

Self-reported comfort with tracheostomy tube care

Cross-sectional survey of non-ear, nose and throat health care professionals

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ABSTRACT

الأهداف: تقييم الراحة الذاتية لغير أخصائي الأنف والأذن والحنجرة في رعاية القصبة الهوائية والتعرف على العوامل المؤثرة.

الطريقة: أجريت دراسته مقطعية على أخصائين غير مختصين بالأنف والأذن والحنجرة خلال الفترة من ديسمبر 2011م إلى فبراير 2013م وذلك في مدينة الأمير سلطان الطبي العسكري و مستشفى الملك فيصل التخصصي ومركز الأبحاث، الرياض، المملكة العربية السعودية، من خلال استبانته جُمع فيها البيانات الخاصة لمستوى الراحة النفسية والسيطرة لدى الأطباء عند إجراء تغيير أنبوب القصبة الهوائية ومن أهم العوامل المؤثرة والتي أجريت عليها الدراسة هي نوع التخصص، مدة التدريب في قسم الأنف والأذن والحنجرة في أثناء الدراسة الجامعية، بالإضافة إلى عدد سنوات الخبرة، والممارسة كاستشاري.

النتائج: بلغ عدد الأخصائين غير المختصين بالأنف والأذن والحنجرة 71 في هذه الدراسة، وكان معدل الاستجابة (100%) وبشكل عام واحد من 4 استشاريين (26.8%) قيموا مستوى الراحة عند تغيير أنبوب القصبة الهوائية بضعف أو متوسط، (38%) جيد في حين (35.2%) ممتاز. كان مستوى الراحة أفضل لدى أطباء التخدير (94.1%) والعناية المركزة (78.9%) وباستخدام تحليل الانحدار، كان الارتياح الأكثر لدى الأطباء الذين كانت لديهم ممارسة في تغيير أنبوب القصبة الهوائية من نظائهم وبدون التعرض النسبة (95%) فترة الثقة 1.90 - 26.40، $p=0.003$ وعند سؤالهم فيما إن كانت دوره إلزاميه في رعاية أنبوب القصبة الهوائية، أجاب (60-72%) بالإيجاب بعض النظر عن اختصاصهم و سنوات الخبرة لديهم.

خاتمة: سجل الأخصائين غير المختصين بالأنف والأذن والحنجرة الممارسين للرعاية التنفسية راحة أقل مع تغيير أنبوب القصبة الهوائية مما يشير إلى الحاجة إلى التدريب لتغطية هذه الثغرة.

Objectives: To assess self-reported comfort of non-ear, nose and throat (ENT) health professionals in tracheostomy care and identify its associated factors.

Methods: This was a cross-sectional survey of non-ENT health care professionals, carried out from December 2011 to February 2013 at the Prince Sultan Military Medical City, and King Faisal Specialist Hospital & Research Centre, Riyadh, Kingdom of Saudi Arabia. A self-administered questionnaire was used to collect data on self-rated comfort levels in performing tracheostomy tube change and factors, such as speciality, duration of dedicated ENT rotation in medical school, and years of experience as a practicing consultant.

Results: A total of 71 non-ENT health professionals participated in the survey. The response rate was 100%. Overall, one out of every 4 participants (26.8%) rated their comfort level in tracheostomy tube change as 'fair or poor', 38% as good, and only 35.2% as excellent. Comfort level was the highest among anesthesiologists (94.1%), and intensivists (78.9%). In the multivariate analysis, physicians who reported ever performing tracheostomy tube change as a resident were significantly more likely to report comfort than their counterparts without such exposure (adjusted odds ratio: 7.09; 95% confidence interval: 1.90-26.40; $p=0.003$). When asked if there should be a mandatory course on tracheostomy care in tertiary care hospitals, most of the participants (60-72%), irrespective of their speciality, training and experience, replied in the affirmative.

Conclusion: Non-ENT health professionals involved in airway care had a low level of self-rated comfort with tracheostomy tube care suggesting the need for periodic refresher training to address this gap.

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Tracheostomy is a commonly performed procedure and apart from otolaryngology, other surgical specialties also perform it routinely.¹ Recently percutaneous tracheostomy techniques have been introduced, enabling non-surgical specialists, such as intensivists to carry out this procedure.² It is a common observation that there is an overdependence of non-Ear, Nose and Throat (ENT) specialists on otolaryngologists to provide post-tracheostomy care including tube change, irrespective of who performs the primary procedure. This not only creates unnecessary burden on otolaryngologists but also results in unnecessary delays in patient care. Therefore, it is important that not only otolaryngologists but also other health care professionals involved in airway care should be familiar with tracheostomy care, including tube change.³ At present, there is a lack of literature regarding how comfortable non-ENT health care professionals are with tracheostomy tube change.⁴ This study attempts to examine this issue in a tertiary care setting in Riyadh, Kingdom of Saudi Arabia (KSA).

Methods. This cross-sectional survey was focused on non-ENT health care professionals working in 2 tertiary care hospitals - Prince Sultan Military Medical City and King Faisal Specialist Hospital & Research Centre, Riyadh, KSA. The selection of the non-ENT health professionals was based on convenience. These included intensivists, anesthesiologists, neurosurgeons, pulmonologists, and emergency room consultants who are routinely involved in tracheostomy tube care. Only consultants or doctors who already had their board certification were made part of study to ensure uniformity in the level of experience. The 2 hospitals where questionnaires were filled are involved in residency training. For a vertical transmission of knowledge and skills, it was thought that knowledge of trainers should be assessed. The study was approved by the Research Ethics Committee of Prince Sultan Military Medical City, and informed consent was taken from all participants. Data were collected from December 2011 to February 2013 using a self-administered questionnaire, which assessed self-rated comfort levels of the participants in performing tracheostomy tube change. Data were

also collected on participant's speciality, duration of dedicated ENT rotation in medical school, and years of experience as a practicing consultant, as well as self-rated need for a refresher workshop on tracheostomy care.

Data was entered using the Statistical Package for Social Sciences (SPSS) for Windows version 19 (IBM SPSS Inc, Chicago, IL, USA). Simple frequencies and proportions were calculated to describe categorical data. Univariate and multivariate binary logistic regression analysis was performed to identify factors associated with self-reported comfort with tracheostomy tube change.

Results. A total of 71 health professionals from different non-ENT specialties were invited to participate in the survey. All agreed to participate. The participants included intensivists (26.8%), anesthesiologists (23.9%), ER specialists (14.1%), surgical specialists (21.1%), and medical specialists (14.1%). Overall, 26.8% participants rated their comfort level in tracheostomy tube change as 'fair or poor', 35.2% as excellent, and another 38% as good (Table 1). Comfort level was high among anesthesiologists (94.1%) followed by intensivists (78.9%), ER specialists (70.0%), surgical specialists (60%), and medical specialists (50%). In the univariate analysis (Table 2) factors associated with comfort at a p value less than 0.2 were high exposure speciality ($p=0.035$), number of years of experience as a consultant ($p=0.068$), ever performed tracheostomy tube change as a resident ($p<0.001$) and duration of dedicated ENT rotation in medical school ($p=0.059$). Of these, only 'ever performed tracheostomy tube change as a resident' was significantly associated with the dependent variable in the multivariate logistic regression analysis (adjusted odds ratio: 7.09; 95% confidence interval (CI): 1.90-26.40; $p=0.003$). When asked if there should be a mandatory course on tracheostomy care in tertiary care hospitals, majority of the participants (60-72%), irrespective of their speciality, training and experience, replied "yes" (Table 3).

Table 1 - Self-rated comfort level of non-ear, nose and throat health care professionals in performing tracheostomy tube change.

Comfort levels	n	(%)
Excellent	25	35.2
Good	27	38.0
Fair	12	16.9
Poor	7	9.9
Total	71	100.0

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Discussion. This study evaluated self-rated comfort of non-ENT health professionals with tracheostomy tube change. We noted a disturbingly low comfort among those with high exposure to tracheostomy management. Some of them had never carried out a tube change during their entire professional career. In residency training, the residents will depend on the knowledge level of their supervising consultants, hence it was meaningful to assess the consultants' comfort in tracheostomy tube care. This was particularly important that the speciality of medical care was relevant and there was good number of patients with tracheostomy in that speciality. In general, the first tracheostomy tube change is performed by the primary physician with subsequent changes carried out by the respiratory therapists or nursing staff.⁵ A simple tube change does not warrant involvement of an otolaryngologist. In the multivariate analysis, physicians who reported ever performing tracheostomy tube change as a resident were significantly more likely to report comfort than their counterparts without such exposure. Although in few medical specialties such as anesthesia, physicians were generally comfortable, still, there were few consultants who had never carried out a tracheostomy tube change being in a very high exposure specialty.

We believe that training in basic life support should include tracheostomy tube essential management to secure the airway and breathing.^{6,7} It is important to mention that similar patient-specific changes have been

made in the basic life support (BLS) course by the American Heart Association concerning defibrillation of patients with permanent cardiac pace makers. The BLS courses should ensure securing airway of normal patients, as well as the airway of patients with tracheostomy. Adequate exposure during residency is important to produce physicians with stronger BLS-related skills, and to produce trainers capable of delivering high quality training. With the guidelines available, non-ENT health care professionals should be able to provide adequate tracheostomy related care, particularly if they are performing the procedure themselves.⁸

A key limitation of this study was the self-reported nature of some of the variables, including self-reported comfort. It could not be ascertained how self-rated

Table 3 - Survey participant's response to the question: Should there be a mandatory course on tracheostomy care for non-ear, nose and throat health care professionals working in tertiary care hospitals?

Speciality groups	n	Response	
		Agree n (%)	Disagree n (%)
High exposure*	46	33 (71.7)	13 (28.3)
Low exposure	25	15 (60.0)	10 (40.0)
All	71	48 (67.6)	23 (32.4)

*High exposure group included intensivists, anesthesiologists, emergency room specialists, cardiothoracic surgeons, and neurosurgeons

Table 2 - Univariate and multivariate binary logistic regression analysis of factors associated with self-rated comfort in performing tracheostomy tube change.

Variables	Crude odds ratio	P-value	Adjusted odds ratio	P-value
<i>High exposure speciality</i>		0.035		0.293
Yes	1.0		1.0	
No	0.29 (0.09, 0.92)		0.47 (0.12, 1.91)	
<i>Years of experience as a consultant</i>		0.068		0.146
<10 years	1.0		1.0	
≥10 years	2.74 (0.93, 8.09)		2.56 (0.72, 9.10)	
<i>Ever performed tracheostomy tube change as a resident</i>		<0.001		0.003
Yes	8.84 (2.64, 29.64)		7.09 (1.90, 26.40)	
No	1.0		1.0	
<i>Duration of dedicated ear, nose and throat health care professional rotations in medical school</i>		0.059		0.099
≤4 weeks	1.0		1.0	
>4 weeks	0.35 (0.12, 1.04)		0.35 (0.10, 1.22)	
<i>Last performed tracheostomy tube change as a consultant</i>		0.002		
<1 year	8.80 (2.07, 37.42)			
≥1 year	12.50 (2.77, 56.33)			
Never	1.0			

comfort was related to the actual practice. A particular strength of this study is its focus on a previously unexplored research area. We provide a foundation on which future research can be built.

In conclusion, a significant proportion of non-ENT health professionals involved in airway care had low self-rated comfort with tracheostomy tube change, which suggests the need for periodic refresher training and more systematic monitoring of this procedure. These gaps must be addressed to maximize patient safety.

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