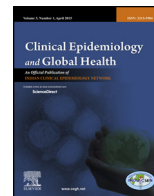




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Original article

## A cross sectional study assessing the knowledge and attitudes towards lumbar puncture among the staff of a public university in Malaysia

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### ABSTRACT

**Problem considered:** Lumbar puncture (LP) refusal rates of as high as 30% have been reported in developing countries. Without LP, the patients may suffer suboptimal treatment or unnecessary complications from their disease. Due to a lack of studies exploring the reasons behind this LP refusal, no solution has been suggested to address this problem. Therefore, we carried out this study with the aim of determining knowledge of and attitude towards LP among the public.

**Methods:** A cross-sectional survey study among staff in a public university in Malaysia was conducted using stratified random sampling. Self-administered questionnaires were sent to 500 staff members from April to August 2015. The questionnaire, which included questions on demography, knowledge and attitude towards LP, was pre-tested and validated (Cronbach's alpha = 0.701).

**Results:** A total of 316 of 500 (63%) responded, of which 294 were complete and analysed. The median (IQR) age was 34 and 65% were female. 80% had tertiary education. The mean knowledge score was  $6 \pm 3$ ; 74% were categorised into poorly informed, 23% moderately informed, and 3% well-informed. The mean attitude score was  $35 \pm 4$ ; 3% were categorised as having poor attitude, 72% moderate attitude, and 27% good attitude. Respondents with higher education had a higher knowledge and attitude score ( $p = 0.001$ ), while respondents afraid of needles had a lower attitude score ( $p = 0.019$ ). Total knowledge scores and total attitude scores showed a positive correlation ( $r = 0.272$ ,  $p = 0.001$ ).

**Conclusion:** The public are not adequately informed about LP, leading to the unreceptive attitudes towards LP consent. Therefore, the public should be educated about LP to create better awareness.

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## 1. Introduction

Lumbar puncture (LP), also known as spinal tap, is a routine procedure to obtain cerebrospinal fluid (CSF) for either diagnostic or therapeutic indications for neurological diseases. Even though LP is important, from our clinical experience we found that some patients refuse consent.<sup>1,2</sup> Likewise, some parents are reluctant to give consent for LP to be done on their children.<sup>3,4</sup> One study

identified that fear of complications and the conviction that LP is unnecessary are the main reasons behind LP refusal.<sup>5</sup> Without LP, patients may have to undergo unnecessary empirical treatment such as intravenous antivirals or broad spectrum antibiotics which increase the risk of antibiotic resistance. This may lead to prolonged hospital stays, increased hospitalisation costs, and added burdens on the health service.

LP refusal has been reported in some developing regions such as Malaysia,<sup>3,6</sup> Africa,<sup>7,8</sup> Iran<sup>9</sup> and Saudi Arabia.<sup>5</sup> The refusal rate of LP is about 30% as shown by two studies.<sup>3,6</sup> Due to the lack of studies exploring the reasons behind this LP refusal, no solution could be suggested to address this problem. Therefore, we carried out this study with the aim of identifying the public knowledge of

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and attitude towards LP. We also aimed to identify differences in knowledge and attitude of LP and the associations among respondents. The results will help develop suitable interventions to resolve the problems of LP refusal and thus improve acceptance of LP among the public.

## 2. Methodology

We carried out a cross-sectional study among Malaysian staff in a public university in Malaysia using stratified random sampling. The sampling units included 13 faculties after exclusion of medical and veterinary faculty. Respondents from each faculty were then chosen by simple random sampling by using SPSS. Based on approximately 2540 staff members from the included faculties and adjusted for an 80% response rate, the minimum calculated sample size required was 291 (CI 1.96). Self-administered questionnaires were sent to 500 staff members from April to August 2015. Respondents gave consent in writing to participate in this study and all data collected were kept confidential. Ethical approval for the study was obtained from the Institutional Review Board of the University of Putra Malaysia.

The questionnaire, adapted from two previous study,<sup>7,9</sup> was translated to Bahasa Malaysia and pre-tested and validated on 38 non-medical staff (Cronbach's alpha = 0.701). It included measures to assess baseline demographic and socioeconomic data, knowledge and attitude towards LP. The socio-demographic questions comprised of age, gender, ethnicity, education level and monthly income groups. Questions on previous experience, awareness of LP, and fear of needles were also included. The knowledge section consisted of 18 questions mainly concerning the nature of the procedure, indication and complication of LP. One score was given for each correct response. Respondents with a knowledge score <50% were considered as poorly-informed, with 50–75% moderately-informed and >75% well-informed. The attitude section consisted of 10 questions with Likert scale, whereby 1 to 5 scores were given for each question. An attitude score of <50% was considered poor, 50–75% was moderate, and >75% was good.

The data was analysed using SPSS Version 21.0. A chi-square test was used to assess the significance of association between socio-demographic characteristics and levels of knowledge and attitudes towards LP. The alpha level of significance was set at a value of 0.05. Incomplete questionnaires with missing responses to the knowledge and attitude questions were excluded. For those with missing demographic data, the denominator was used based on the available responses.

**Table 1**  
Socio-demographic characteristics of respondents.

Socio-demographic characteristics	N	(%)	
Age (years)	20–29	66	22.4
	30–39	126	42.9
	40–49	54	18.4
	50–59	40	13.6
	60–69	5	1.7
Gender	Male	102	34.7
	Female	192	65.3
Ethnicity	Malay	264	89.8
	Chinese	24	8.2
	Indian	6	2.0
Occupation	Academic staff	96	32.7
	Administrative staff	70	23.8
	Supporting staff	128	43.5
Education level	Secondary	58	20
	Tertiary	236	80

## 3. Results

Out of 500 questionnaires distributed, a total of 316 (63%) received a response, of which 294 were complete and analysed. [Table 1](#) shows the socio-demographics of the respondents. The median (IQR) age of the respondents was 34 (range 30–41) and 65% were female. A majority were Malays at 90%, and about 80% of the respondents had tertiary education.

The questionnaires showed that about 82% of respondents were aware about LP, but none had experienced LP themselves. While four respondents had a previous medical history that required them to consent for LP, none of them consented.

From the 18 knowledge questions, the mean score was  $6 \pm 3.74\%$  were categorised into poorly informed, 23% were moderately informed, and 3% were well informed. [Table 2](#) shows the frequency of responses regarding knowledge of LP. For the attitude questions, the mean score was  $35 \pm 4$ , of which 3% were categorised with poor attitude, 72% with moderate attitude, and 27% with good attitude. Respondents were also asked whether they would consent or not consent should LP be indicated for them. 42% would agree, 14% would disagree, and 45% were undecided. [Table 3](#) shows the frequency of responses regarding attitude towards LP.

Educational levels and occupation of the respondents were significantly associated with both knowledge and attitude score ( $p = 0.001$ ). Academic staff and respondents with a Master's or PhD had the highest scores for both knowledge and attitude towards LP ( $p < 0.001$ ). In addition, respondents with awareness of LP had significantly higher knowledge scores regarding LP ( $p = 0.001$ ). In terms of attitude towards LP, respondents who were afraid of needles had significantly lower scores than those who were not ( $p = 0.019$ ). [Table 4](#) shows the association between the demographics, awareness of LP and fear of needles with the knowledge and attitude of LP.

This study also found a significant positive correlation between total knowledge scores and total attitude scores towards LP ( $r = 0.272$ ,  $p = 0.001$ ). The higher the total knowledge scores, the better the total attitude scores towards LP.

## 4. Discussion

LP is important for diagnostic evaluation of CSF and may also be therapeutic in certain neurological diseases. However, a few studies have reported negative patients attitudes towards LP.<sup>3,5–7,9</sup> A qualitative study in UAE showed that parents who refused LP for their child had fear of complications (75%), the perception that LP was unnecessary (21%), and distrust of the motives behind the request for consent. About 50% were adamant for total refusal of LP. In addition, almost one third were unfamiliar with LP indications.<sup>5</sup>

Likewise, this study showed that the public were poorly informed about LP and undecided on the procedure. In addition, attitudes towards LP were found to be directly related to level of knowledge. Those with higher knowledge exhibited better attitude towards LP and vice versa, similar to the findings by Borhani-Haghighi et al.<sup>9</sup> They found that about 90% of the respondents had poor knowledge associated with negative attitudes towards LP ( $P < 0.0001$ ).

This study also revealed that higher educated respondents had better knowledge about LP, a phenomenon which has been demonstrated by studies on stroke and diabetes mellitus.<sup>10,11</sup> This shows that educated society are more receptive to health related issues. Cutler et al. postulated in an economic study that individuals with higher education have different thinking process and decision-making patterns.<sup>12</sup> In addition, they found that spending on health education is a worthwhile investment which would significantly improve population health.<sup>13</sup>

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