

## Original Research Article

# An assessment of the factors affecting surgical decision making: a multi institutional study

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## ABSTRACT

**Background:** Decision making is a complex process, especially when guidelines are lacking. Surgeons then turn to other factors to help guide them make these decisions. This study is an attempt to understand these factors which play a role in the decision making process of surgeons.

**Methods:** A prospective qualitative study was conducted amongst consultant surgeons and surgical residents from various institutes across Bangalore. The questionnaire was sent out to these surgeons and responses were recorded using Google Forms. A total of 158 responses were received and analyzed.

**Results:** 69.2% of surgeons felt that patient preferences influence their decision making process. Age of the patient and medical comorbidities played a role in the decision making process of 95.5% and 94.2% of the surgeons respectively. 91% of the surgeons agreed that their age and experience has a strong influence on the decisions made by them. The institution of work and availability of tools mattered to 61.7% and 80.1% of the surgeons respectively.

**Conclusions:** Factors such as patients' age, comorbidities, preferences, surgeon's institution of study, institution of work, experience, and institutional factors influence the decisions made by surgeons. Further study is needed on the larger scale to fully understand the various factors playing a role in the final decision making process.

**Keywords:** Decision-making, Factors affecting decisions, Surgeons

## INTRODUCTION

Decision making is a complex process and the subject of research in its own right. It is not formally taught but acquired by practicing doctors, and it is essential that the practice of value based medicine guide the doctor's decisions.<sup>1</sup> The process by which surgeons make decisions has been described as 'the integration of evidence, inference and experience.'<sup>2</sup>

Crebbin et al in their study 'Clinical decision making: how surgeons do it' described the processes of decision making as a continuum, one end of which is a subconscious, automatic type of decision making and the

other end of which has the conscious, analytical, logical deductive approach.<sup>3</sup>

National and international guidelines and class 1 evidence, when available, provide a strong basis for decision making. But controversy arises when the three sources of input, i.e., integration of evidence, inference and experience, are contradictory or when one is lacking, e.g. the absence of rigorous trial data. It is in these situations where the ability to make an accurate decision is most crucial. Under such circumstances, surgeons often turn to other factors to help guide them make these decisions. These include experience, training, expertise, and research involvement, the availability of equipment and tools and financial constraints. Patient preferences

and patient factors also may play a role in the ultimate decision making.<sup>4</sup> Factors such as the anatomy of surgeons' intraoperative decisions, surgeons' physiology, and surgeons' state of the mind are also key elements playing a role in the decision making process.<sup>5</sup>

Despite availability of good working conditions and equipments, continuous appearance of new surgical techniques, procedures and research, there are still gray areas when it comes to deciding the course of treatment of patients, which invites other factors to help determine the individualised surgical treatment options for patients.

Though studies are available comparing the efficacy of one surgical practice over the other, there are few studies which focus on why one particular course of treatment was chosen over the other. This study is an attempt to understand the various factors, apart from class 1 evidence and national and international guidelines, which play a role in the decision making process of surgeons.

## METHODS

This was a prospective qualitative study done from May 2019 to August 2019 at Hospitals and Medical Colleges in Bangalore. 158 surgeon responses were received and analysed.

### Inclusion criteria

Surgeons consenting for participation in the study and consultant surgeons and final year post graduates working in various institutions across Bangalore were included.

### Exclusion criteria

Junior post graduates not involved in the decision making and surgeons not consenting for participation in the study were excluded.

### Statistical analysis

The data collected was tabulated in Microsoft Excel. The data was expressed using descriptive statistics such as percentages, and was depicted using bar graphs.

A prospective qualitative study was conducted amongst surgeons to determine the various factors influencing the decisions made by them. Consultant surgeons and surgical residents from various institutions across Bangalore were included in the study.

After obtaining formal permission from the authors via email, the questionnaire used by Gunaratnam et al in their study was modified and used.<sup>4</sup> The questionnaire consisted of 19 questions, 16 of which were of yes or no type, and 3 were to be answered in short sentences. Of the 16 yes or no type questions regarding the factors influencing the decision making process, 6 were about to

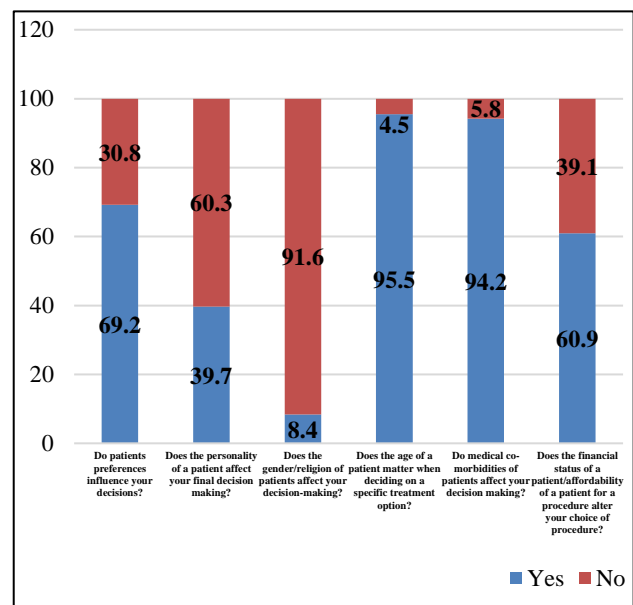
the patient related factors, 5 were about the surgeon related factors, 3 were pertaining to the institution where the surgeons worked and 2 were miscellaneous. The questions to which short answers were expected analysed the surgeon's response to whether innovation of a procedure would affect the decision making, and also had advise of the surgeons to the future generation. The questionnaire was sent out to surgeons from across various institutes via direct handouts, email and social media, and responses were recorded using Google Forms. The responses were anonymous. The respondents were included in the study and the non-respondents were excluded. A total of 158 responses were received and analysed. The data collected was tabulated in Microsoft Excel. The data was expressed using descriptive statistics such as percentages, and was depicted using bar graphs.

## RESULTS

In the study, 158 responses were received and analysed.

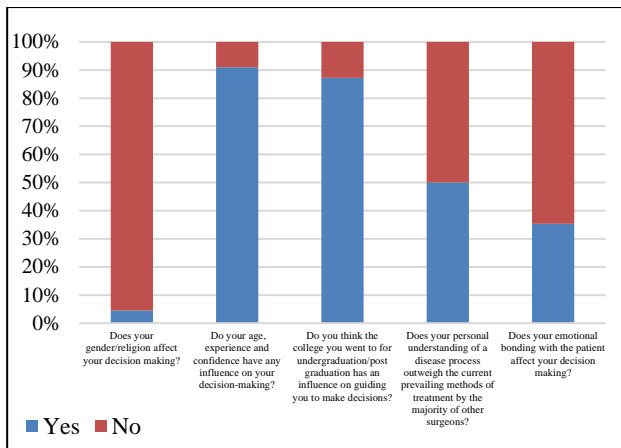
### Analysis of responses pertaining to patient factors

69.2% of surgeons felt that patient preferences influence their decision making process while 30.8% felt it did not affect. 60.3% of them responded that the personality of the patient did not influence their decisions, while 39.7% admitted that it did.



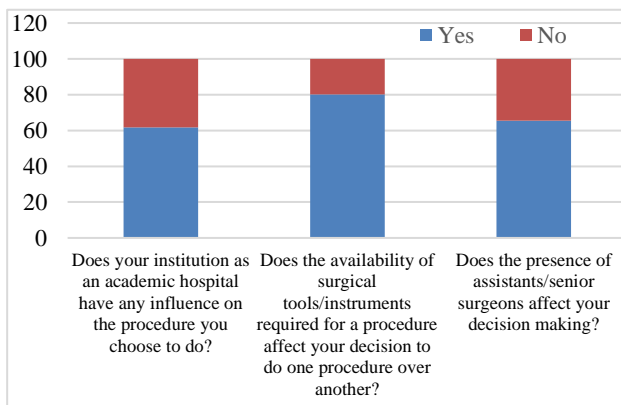
**Figure 1: Analysis of responses pertaining to patient factors.**

95.5% of the surgeons responded that the age of the patient was crucial in the decision making process, and 94.2% responded that medical comorbidities was crucial to the decision making process. Gender and religion of the patient influenced the decision of only 8.4% of the surgeons while 91.6% of the surgeons were not influenced by it (Figure 1).



**Figure 2: Analysis of responses pertaining to surgeon factors.**

91% of the surgeons agreed that their age and experience has a strong influence on the decisions made by them, while 87.2% of them felt that the institution from which they graduated influenced their decisions. The response to whether the personal understanding of the condition of the patient influenced their decisions was equivocal, with 50% responses being yes and 50% being no. Emotional bonding of the surgeons with their patients had a positive influence on the decision making process in only 35.3% of the respondents. Age/gender of the surgeon had the least influence on the decision making process, with positive responses from 4.5% only (Figure 2).



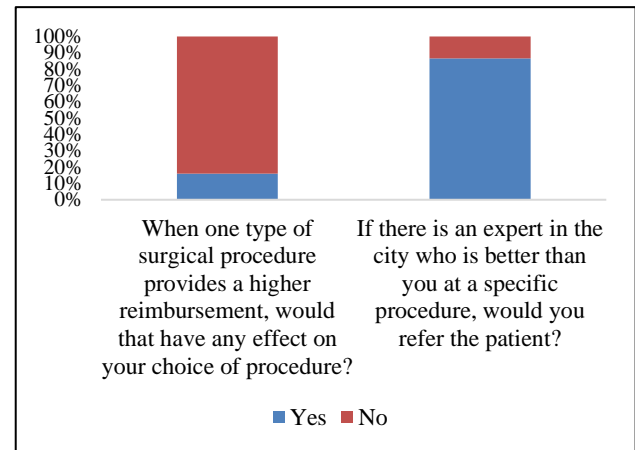
**Figure 3: Analysis of responses pertaining to institutional factors.**

#### *Analysis of responses pertaining to institutional factors*

61.7% of the surgeons accepted that the institution in which they were working influenced their decisions, while 38.3% didn't feel it affected their decisions. Availability of surgical tools and equipments played a major role with 80.1% of respondents accepting that it did affect their decisions. 65.4% of the respondents felt that the presence of assistants/seniors also affected their decisions while 34.6% did not let that be a factor to decide upon the course of action (Figure 3).

#### *Analysis of miscellaneous factors*

86.5% of the surgeons agreed that it was best to refer a patient to an expert, when available. Reimbursements from a procedure did not play a major role in decision making, with a positive response from 16% of the respondents only.



**Figure 4: Analysis of miscellaneous factors.**

The response, in our study, to whether an innovation or ongoing research would alter the decision making, the response was equivocal. Most of the respondents advised the future generations to follow ethical guidelines and seek help when needed.

#### **DISCUSSION**

With the advent of new technology and innovations, the options available for treatment for any condition is varied. The ultimate choice of the treatment option depends on various factors ranging from patient conditions, comorbidities and preferences, to surgeons skills, confidence and institution of work, to miscellaneous factors. Surgeons are faced with situations which require them to make these decisions on a daily basis. Competent surgical decision making is a combination of didactic knowledge, technical skill judgements and the decision making ability of the operator during the procedure.<sup>6</sup> Sayra et al proposed the concept of reconciliation cycle, which constituted the iterative process of gaining and transforming information.<sup>7</sup> They observed that the cyclical nature of a surgeon's decision making implied that a higher degree of awareness was needed for transforming information. The factors governing these decisions, although interesting, is poorly understood. The study was an attempt to understand the same.

Patient factors play an important role in the decision making process. According to the study, most of the surgeons felt that patient preferences influence their decisions, and that age of the patient and medical comorbidities were crucial to the decision making

process. This is consistent with the study by Gunaratnam et al where they found that patient factors, especially age is an important factor in decision-making.<sup>4</sup> These factors can help in predicting the outcomes of the surgery and the possible complications, and hence are crucial to the decision making process. Alexandra emphasized the importance of shared decision making, with the involvement of patients into the decision making process for better outcomes.<sup>8</sup> Santema et al also emphasized on the importance of shared decision making for better patient satisfaction.<sup>9</sup>

This is also consistent with the results by Szatmaey et al in their study 'To operate or not to operate? A multi-method analysis of decision making in emergency surgery' where they found that patient outcome was a major deciding factor for most surgeons.<sup>10</sup> Religion/sex of the patient did not influence the decisions made.

Surgeon factors play a crucial role in the decision making process. In present study it was evident that surgeon's age, experience and institution of graduation influenced the decisions made by them. The study by Caroline Gunaratnam et al revealed similar results, reinforcing the importance of surgeons factors such as level of training, experience and familiarity with the procedure, in the decision making process.<sup>4</sup> These factors reveal the surgeon's personal preferences and comfort levels, and the decisions made will sway towards the zone of comfort and confidence of the surgeons. Szatmary et al reported that novices faced higher degree of uncertainty when compared to experienced surgeons.<sup>10</sup> Niamey P et al found that surgical specialization based on the number of cases performed is associated with less frequent recommendations to operate.<sup>11</sup>

Institutional factors such as the institution of work of the surgeon, availability of equipment, presence of seniors/assistants also influenced the decisions of the surgeons according to the study. These factors influence the confidence of the surgeon and hence the decision making process.

The response in present study, to whether an innovation or ongoing research would alter the decision making, the response was equivocal. Randell et al studied the impact of robotic surgery on decision making. The study revealed both potential benefits and challenges of robotic surgery for decision making, which can have impact on the patient outcomes.<sup>12</sup>

In the study, it was found that financial incentives do not influence the decisions made by surgeons. This is in accordance with the study by Niamey et al who also concluded that financial incentives along with fear of malpractice do not influence the surgical decision making.<sup>11</sup> Most of the respondents advised the future generations to follow ethical guidelines and seek help when needed. The study throws some light at understanding the various factors influencing decision

making. However, this should be conducted on a larger scale for better understanding and validation.

## CONCLUSION

This study was an attempt to understand the various factors which influence the decisions made by surgeons. Factors such as patients age, comorbidities, preferences, surgeon's institution of study, institution of work, experience, and institutional factors influence the decisions made by surgeons. Further study is needed on the larger scale to fully understand the various factors playing a role in the final decision making process.

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