

Medical Student Presyncope and Syncope in the Operating Room: A Mixed Methods Analysis

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OBJECTIVE: Medical students often feel faint (presyncopal) in the operating room (OR). Despite mandatory surgical rotations in clerkship, there is little formal training and acclimatization to the operating suite in the first 2 years of medical school. This study aimed to assess presyncope and syncope in the OR in first, second, third, and fourth year medical students at a large Canadian academic center.

DESIGN: Following an extensive literature review, we developed a mixed methods survey *de novo* to assess medical students' experience in the OR and determine the frequency of presyncopal and syncopal events.

RESULTS: A total of 180 students (106 females, 59%), evenly distributed among all 4 years of medical school, responded to the survey (response rate 40%, $n = 180/454$). In total, 75 students (42%) had experienced presyncope, and 10 students (6%) had experienced syncope in the OR. Female medical students were more likely to experience both presyncope ($p < 0.001$) and syncope ($p = 0.011$) relative to their male colleagues. They were also more likely to report that these experiences had an effect on their attitude toward the OR ($p < 0.001$) and their career choice ($p < 0.001$). Half of respondents believed that the undergraduate medical preclerkship curriculum did not provide adequate exposure to the OR. Students consistently expressed the desire for more preclinical OR exposure and formal instruction concerning OR etiquette. Only 28% of students reported receiving information on how to avoid syncope, and their classmates were the number one source (59%) for this advice. The most commonly employed preventative measures were eating before the OR and staying well hydrated. Presyncope had a negative effect on attitudes toward the OR in 28% of students.

CONCLUSION: Although true loss of consciousness (syncope) among medical students in the OR is uncommon,

presyncope is a highly prevalent phenomenon. It is most prevalent in female students, and may have a negative effect on overall student well-being. All students may benefit from normalization of this very common experience by staff surgeons or residents. Formal instruction regarding the common symptoms, triggers, and methods for preventing presyncope and syncope is an essential supplement to the current preclinical medical curriculum. (J Surg Ed ■■■■■■■■. © 2016 Association of Program Directors in Surgery. Published by Elsevier Inc. All rights reserved.)

KEY WORDS: syncope, presyncope, operating room, medical student

COMPETENCIES: Practice-Based Learning and Improvement, Interpersonal and Communication Skills

INTRODUCTION

Entering the operating room (OR) for the first time as a medical student may be a daunting and emotional experience, and there is often little or no preparation. Experiences with presyncope and syncope in the OR have previously been reported among medical students. These episodes may contribute to negative feelings such as anxiety, fear, shame, and apprehension, which are common in students entering the OR for the first time.¹ Despite strong interest in surgical careers early in medical training,² there has been a decrease in the number of applicants to surgical programs in recent years.³ Developing an understanding of the contributing factors to this trend is challenging, but include perceptions of lifestyle,⁴ as well as the overall student experience, among others.⁵ Considering the importance of medical students' experience in the OR, and the effect on future career choice,⁵ understanding the role of syncope, and presyncope in this complex process is imperative.

Presyncope and syncope in the OR is often triggered by environmental factors.⁶ A warm environment and prolonged standing are thought to contribute to medical students' experiences of presyncope and syncope.⁷ Other

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contributing factors may include illness, anxiety, insufficient food intake, and fatigue.⁶ Studies examining the prevalence of syncope and presyncope have estimated that 1 in 10 medical students would either faint or feel faint in the OR.⁷ Students are not exclusively susceptible to this phenomenon; however, as veteran surgeons may also experience a similar cluster of symptoms. In a recent survey, 6% of staff surgeons reported experiencing presyncope in the OR.⁸

From anecdotal experiences, we suspect that medical students' syncope and presyncope may even exceed the estimated 1 in 10 students. Despite this, there is very little warning or advice provided to medical students before embarking on their surgical rotations.⁹ This is a likely source of anxiety. In general, anxiety related to OR syncope may have a negative effect on the overall health of medical students, something that is of increasing concern. Furthermore, medical student syncope may also have an effect on patient safety if they are active participants in a procedure. In these instances, the responsibility falls on the surgeon to provide his or her medical student reassurance and guidance for preventing future spells.

Sex may also be an important contributing factor to OR syncope. Female medical students are more likely to suffer from a presyncopal and syncopal event in the OR.⁷ Females are also less likely to choose surgery as a career than their male counterparts.¹⁰ Influencing factors such as lifestyle may contribute to this choice, but previous studies have shown that females may actually be less likely to consider lifestyle than males when choosing a career in surgery.¹¹ Other contributing factors may be important to identify.

The objectives of this present study were to determine the frequency of presyncopal and syncopal events and qualitatively assess medical students' experiences in the OR at a large Canadian academic center. To our knowledge, this is the first study to employ a mixed methods study design aimed at investigating this phenomenon.

MATERIALS AND METHODS

An online survey was distributed via Opinio software (ObjectPlant, Inc., Oslo, Norway) to medical students in all 4 years of study enrolled at Dalhousie University in Nova Scotia, Canada in the 2015/2016 academic year. A cover letter included details about the survey, definitions of presyncope and syncope, informed consent, and eligibility criteria. Approval for this study was obtained through the Dalhousie University Research Ethics Board. A total of 3 survey reminders were provided (See Fig A1).

The mixed method survey was developed *de novo* from an extensive literature review and following discussion with several medical students and staff members. The survey went through a series of revisions by 2 medical students (A.M. and A.H.) and 1 staff surgeon (J.W.), as

well as our research ethics board. The survey consisted of 20 questions, with closed-ended and open-ended short answer questions. Questions assessed medical student's frequency of presyncopal and syncopal events, attitudes, and perceptions of the OR and undergraduate medical curriculum, and preventative measures employed to avoid presyncope and syncope.

Statistical analyses were done in SPSS Version 20.0.0 (IBM SPSS Statistics, 1 New Orchard Road Armonk, New York). Free text responses were itemized and thematically analyzed. The secondary author independently reviewed the free text responses and created content categories, with definitions for each category. The data were coded by these categories and the number of responses in each category was summed. The primary author independently reviewed and validated the coding and content categories.

RESULTS

Demographics

Between December 2015 and February 2016, 180 medical students (106 female, 59%) participated in the survey, resulting in a response rate of 40% ($n = 180/454$). There was an approximately even distribution of students among all 4 years of medical school, with 42 first-year

TABLE 1. Characteristics of Medical Student Presyncope and Syncope in the Operating Room

	n = 180 n (%)
Previous episode of presyncope	75 (42)
Previous episode of syncope	10 (6)
Take preventative measures to avoid presyncope in the OR	79 (44)
Symptoms of presyncope experienced	
Lightheadedness	68 (91)
Feelings of warmth	64 (85)
Sweating	56 (75)
Black spots in vision	32 (43)
Nausea	30 (40)
Anxiety	29 (39)
Blurry vision	20 (27)
Other (urge to sit down, sleepy, and tinnitus)	8 (11)
Which year of medical school the presyncopal episode took place	
Med1	45 (60)
Med2	22 (30)
Med3	30 (40)
Med4	5 (7)
How many presyncopal events were experienced by the individual	
Once	35 (47)
Twice	14 (19)
3-5	19 (25)
≥ 10	5 (7)
Not specified	2 (2)

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