statistics was utilized to analyse the data. SPSS version 20 used for analysis and interpretation of raw data. Sample characteristics described in terms of frequency and percentage. Chi Square used for test of homogeneity among both groups. Unpaired and Paired ‘t’ test for comparing the means of PDPH pain scores and observations of demographic parameters among and within the groups. The ‘t’ test was considered the most relevant statistical test for computing the data. ANOVA was used to compare the selected demographic variables and SP procedure with the mean PDPH pain scores in Interventional group and

## 3. Results

### 3.1. Demographic profiles among study groups

The comparative analysis of samples as per demographic profiles viz. age, education level, and marital status between Interventional and control group (Table 1). For age, the computed Chi square value of 3.143, which was lesser than the table value of 11.07 at 5 df with p value >0.05, confirmed that both groups were homogenous in nature. For education, the computed Chi square value of 1.928 obtained

at 5 df, which was lesser than the table value of 11.07 with  $p > 0.05$ , confirmed homogeneity of both groups. For marital status, majority of patients (96.67%) were married, and rest participant was widow (3.33%) in which the statistically computed Chi square value of 1.017 at 3 df, which was lesser than table value of 3.841 with  $p > 0.05$ , established that both groups were homogenous.

### 3.2. Study of spinal anaesthesia procedures

The comparative analysis of samples as per needle size used for SP and types of surgery between Interventional and control group (Table 2). The groups were homogenous in respect to the use of needle size depicted by the statistically calculated Chi square value of 1.143 at 2df, which is lesser than the table value of 5.99 at  $p > 0.05$ . In the case of type of surgery under SP. The calculated Chi square value obtained was 1.200 at 2 df, which was lesser than the table value of 5.99 for p value >0.05, which ascertained that both groups were homogenous in nature.

Table 3 indicates that the mean fluid intake of samples in Interventional group during first 24hrs post-surgery was  $2.93 \pm 0.45$  litres whereas in Control group it was  $2.97 \pm 0.32$  litres. The statistical analysis computed using the unpaired ‘t’ test yielded a value of 0.331 with p value of 0.742, suggested that there was no significant difference in the fluid intake between both the groups.

### 3.3. Comparative study of PDPH pain scores by NRS

In Table 4, The data for Mean  $\pm$  SD describes the comparison of PDPH Pain scores between Interventional and Control group at different observations of 24hrs, 48hrs and 72hrs. In all observations, a highly statistically significant differences ( $p < 0.001$ ) were observed in Interventional group in comparison with control group.

### 3.4. Comparative study of PDPH pain scores by NRS related to demographic profiles

Table 5 describes the comparison of mean  $\pm$  SD of PDPH scores of various age groups in Interventional and Control group at various observations i.e., NRS at 24hrs, 48hrs and 72hrs, respectively. The computed ‘F’ value using the ANOVA test inferred a value of 1.297 (p value = 0.298) for 24hrs, value of 0.768 (p value = 0.582) at 48hrs and 0.491 (p value = 0.779) at 72hrs, respectively in Interventional group at df 5. Hence no relationship could be established between age groups and mean PDPH Pain scores in Interventional group. The computed ‘F’ value of 0.082 (p value = 0.969) at 24hrs, 0.821 (p value = 0.494) at 48hrs and 1.341 (p value = 0.283) at 72hrs, which was lesser than the table value at df 3 statistically, confirms no relationship of various age groups with mean PDPH Pain scores in Control group. Hence overall it extrapolates that when age groups of Interventional group and Control group were

**Table 1:** Distribution of samples as per demographic profiles in Interventional and Control group

	Interventional (n = 30)	%	Control (n = 30)	%
<b>Age groups (Years)</b>				
<20	1	3.33	0	0
21 – 30	15	50.0	13	43.33
31 – 40	5	16.67	7	23.33
41 – 50	6	20.0	6	20.0
51 – 60	2	6.67	4	13.33
>60	1	3.33	0	0
Chi square = 3.143, p value 0.678, df = 5, table value $\chi^2 = 11.07$ mean age = 31.46				
<b>Education level</b>				
Illiterate	2	6.67	2	6.67
Higher Secondary	17	56.67	20	23.33
Graduate/ post-Graduate	11	26.67	8	20
Chi square = 1.928, p value 0.859, df = 5, table value $\chi^2 = 11.07$				

n = Number; % = Percentage

**Table 2:** Distribution of subjects as per different spinal anaesthesia procedures in Interventional and Control group

	Interventional (n = 30)	%	Control (n = 30)	%
<b>Size of the needle (Gauge)</b>				
18	-	-	1	3.33
25	26	86.67	26	86.67
26	04	13.33	3	10.00
Chi square = 1.143, p value 0.565, df = 2, table value $\chi^2 = 5.99$ mean size of needle = 23				
<b>Types of surgery</b>				
Minor	2	6.67	1	3.33
Major	15	50.0	12	40.0
LSCS	13	43.33	17	56.67
Chi square = 1.200, p value 0.549, df = 2, table value $\chi^2 = 5.99$				

n = Number; % = Percentage; LSCS = Lower segment Caesarean section

**Table 3:** Distribution of samples as per the amount of fluid administered post-surgery in Interventional and Control group (Mean  $\pm$  SD)

Groups	Fluids Intake for 24hrs (Post- surgical Period)	t	p value
Interventional (Mean $\pm$ SD)	2.93 $\pm$ 0.45	0.331	0.742
Control (Mean $\pm$ SD)	2.97 $\pm$ 0.32		

SD = Standard deviation, df = 58

**Table 4:** Comparison of PDPH pain scores by NRS between Interventional and Control group (Mean  $\pm$  SD)

PDPH Pain Scores by NRS	Interventional group (n = 30) (Mean $\pm$ SD)	Control group (n = 30) (Mean $\pm$ SD)	t	p value
Obs 1 (24 hrs)	0.10 $\pm$ 0.403	2.33 $\pm$ 2.77	4.37	<0.001
Obs 2 (48 hrs)	0.10 $\pm$ 0.54	2.77 $\pm$ 2.82	5.07	<0.001
Obs 3 (72 hrs)	0.33 $\pm$ 0.80	2.63 $\pm$ 2.85	4.24	<0.001

Obs = Observation, n = number, SD = Standard deviation, df = 58

compared to NRS–Pain scores at 24hrs, 48hrs and 72hrs, no statistically significant comparison could be established between various age groups and mean PDPH Pain scores as the computed ‘F’ values at various observations were lesser than the table values at p value >0.05. Hence the age factor had no impact on occurrence of PDPH.

Table 5 depicts the comparison of mean  $\pm$  SD PDPH scores of Interventional and Control group at various observations i.e., NRS at 24hrs, 48hrs and 72hrs with their educational levels. The statistically computed ‘F’

value of 0.614 (p value >0.05) at 24hrs, 0.420 (p value >0.05) at 48hrs and 0.742 (p value >0.05) at 72hrs in Interventional group was found to be lesser than the table value statistically, which confirms educational qualification has no relationship with mean PDPH Pain scores in Interventional group. The statistically computed ‘F’ value of 0.628 (p value >0.05) at 24hrs, 0.921 (p value >0.05) at 48hrs and 1.159 (p value >0.05) at 72hrs, respectively was found to be lesser than the table value in Control group comparing education level with mean  $\pm$  SD PDPH Pain

scores at three observations. Hence, it can be inferred that educational qualification had no relevance to PDPH Pain Scores, in both the groups.

### 3.5. Comparative study of PDPH pain scores by NRS related to spinal anaesthesia procedures

Table 6 extrapolates the comparison of mean  $\pm$  SD PDPH pain scores at various observations viz. NRS at 24hrs, 48hrs and 72hrs with types of surgery undergone by patients in both groups i.e. Interventional and Control group. The computed value of 'F' in Observation at 24hrs revealed 0.920 (p value 0.410), and 0.482 (p value 0.623) at Observation at 48hrs and 0.793 (p value 0.463) at 72hrs, respectively in the Interventional group was found to be lesser than table value at df 2, and the statistically computed 'F' value of 0.434 (p value  $>0.05$ ) at 24hrs, 0.503 (p value  $>0.05$ ) at 48hrs and 0.773 (p value  $>0.05$ ) at 72hrs, respectively was found to be lesser than the table value in Control group comparing type of surgery with mean  $\pm$  SD PDPH Pain scores at three observations, which confirmed that type of surgery has no relationship with the occurrence of PDPH as shown by statistical test.

## 4. Discussion

The age group of 21-30 years is also very crucial for this study as younger age groups have significantly higher incidence of developing PDPH when compared with older groups. Further decreased elasticity to low intensity of dural fibres or diminished reactivity of cerebral vessels may be a contributing factor for decrease incidence of PDPH in older population. An observational study determined the incidence and prediction of PDPH and influence of age, gender, needle size, number of punctures, duration of recumbency, needle bevel direction, revealed that females were more prone to develop PDPH and further suggested that lower age group was more susceptible to develop PDPH, which is evident from p value of  $<0.05$ .<sup>18</sup> Therefore, the age plays a significant role in occurrence of PDPH is strengthened but the present study confirmed that both groups were homogenous in nature related to PDPH as per earlier study.<sup>8</sup>

Educational status does play a vital role in a person's psychology and is directly related to pain perception. To strengthen the point that educational status plays a vital role in a person's psychology and is related to pain perception, which observed an impact of education on post-operative perception of pain clearly stated that the patients with lower education were found to experience more pain than patients of higher education in all post-operative days.<sup>19</sup> But, the present study has a similarity with an earlier study that education had no relevance to PDPH pain scores in both the groups.<sup>8</sup>

The samples in both groups of this study were administered approximately equal volume of fluids during the first 24hrs of surgery. Enhanced hydration remains a popular therapy for PDPH but there is no scientific evidence to suggest that vigorous hydration has any therapeutic effect on patients. Research studies recommends normal hydration to be administered post-surgery, however, patient should not be allowed to become dehydrated as it is known to cause headache.<sup>20</sup> Prospective studies have demonstrated that the incidence of PDPH is not related to increase fluid intake per se as there is no documented evidence to fortify a direct correlation between CSF production and intravascular volume status.<sup>21</sup> These lines are in accordance with the findings of an observational study on PDPH in SP where it was seen that oral and intravenous fluids is a common mode of relief measure for PDPH, which was used effectively prophylactically and curatively in 82.6% and 17.4% of study participants.<sup>6</sup>

Both the groups had minimal percentage of samples who underwent minor surgeries. The present study was ascertained that both groups were homogenous in nature. The earlier study was observed majorly on CS as Interventional group compared to control group without significant difference and a similarity was observed in the present study as per earlier studies, but it was observed majorly on CS as Interventional group.<sup>8</sup>

In this present study Quincke needles of size 18G, 25G and 26G were used for lumbar puncture (LP) for administration of SP. Needle size is crucial to limit the occurrence of PDPH as brought out by various studies.<sup>2,5,6,21</sup> A meta-analysis focuses on the importance smaller needle size to reduce the occurrence of PDPH was discussed in detail highlights the type of needle is of significant importance in the development of PDPH. However, an alarming finding that a smaller size of needle increases the failure rates of puncture thereby posing a risk for multiple punctures was also noticed. An investigation mentions that the chances of developing PDPH are as high as 25% when a 25G needle is used for LP.<sup>22</sup> Contrary to these findings it was seen that less refined and thicker spinal needles increases the hazard and influences the incidence of PDPH. Convincing results for CS summarized that a 27G Whitacre needle was preferred to a 25G Quincke needle where the incidence of PDPH was 45% and 20%, respectively with the mentioned size of needles.<sup>2</sup> The present setting chosen by the researcher employed Quincke 25G needle mostly for LP as it was routinely used and preferred by the Anaesthetist mainly because of its availability.

The comparison of PDPH pain scores between Interventional and Control group at different observations of 24hrs, 48hrs and 72hrs were observed significant difference ( $P<0.001$ ). The present study is supported by other investigators that PDPH pain score was decreased

**Table 5:** Comparison of PDPH pain scores with different age groups in interventional and Control groups (Mean ± SD)

Groups	Age groups (Years)	NRS at 24 hrs	NRS at 48 hrs	NRS at 72 hrs
<b>Interventional group (n = 30) (Mean ± SD)</b>	<20	0.00	0.00	0.00
	21 – 30	0.00	0.00	0.47 ± 0.99
	31 – 40	0.40 ± 0.89	0.00	0.60 ± 0.89
	41 – 50	0.00	0.50 ± 1.22	0.00
	51 – 60	0.50 ± 1.22	0.00	0.00
	F value	1.297	0.768	0.491
	P value	0.298	0.582	0.779
<b>Control group (n = 30) (Mean ± SD)</b>	<20	0.00	0.00	0.00
	21 – 30	2.46 ± 3.282	3.23 ± 3.032	2.85 ± 2.882
	31 – 40	1.86 ± 2.85	1.57 ± 2.88	1.29 ± 2.56
	41 – 50	2.50 ± 2.43	2.33 ± 2.25	2.33 ± 2.58
	51 – 60	2.50 ± 2.082	4.00 ± 2.944	4.75 ± 3.304
	F value	0.082	0.821	1.341
	P value	0.969	0.494	0.283
<b>Interventional group (n = 30) (Mean ± SD)</b>	<b>Education level</b>			
	Illiterate	0.00	0.00	0.00
	Primary	0.33 ± 0.58	0.00	0.47 ± 0.99
	Higher Secondary	0.00	0.33 ± 1.00	0.67 ± 1.12
	Senior Secondary	0.00	0.00	0.00
	Graduate	0.25 ± 0.71	0.00	0.25 ± 0.71
	Post-Graduate	0.00	0.00	0.67 ± 1.15
F value	0.614	0.420	0.742	
P value	0.690	0.830	0.599	
<b>Control group (n = 30) (Mean ± SD)</b>	Illiterate	3.50 ± 2.12	6.00 ± 1.41	6.00 ± 1.41
	Primary	2.40 ± 2.30	2.80 ± 2.00	3.60 ± 3.36
	Higher Secondary	2.00 ± 2.83	3.00 ± 2.94	2.86 ± 2.79
	Senior Secondary	3.38 ± 3.204	2.94 ± 2.50	2.79 ± 2.00
	Graduate	1.67 ± 3.20	2.67 ± 3.78	2.17 ± 3.37
	Post-Graduate	0.00	0.00	0.00
	F value	0.628	0.921	1.159
P value	0.680	0.485	0.358	

Obs = Observation, SD = Standard deviation, df = 5

**Table 6:** Comparison of PDPH pain scores with types of surgery undergone in Interventional and Control groups (Mean ± SD)

Groups	Age groups (Years)	NRS at 24 hrs	NRS at 48 hrs	NRS at 72 hrs
<b>Interventional group (n = 30) (Mean ± SD)</b>	Minor	0.00	0.00	0.00
	Major	0.20 ± 0.56	0.20 ± 0.77	0.20 ± 0.56
	LSCS	0.00	0.00	0.54 ± 1.05
	F value	0.920	0.482	0.793
	P value	0.410	0.623	0.463
<b>Control group (n = 30) (Mean ± SD)</b>	Minor	0.00	0.00	0.00
	Major	2.67 ± 2.27	3.00 ± 2.45	3.25 ± 2.83
	LSCS	2.24 ± 3.15	2.76 ± 3.13	2.35 ± 2.91
	F value	0.434	0.503	0.773
	P value	0.652	0.610	0.472

Obs = Observation, SD = Standard deviation, df = 2

after the administration of coffee in the Interventional groups compared to control group.<sup>8,17</sup>

No statistical difference could be established between the various age groups and the mean PDPH pain scores. Therefore, it was seen that the age has no influence on occurrence of PDPH. Hence, the age could be regarded as a contributory factor is to be explored by doing further studies on a bigger sample size so as to generate the generalizability of this particular aspect. It is contrary to earlier study, which advocates the lower age to be a predisposing factor for magnus problem of PDPH.<sup>22</sup> Another study compared two different types of needles suggested that mild to moderate PDPH was reported in two out of four randomly allocated groups and the findings can be correlated to the present study as there was no statistically significant comparison could be derived out of the various age groups when compared with PDPH severity. Hence, the age factor cannot be a reliable criterion for presumption of occurrence of PDPH.<sup>23</sup> A study highlighted that the more severe pain related restrictions were found in those who were less educated and older.<sup>24</sup> Since the present study set up did have educated samples, so the chances of alteration due to low education level in pain perception could be negated.

The sample population of the present study can be identified with an earlier study on management of accidental puncture and prophylaxis of PDPH in which 18 labour analgesia patients and 60 patients of LSCS were at risk and 2 each in both had accidental dural puncture. Hence, the findings can be correlated to the present study as the sample population was females and consisted of obstetrics cases too, hence putting the study participants at risk of developing PDPH.<sup>25</sup>

Overall results of present study are illustrated that there were no statistically significant differences between Interventional (Coffee administered) and control groups regarding patients' demographic profiles viz age, marital status, and level of education as well as surgery procedures, which are supported by previous studies.<sup>8,17,19</sup>

## 5. Conclusion

PDPH after SP is a common complication, which can encounter a post-operative patient and can be treated with coffee as an established intervention. The results of present study can aid clinicians to use coffee as an effective, safe, non-invasive treatment for prevention of PDPH, which is found a lower incidence in Interventional group compared to control group but the PDPH and prevention by using coffee drink cannot be influenced by the demographic profiles age, education, and marital status as well as spinal anaesthesia procedures viz. surgery types, needle size and fluid intake related to NRS pain score.

## 6. Limitations

Routine postoperative analgesic administration as advised by the physician in PDPH may conceal the pain perception,

its intensity and subsequently resulting in reduced PDPH pain scores for both Interventional and Control group, which could have affected the results of the study. Very small sample size selected for the present study.

## 7. Recommendation

Future study is suggested with more sample size. Further studies can be taken up and thoroughly followed up so as to get an in-depth understanding of the effectiveness of Coffee.

## 8. Source of Funding

None.

## 9. Conflict of Interest

None.

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