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Clinical study

Behavior and attitudes among European neurosurgeons – An international survey

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ABSTRACT

Background: A recent survey showed that potentially hazardous levels of certain attitudes have been associated with worse patient outcomes in orthopedic surgery, based on a questionnaire that was adopted from aviation. This questionnaire aims to evaluate the prevalence of potentially hazardous levels of machismo, impulsiveness, anxiety, antiauthority, resignation, and invulnerability in attitudes and was adopted for use among neurosurgeons.

Methods: All individual members of the European Association of Neurosurgical Societies (EANS) were invited to fill-out an online questionnaire. Questions were on a five-point Likert-scale ranging from strongly disagree to strongly agree with five questions per attitude and answers were collected together with neurosurgeon and practice characteristics. Participants could score five points for each question after which an overall score was calculated for each attitude. Like the orthopedic survey, a potentially hazardous level of any behavior was defined as a score >20.

Results: Resignation (n = 21; 7.7%) and anxiety (n = 10; 3.7%) had the highest prevalence of potentially hazardous levels among neurosurgeons. Few neurosurgeons showed potentially hazardous levels of anti-authority (n = 4; 1.5%), self-confidence (n = 2; 0.7%), or impulsive attitudes (n = 1; 0.4%). None of the participants showed potentially hazardous levels of machismo. Overall, 12.2% of neurosurgeons had a potentially hazardous score for at least one of the evaluated attitudes.

Conclusion: Findings of this study indicate a low prevalence of potentially hazardous levels of certain attitudes among neurosurgeons based on a questionnaire tailored to neurosurgery. However, the implications of this study are limited by various factors and warrant further evaluation and warrant further evaluation.

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1. Introduction

Neurosurgery requires certain personality traits to provide the best possible outcomes for patients. This stems from the fact that neurosurgery is one of the most complex forms of surgery and therefore demands a high level of skill, precision, confidence, and leadership capabilities. However, certain personalities and associated attitudes may be harmful to patients and could result in inferior outcomes.

The belief that certain personality traits could result in potentially dangerous outcomes was first recognized in aviation, as “Arrogance got more pilots in trouble than faulty equipment” [1]. Furthermore, it was even suggested that over half of the aviation disasters were related to poor pilot decision-making [2]. This has resulted in pilots being trained to use mitigation techniques for specific attitudes, such as machismo, impulsiveness, anxiety, anti-authority, resignation, and invulnerability, to avoid disasters [3–6]. Questionnaires were developed for aviation based on real scenarios to identify potentially hazardous levels of those attitudes [4,6,7].

Similar to pilots, surgeons are highly trained and face challenging, real-time decisions every day, predisposing them to exhibit certain personality traits more frequently than someone in the

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general population [8,9]. The aforementioned questionnaire from aviation was adjusted to study attitudes in orthopedic surgeons and identified that at least 38% of respondents showed at least one form of an attitude that would be considered hazardous in aviation [10]. Furthermore, potentially hazardous attitudes were associated with increased readmissions in orthopedic surgery [11]. These results have far-reaching implications for the quality of surgical care and patient outcomes.

To our knowledge, potentially hazardous attitudes have not yet been evaluated among neurosurgeons. Therefore, the aim of this study was to investigate the prevalence of potentially hazardous levels of certain attitudes among neurosurgeons using a questionnaire adapted from prior studies among orthopedic surgeons.

2. Methods

2.1. Survey development

An adjusted version of Aviation Safety Attitude Scale was used in this study [12]. This scale is validated in aviation and has previously been adjusted to fit the context of orthopedic surgery [3–6,10,13]. This scale includes the six potentially hazardous attitudes: machismo ('I can do it'), impulsiveness ('doing something quickly'), worry/anxiety, resignation/external locus of control ('what is the use'), self-confidence ('it won't happen to me') and anti-authority ('Don't tell me what to do'), and has five questions for each attitude [3–6]. (Table 1). The questions were altered to reflect neurosurgical scenarios. Responses were made on a five-

point Likert scale, ranging from strongly disagree to strongly agree. Additionally, questions on participant characteristics like gender, subspecialty, case-volume, years of experience, size of practice, location, training of residents, and a question about contemporary surgery were added. No data that could lead to possible identification of the participant was collected. The survey was designed to take approximately 15 min to complete and respondents could stop at any moment. The IRB exempted this study from full review.

2.2. Survey distribution

All members of the European Association of Neurosurgical Societies (EANS) were invited by email to participate in this study. The initial invitation was sent out on June 26, 2017, and a reminder was sent out every seven days (3 in total). Final data was collected on July 26, 2017. The EANS does not require approval by a Medical Ethics Review Committee for distribution of a survey among its members.

2.3. Data analysis

Data was analyzed using R 3.3.2 (R Core Team 2017). Nominal variables, including basic respondent demographics, were summarized using counts and percentages. Answers on the five-point Likert scale were treated as continuous by numerical coding (1 for strongly disagree to 5 for strongly agree). An overall score was calculated for each type of attitude for each participant, ranging from a minimum possible score of 5 to a maximum possible score of 25. This score was only created if all five questions related to a specific

Table 1
Hazardous attitudes questionnaire adjusted for neurosurgeons.

Question number	Neurosurgical question	Related Attitude
1	I am a neurosurgeon attributable to entirely my own hard work and ability.	Self-confidence
2	When operating, I worry about not being able to identify land marks and getting lost.	Worry/anxiety
3	If my operation is depending on a specific instrument functioning, I worry about having to complete the operation if that instrument fails.	Worry/anxiety
4	I can learn any surgical skill if I put my mind to it.	Self-confidence
5	I dare to operate on more complicated cases than my colleagues.	Macho
6	I really hate having my cases delayed.	Impulsive
7	I like to prepare for challenging situations by adjusting my routine procedures	Macho
8	I really worry about having to abort a surgical procedure.	Worry/anxiety
9	If the patient's medical condition is questionable, I do not mind waiting for anesthesia to "line-up" the patient.	Impulsive
10	I always worry about technical errors and complications when operating.	Worry/anxiety
11	I am basically an impatient surgeon.	Impulsive
12	I get a kick out of surgeries that make me feel that I saved the day.	Macho
13	The OR administration is more concerned with restricting access to the OR versus providing the services when it needs.	Antiauthority
14	Sometimes I feel that I have very little control over what happens to the patient.	Resignation/external locus of control
15	In a tight situation, I trust fate.	Resignation/external locus of control
16	I really worry about needle stick injuries.	Worry/anxiety
17	Sometimes I feel like the patient's outcome is set before I even start the case.	Resignation/external locus of control
18	If I decide to operate on someone, I want to do it now.	Impulsive
19	The thoroughness of my preoperative plan mostly determines the likelihood of my having a problem during the case.	Self-confidence
20	The OR scheduling desk is more of a hindrance than a help.	Antiauthority
21	When I am in a tough spot, I figure "If I make it, I make it, and if I do not, I do not."	Resignation/external locus of control
22	I like to do challenging approaches.	Macho
23	If you want to protest a license suspension by the state medical licensing authority, the odds are stacked against you.	Impulsive
24	The OR scheduling desk is more of a hindrance than a help.	Antiauthority
25	In surgery, what will be, will be.	Resignation/external locus of control
26	In general, I find the department very helpful.	Antiauthority
27	If I have done something wrong in the OR, I will report it because someone will report me anyway.	Self-confidence
28	A successful surgery is solely the result of good planning and good execution.	Self-confidence
29	Most OR administration rules do not promote safety.	Antiauthority
30	I like to do unusual procedures.	Macho

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