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Non-technical skills amongst multidisciplinary surgeons (notss) in a tertiary hospital in India

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Abstract---Non-technical skills for surgeons are a set of skills that are non-surgical in nature but make the surgical procedure safer for the patient. In this context, this is a study in a tertiary hospital where the non-technical skills of multi-disciplinary surgeons were observed and assessed when they were performing live surgeries. We found that none of our participant surgeons were rated poor for any skills, which endangered performance or potentially endangered patient safety and for which serious remediation would have been required. "Acceptable" standards of "Situational Awareness" and "Leadership" and "Good" standards of "Decision Making" and "Communication & Teamwork", which were the four skills observed.

Keywords---Non-Technical Surgical Skills, Surgery, Patient safety.

Introduction

Good technical skills and manual acuity are unquestionably valuable assets for a surgeon. [1] The non-technical skills of a surgeon also have a great effect on surgery. [2] Surgery requires the surgeon, surgical assistants, and surgical trainees to work in a synchronous manner so that the surgery goes on smoothly without any hurdles. [3] The non-technical skills of a surgeon are critical thinking and interpersonal skills, which enhance the technical skills of a surgeon. [4][5] For a better outcome, every member of the team should be coordinating with each other. [6]

Non-technical skills are frequently underestimated in the field of surgery as compared to the technical skills. To improve the outcome of the surgery, these skills should not be neglected. Situational awareness, decision-making, leadership, and communication are examples of non-technical skills. Studies have

revealed that a significant percentage of errors in surgery are caused by a lack of non-technical skills. [7] The effects of non-technical skills on patient outcomes are poorly understood and poorly managed. [8]

The NOTSS project was developed to evaluate and assess the non-technical skills of surgeons. The NOTSS project is aimed at developing and testing a system for assessing the non-technical skills of a surgeon during an operation. NOTSS has been widely accepted as a tool for the same. Despite the fact that NOTSS Project has not been introduced in India till date, the nearest training and facilitation centre being Kathmandu, Nepal, this study incorporates aspects of NOTSS to observe the general trend of surgeons in our institute regarding non-technical skills.

Objective

To observe and grade non-technical skills of multidisciplinary surgeons of Central Referral Hospital (CRH), a tertiary care teaching hospital in Gangtok, Sikkim, India.

Methodology

Type of study:

Cross Sectional Observational Study

Study area:

Surgeons of all Discipline in CRH major OT with permission from Medical Superintendent of the Hospital

Study population: Surgeons of CRH

Sample size intended: 20 *Actual (Consented 25, Completed 19)*

Inclusion criteria:

All surgeons who had completed their Post-Graduation Training (MS/MD/DNB/MCh) from General Surgery, Neuro-Surgery, Orthopedics, ENT, Ophthalmology, and Gynaecology operating during the study period who agreed to give express consent for evaluation.

Exclusion criteria: Not consenting to be a part of the study

Consent & Ethical Issues:

Approval from the Medical Superintendent of the Hospital was taken in writing after Institutional Ethical Clearance was approved. Consent from the concerned to be observed by surgeons was also taken.

Data collection procedure:

Major OT was visited with appropriate precautions and the surgery and associated peri-procedures were evaluated based on a pre-designed proforma for all aspects of non-technical skills, type of surgery (emergency/routine), and years

of experience of the surgeon post MS. Each primary surgeon was evaluated only once.

Data analysis:

Data were entered in MS Excel and analyzed by IBM Corp. Released 2019. IBM SPSS Statistics for Windows, Version 26.0

Descriptive statistics such as means and standard deviation were calculated. Kruskal Wallis Test was used to generalize the 4 groups here. $P < 0.05$ was considered as statistically significant.

Results & Observation

Total number of surgeons who agreed to participate: 24

The total number of observed surgeons whose data is analysed: 19

A total of 30 surgeons were identified from the hospital, out of which 24 consented to be observed for the study. Due to unforeseen circumstances, we were only able to complete 19 of these observations. Of the non-consenting surgeons, it was noted that the majority of senior obstetrics and gynaecological surgeons refused consent to be observed for NOTSS for this study.

Subject & Qualifications:

The surgeons in our study consisted of 9 general surgeons. 5 Orthopedic surgeons 2 Obstetricians and 1 each of Otolaryngologist, Ophthalmology and Neuro Surgery. 14 of them were Masters in Surgery, the highest qualification, and four were Diplomates of the National Board, and the sole neurosurgeon, a MCh.

Gender Distribution of Participants:

Male: 13 (68.4%) Female: 6 (31.6%)

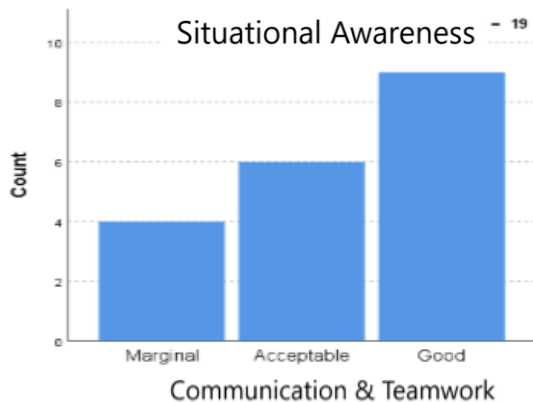
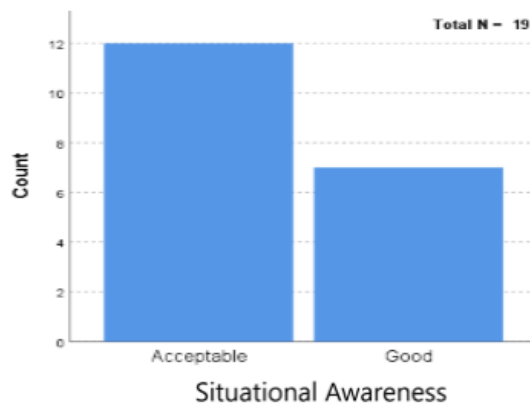
31.6% of the observed participant surgeons were females, and the rest were males.

Parameters (Category) & Element Rating Category Classification

Category	Sub category (Average Rating Taken)
Situational Awareness	a. Gathering Information b. Understanding information c. Projecting and anticipating future state
Decision Making	a. Considering options b. Selecting and communication option c. Implementing and reviewing decisions
Communication & Teamwork	a. Exchanging information b. Establishing a shared understanding c. Coordinating team activities
Leadership	a. Setting and maintaining standards b. Supporting others c. Coping with Pressure

Observations

Category		Rating (No of Participant Surgeons Graded)			
		1. Poor	2. Marginal	3. Acceptable	4. Good
Situational Awareness		0	0	12 (63.2%)	7 (36.8%)
Decision Making		0	2 (10.5%)	5 (26.3%)	10 (63.2%)
Communication & Teamwork		0	4 (21.0%)	6 (31.5%)	9 (47.5%)
Leadership		0	4 (21.0%)	9 (47.5%)	6 (31.5%)
Grading Description					
1	Poor	Performance endangered or potentially endangered patient safety; serious remediation is required.			
2	Marginal	Performance indicated cause for concern; considerable improvement is needed.			
3	Acceptable	Performance was of a satisfactory standard but could be improved.			
4	Good	Performance was of a consistently high standard, enhancing patient safety; it could be used as a positive example.			



In situational awareness, 63.2 % of the participant surgeons were found to be acceptable, whereas the remaining 36.8 % showed performance of a consistently high standard and were rated as good. In decision making, 10.5% is warranted as marginal, warranting considerable improvement, and 26.3% is acceptable, and 63.2% is good. Similarly, in communication and teamwork skills, 21% were observed to have performance that was rated marginal, 31.5% acceptable, but a majority of 47.5% were rated good. In the final category of leadership, a majority of 47.5% were found to be acceptable, 21% marginal, and 31.5% good. None of the participating surgeons were rated poor for any skill. By using Kruskal Wallis test, p value was found to be statistically significant (0.006).

Discussion

NOTSS is a behaviour rating system based on a skills taxonomy. This allows the researcher to have a valid and reliable observation and assessment of four categories of surgeons' non-technical skills: situation awareness, decision making, communication and teamwork, and leadership. These skills are the essential non-surgical (technical) skills a surgeon needs to perform safely in the operating room. ^[4]

In our study, we have seen that with surgeons having postgraduate degrees and corresponding experience over residency, none of them have a rating which can endanger performance or potentially endanger patient safety for which serious remediation would have been required. The majority were seen to have acceptable situational awareness (63.2%), leadership (47.5%), good decision making (62.5%), and communication and teamwork (47.5%).

A larger sample size and repeated assessment would have provided us with more detailed trends in the non-technical skills of the surgeons. Inter rater variability also didn't exist here as in some studies. Unlike many studies, we utilised a live surgery for rating by a single observer and didn't resort to video ratings or simulated surgical setting ratings as seen in some other studies like by JJ Jung et al. ^[3]

Also in the pipeline was a training/sensitization session for the residents as well as the participant surgeons, which couldn't see the light of the day due to the COVID Crisis impending during the period of the study.

Limitation

A larger sample size and an average of multiple assessments may provide more insight.

Funding & Disclaimer

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