

Obstructive sleep apnoea and its knowledge and attitude among Indian anaesthesiologists - A survey study

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ABSTRACT

Background and Aims: Obstructive sleep apnoea (OSA) has an estimated prevalence of 2%–4% in adult population and is increasing. Most of these are detected late which is the cause for higher perioperative morbidity. This survey was aimed to seek the level of knowledge and attitude of Indian anaesthesiologists towards OSA. **Methods:** The OSA Knowledge and Attitude (OSAKA) questionnaire (23-statements) was distributed to the anaesthesiologists attending the difficult airway conference in December 2017. The first section has 18 statements pertaining to OSA knowledge. The second section consists of five statements to evaluate self-confidence in the management of OSA. Age, gender, professional title, type of hospital, years of experience, and bariatric experience were analysed. **Results:** 205 out of 350 participants responded. In all, 201 (57.4%) fully completed responses were analysed. The mean \pm standard deviation knowledge and attitude scores were 12.01 ± 2.88 (66.72% \pm 16%) and 18.16 ± 3.75 (72.64% \pm 15%) respectively. On exclusion of junior residents ($n = 56$), knowledge and attitude scores of qualified anaesthesiologists were 12.7 ± 2.55 (70.55% \pm 14.16%) and 18.78 ± 3.91 (75.12% \pm 15.64%), respectively. Anaesthesiologists with bariatric experience had a significantly higher attitude score when compared with those who do not practice bariatric surgeries ($P < 0.01$). There is weak but significant, positive linear correlation between knowledge and attitude score ($r_s = 0.370$, $P < 0.01$). **Conclusion:** Deficit of adequate knowledge about OSA exists among Indian anaesthesiologists. Experience of managing cases with OSA seems to improve knowledge and attitude towards OSA.

Key words: Anaesthesiologists, attitude, obstructive, sleep apnoea, surveys and questionnaires

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INTRODUCTION

Obstructive sleep apnoea (OSA) is a growing disorder in modern society. Community-based epidemiological studies from several parts of India have estimated that the prevalence of OSA is 2.4%–4.9% in men and 1%–2% in women.^[1] Increasing incidence of obesity can further swell up the population suffering from OSA. It has been demonstrated that the incidence is substantially higher in the bariatric surgery patients (up to 70%). A large group of patients with moderate or severe OSA may remain undiagnosed and untreated due to lack of awareness among the patients and their physicians. Stigma associated with snoring and poor availability of centres doing polysomnography studies are other factors which

make the diagnosis of OSA difficult.^[2] Untreated OSA can lead to multiple cardiovascular, neurological and haematological complications, and make these patients prone to perioperative complications. To standardise the management of patients with OSA, the American Society of Anesthesiologists has issued guidelines for intraoperative management of OSA in 2006.^[3]

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Studies have suggested that educational interventions for physicians are needed to improve the identification and treatment of patients with OSA.^[4,5] With an intention to develop the educational strategies for physicians, Schotland and Jaffe developed Obstructive Sleep Apnoea Knowledge and Attitude (OSAKA) questionnaire [Appendix].^[6] Before this questionnaire was developed, there was only one survey instrument – ‘ASK ME’ which did not focus on OSA particularly. Data obtained from the response of 115 out of 236 physicians in Washington University Physicians Network were used to formulate OSAKA questionnaire. This questionnaire was then used in various countries to objectively assess the knowledge and attitude of physicians towards OSA. In India, with increasing population and incidence of obesity, anaesthesiologists are likely to encounter the patients with OSA more frequently in their practice. Hence, we conducted this survey to assess the knowledge and attitude of Indian anaesthesiologists towards cases with OSA.

METHODS

This survey protocol was exempted from review by Institutional Ethics Committee of Tata Memorial Centre Mumbai – India (IEC/1117/1985/001, dated November 21st, 2017). This survey study was conducted in accordance with the principles of Declaration of Helsinki 2013. The printouts of OSAKA questionnaire were distributed to the Indian anaesthesiologists (faculty and delegates) attending Tata Memorial Centre – Difficult Airway Conference (TMC-DAC) in December 2017. This was a national-level conference attended by the anaesthesiologists from all over India. *A priori* written informed consent was not taken. Successful filling and returning of the questionnaire was considered as consent for participation in the survey. Participants consisted of trainee junior residents, doctors working in teaching institutes, government hospitals, private hospitals, and freelance anaesthesiologists.

The OSAKA questionnaire^[6] is a self-administered 23-item questionnaire. It takes less than 10 minutes to be completed. The first section has 18 statements covering five domains: (1) epidemiology, (2) pathophysiology, (3) symptoms, (4) diagnosis and (5) treatments pertaining to OSA knowledge. Knowledge items are in a true-or-false format along with ‘do not know’ choice as a third response to minimise the effect of guessing. It is scored as an incorrect response during the response rate calculations. Each correct answer was given a score

of 1. Incorrect answers and questions which were not attempted were scored as zero. A total of 18 questions are there in first section with a maximum score of 18 and lowest score of zero. A high score indicates more knowledge and low score indicates lack in knowledge about OSA and its management.

The second section consists of five statements: two statements regarding the importance of identifying patients with OSA before anaesthesia and three statements to evaluate the service providers’ self-confidence in the management of patients with OSA during the perioperative period. The response to attitude questions was measured on a 5-point Likert scale, ranging from 1 to 5 (1 = strongly disagree; 2 = disagree; 3 = neither agree nor disagree; 4 = agree; and 5 = strongly agree). It carries a maximum score of 25 and lowest score of 5. A high score indicates more confidence and attitude and low score indicates lack in confidence about OSA identification and its management among anaesthesiologists.

Demographic data included age, gender, professional title (professor, associate professor, assistant professor, senior resident, trainee junior resident or freelance consultant anaesthesiologist), type of hospital (teaching hospitals/institutes or non-teaching hospitals) and number of years of practice after post-graduation.

Data were presented using descriptive statistics. Wilcoxon–Mann–Whitney *U*-test was used to assess the significant differences in total knowledge and attitude scores between the anaesthesiologist’s gender, age, professional title and number of years in practice. Rank analysis of covariance (ANCOVA) was also applied to verify the eventual significant difference in the attitude score and anaesthesiologist’s characteristics. *P* values below 0.05 were considered statistically significant. Spearman’s correlation was used to calculate the correlation between knowledge and attitude score.

RESULTS

Out of 350 distributed copies of OSAKA questionnaire, 205 responses were collected. Four out of 205 responses were excluded because those were incompletely filled. Thus, we had a response rate of 57.4% (201/350), and we assumed that a response rate of >50% is reliable.

Demographic data including age, gender, professional titles and number of years of anaesthesia practice are

shown in Table 1. The mean and standard deviation (SD) knowledge score (%) was 12.01 ± 2.88 ($66.72\% \pm 16\%$). The mean and SD attitude score was 18.16 ± 3.75 ($72.64\% \pm 15\%$). None among the 201 participants was able to correctly answer the entire set of 18 knowledge statements. The mean and SD of the total score obtained for the domains of epidemiology, pathophysiology, symptoms, diagnosis and treatment of OSA were 1.68 ± 0.87 , 3.18 ± 0.88 , 3.07 ± 0.93 , 2.05 ± 0.95 and 2.02 ± 1.05 respectively [Table 2].

Table 1: Demographic profile of participants

Demographic parameters	Value
Age in years, mean \pm SD, n=201 (100%)	35.99 \pm 9.91
Gender, n=199 (98%)	
Male	94 (46.8%)
Female	105 (52.2%)
Professional title, n=201 (100%)	
Trainee Junior resident	56 (27.9%)
Post MD resident	46 (22.9%)
Assistant or associate professor/associate consultant	37 (18.5%)
Professor/consultant	33 (16.4%)
Freelance anaesthesiologist	29 (14.4%)
Total number of years in practice, median (range)	9 (0-37)

SD – Standard deviation; n – number of response with data available

Table 2: Knowledge score in different domains of OSA

	Maximum	Mean \pm SD
Total score of 18-item questionnaire	18	12.01 \pm 2.88
Total score about epidemiology of OSA	3	1.68 \pm 0.87
Total score about pathophysiology of OSA	4	3.18 \pm 0.88
Total score about symptoms of OSA	4	3.07 \pm 0.93
Total score about diagnosis of OSA	3	2.05 \pm 0.95
Total score about treatments of OSA	4	2.02 \pm 1.05

OSA – Obstructive sleep apnoea; SD – Standard deviation

Anaesthesiologists with bariatric surgery experience had a higher mean percentage knowledge score (72.61 ± 12.72 vs 69.61 ± 17.66) than their counterparts although the difference was not statistically significant ($P = 0.24$) but they had a significantly higher attitude score (80.08 ± 15.12 vs 72.88 ± 15.44 , $P=0.01$) than anaesthesiologists with no experience of bariatric surgeries [Table 3]. There is no difference in percentage knowledge and attitude scores between male and female anaesthesiologists and anaesthesiologists from teaching or non-teaching hospitals. ANCOVA rank analysis confirmed statistically significant difference in knowledge ($P < 0.01$) and attitude score ($P < 0.01$) of different professional titles.

Since 27% of our participants in this survey were trainee students of anaesthesiology, we did a separate analysis of qualified anaesthesiologists excluding the trainee residents. The mean percentage knowledge and attitude scores of trainee students were significantly less than those of qualified anaesthesiologists [Table 3]. Among qualified anaesthesiologists, the mean and SD knowledge score was 12.7 ± 2.55 ($70.55\% \pm 14.16\%$). The mean and SD attitude score was 18.78 ± 3.91 ($75.12\% \pm 15.64\%$). Among the qualified anaesthesiologists, the differences in the knowledge and attitude scores according to age and number of years of practice were found to be non-significant. The results of the subset analysis are shown in Table 3.

There is weak but significant, positive linear correlation between knowledge and attitude score

Table 3: Knowledge and attitude score analysis in qualified anaesthesiologists and junior trainee residents

Parameters	Subgroups	Knowledge percentage (Mean \pm SD)	P	Attitude percentage (Mean \pm SD)	P
Total score	All qualified anaesthesiologists	70.55 \pm 14.16		75.12 \pm 15.64	
Age (years)	36 or younger	68.55 \pm 15.55	0.08	72.92 \pm 16.48	0.08
	>36	72.61 \pm 12.27		77.44 \pm 14.4	
Gender	Male	71.44 \pm 14.94	0.47	73.92 \pm 16.52	0.41
	Female	69.72 \pm 13.55		76.04 \pm 14.88	
Years of experience	8 or less	69.33 \pm 15.33	0.26	73.12 \pm 16.92	0.09
	>8	71.94 \pm 12.55		77.52 \pm 13.84	
Bariatric anaesthesia experience	Yes	72.61 \pm 12.72	0.24	80.08 \pm 15.12	0.01
	No	69.61 \pm 17.66		72.88 \pm 15.44	
Professional title	Trainee junior resident	56.95 \pm 16.42	<0.01	66.28 \pm 10.89	<0.01
	Post MD resident	72.70 \pm 15.26		73.30 \pm 15.71	
	Assistant or associate professor/associate consultant	69.21 \pm 13.40		76.85 \pm 17.7	
	Professor/consultant	73.57 \pm 12.5		79.75 \pm 11.13	
	Freelance anaesthesiologist	65.32 \pm 14.21		70.48 \pm 16.32	
Trainee Junior Residents vs. Qualified Anaesthesiologists	Trainee junior residents	56.95 \pm 16.42	<0.01	66.28 \pm 10.89	<0.01
	Qualified anaesthesiologists	70.53 \pm 14.18		75.11 \pm 15.66	

SD – Standard deviation

among the Indian anaesthesiologists ($r_s = 0.370$, $P < 0.01$) [Figure 1].

DISCUSSION

An important finding of this survey is the deficit in the knowledge about OSA among anaesthesiologists with special interest in difficult airways. Also, trainee students of anaesthesiology were found to have significantly less scores than qualified anaesthesiologists. Anaesthesiologists with higher experience and higher professional titles were found to have better knowledge and attitude towards OSA. To our knowledge, this is the first survey of knowledge and attitude towards OSA among Indian anaesthesiologists. Similar surveys had been conducted among anaesthesiologists and physicians regarding awareness about OSA in other parts of the world.^[4,7]

Corso *et al.*, by a similar survey, demonstrated deficit of knowledge about OSA and its treatment among Italian anaesthesiologists.^[7] When compared with a survey by Corso *et al.*, participants in our survey were comparatively young in age (mean age: 36 vs 45 years) and experience (median 8 vs 15 years). The mean knowledge score of Indian anaesthesiologists was better than that of Italian anaesthesiologists. The percentage of correct responses given by the Indian anaesthesiologists participating in this survey was similar to the Italian survey (66%)^[7] and slightly better than the survey by Wang *et al.* (62%).^[4] Erbaş *et al.*^[8] did OSA survey by asking a different set of questions among 134 Turkish anaesthesiologists and found that although 97% of anaesthesiologists felt that the diagnosis of OSA is important, only 53% of anaesthesiologists were found to be confident of recognising patients with OSA. As

compared with Turkish anaesthesiologists, percentage knowledge about OSA diagnosis and management domains were 68% and 50.5%, respectively, in Indian anaesthesiologists.

When compared with anaesthesiologists, practitioners from other specialties were found to have better knowledge with an average of knowledge responses of 76% in the Schotland and Jeffe survey,^[6] 78% among family practitioners,^[9] 79% in cardiologists and internists^[5] and 67% for paediatricians.^[10] These results could have been because of better training programs and frequent encounters with patients having OSA in the clinical practice and higher number of OSA-related publications in various specialties other than anaesthesiology.

In our survey, trainee students were found to have significantly less knowledge and attitude scores than qualified anaesthesiologists. With increase in age, experience and higher professional titles, the knowledge and attitude towards OSA improved. In addition, those who practice anaesthesia for bariatric surgery were found to have better attitude towards OSA than those who do not practice anaesthesia for bariatric surgeries. These results show that Indian anaesthesiologists gain knowledge of OSA out of their professional experience and practice. The formal education regarding the diagnosis and management of OSA during post-graduation training in anaesthesiology seems lacking. Teaching time for sleep disorders and its perioperative management during anaesthesia residency training program is not known. Students in anaesthesiology do not get formal training about OSA in their curriculum. As a result, trainee students have poor knowledge of OSA and this reflects in their poor attitude scores as well.

To nullify the effect of trainee students on overall knowledge and attitude score, we performed a subgroup analysis of qualified anaesthesiologists excluding trainee students. In this analysis, differences in the knowledge and attitude scores according to age and number of years of anaesthesia practice were found to be non-significant. No difference in the knowledge and attitude scores was found between genders. Good performance was noticed in the Indian anaesthesiologists in the 'attitude' questionnaire. This is in contrast to the findings of Corso *et al.* where significant difference in the attitude score between gender and professional title was found, indicating that care givers overestimated their ability.

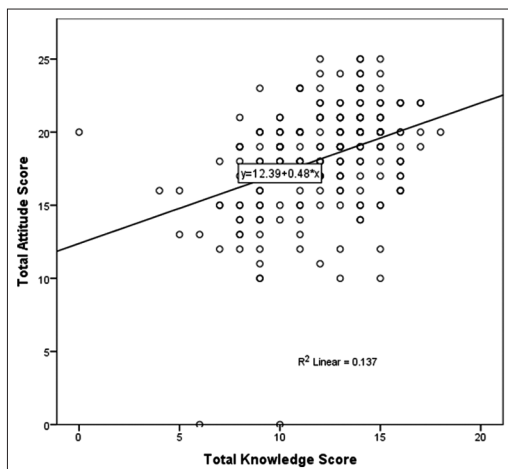


Figure 1: Correlation between knowledge and attitude

Anaesthesiologists with better knowledge of OSA are more confident in managing such patients. This is suggested by the positive correlation between knowledge and attitude score. However, it was interesting to note that more than 50% of respondents in our survey were confident in managing patients with OSA but performed averagely in the treatment domain of the knowledge questionnaire. Efforts like pre- and post-seminar/conference questionnaire would help them understand the situation better.

A similar survey among Italian anaesthesiologists suggested that inclusion of the 'STOP-BANG questionnaire'^[11] in the Operating Room Checklist would improve awareness of anaesthesiologists towards OSA. We agree with this suggestion to improve awareness on OSA among Indian anaesthesiologists. In addition, we suggest the allocation of dedicated hours to training about OSA in the resident's teaching schedule. Teaching modules for trainees and other practicing anaesthesiologists can be introduced in various national-, regional- and local-level academic meetings and pre- and post-teaching questionnaire can help monitor progress.

The limitation of this survey is small sample size as the estimated number of total anaesthesiologists in India is greater than 30,000. However, this survey was conducted in a national conference focussing on difficult airway and was likely to capture practitioners with special interest in difficult airway. We cannot exclude the influence of peers in answering the questionnaire. Also, this is a self-report survey and is subject to systemic bias.

CONCLUSION

Deficit of adequate knowledge about OSA exists among Indian anaesthesiologists. Experience of managing

cases with OSA seems to improve knowledge and attitude towards OSA.

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Conflicts of interest

There are no conflicts of interest.

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APPENDIX

OSAKA questionnaire can be reached at: Schotland HM, Jeffe DB. Development of the obstructive sleep apnea knowledge and attitudes (OSAKA) questionnaire. *Sleep Med* 2003;4:443-50. [https://doi.org/10.1016/S1389-9457\(03\)00073-X](https://doi.org/10.1016/S1389-9457(03)00073-X).