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Orthopaedic Personal Statement Thematic Review: Does Topic Matter?

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Introduction: In the process of applying into medical residency, the Electronic Residency Application Service (ERAS) requires critical documents including a personal statement. Utility of personal statements are questioned based on suspected congruity of the content within personal statements among those who apply into orthopaedic surgery. The goal of this study was to identify and categorize the thematic elements found within the 2021 to 2022 personal statements of orthopaedic surgery applicants at a single institution and assess a correlation to interview invitation.

Methods: Deidentified personal statements among 2021 to 2022 ERAS applicants were reviewed by the research staff and categorized into one of the proposed themes. Three hundred ninty-four applications passed initial screening filters, and 49 applicants were granted an interview. Proposed themes that were collected included: family of physician, working with hands, history of injury/disease, prior professional setting, immigration/travel, athlete/sports, reapplication, previous clinical experience, and other. χ^2 test was used to analyze categorical themes and additional univariate group-to-group comparisons. Multivariate principal component analysis was performed to determine which themes were associated with interview invitation.

Results: There was a significant difference in theme selection for an applicant's personal statement ($\chi^2 = 209.5$, $p < 0.001$), but no statistical difference was observed between each individual categorical themes and interview selection. Univariate group-to-group comparison demonstrated greater interview rates between immigration/travel compared with reapplicant and family of physician compared with working with hands. Multivariate principal component analysis demonstrated immigration/travel as the theme with a positive correlation toward an interview invitation.

Conclusion: Despite a significant focus of the application process into orthopaedic surgery residencies, our single-institution study did observe specific themes that were more prevalent. There was an increased interview rate between applicant's themes for immigration/travel and family of physician when comparing groups. Immigration/travel was also identified as the only significant theme associated with interview invitation which may be due to the recent emphasis on promoting diversity within orthopaedic surgery.

Introduction

Orthopaedic surgery remains one of the most competitive specialties for medical students. The 2021 National Resident Matching Program Charting Outcomes detail the US Doctor of Medicine senior match rate of 64.9% (705 matched, 1,086 applicants) and Doctor of Osteopathic senior match rate of 54.1% (111 matched, 205 applicants)[1]. It becomes even more competitive as previous years' unmatched applicants reapply in

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subsequent match cycles, often with resumes that reflect the extra time available for research or other academic endeavors[2]. As medical students prepare to apply for competitive specialties such as orthopaedic surgery, they undoubtedly look for any part of their application that can set themselves apart from other students, thereby making them more attractive candidates.

In the process of applying into medical residency, there are several documents thought to be critical within the Electronic Residency Application Service (ERAS). The US Medical Licensing Examination (USMLE) Step 1, a standardized test, was viewed by orthopaedic surgery program directors and medical students as the second most important part of the ERAS behind the letter of recommendation[3]. As the USMLE Step 1 numerical grading was removed and became pass/fail on January 26, 2022, the importance of the other components of the application came into question[4]. One of these components is the personal statement, which introduces the applicant to the selection committee and their desire to apply for a specialty and/or to a specific residency program. Most components of the application such as USMLE scores and medical school grades are unmodifiable objective measures; however, the subjective nature of the personal statement is one of the only ways a medical student can alter the application up to the point it is submitted. Still, students may struggle with what constitutes an "interesting" personal statement and how to set it apart from others. Writing a personal statement is a stressor to medical students as this process generally requires multiple cycles of writing, revisions, and seeking editorial commentary from peers and mentors[5]. Despite the perceived importance of the personal statement, its utility to the residency application committees has not been fully elucidated.

Prior studies in other medical specialty fields have noted significant homogeneity within their application pools' personal statements, potentially limiting their usefulness of personal statements[6-8]. This study seeks to identify and categorize the thematic elements found within the 2021 to 2022 personal statements of orthopaedic surgery residency applicants at a single institution. It also analyzes the overall importance of the theme used in the personal statement in obtaining an interview. We hypothesized that there would be limited thematic elements which were categorizable and that there would be no association between any of these themes and an offer to interview. The authors aim to provide a starting point to review the relevance of personal statements for the orthopaedic residency application and potential methods to improve its functionality.

Methods

This study has 2 major components. This is a retrospective analysis of ERAS applications from a single orthopaedic residency program for the 2021 to 2022 cycle that included personal statements written in English. The applications that passed the initial preselected filters on par with other orthopaedic residency programs were then deidentified by removing all personal information, age, and sex. The personal statement was then distributed to the investigators. The personal statements were reviewed for content and categorized by a trend of repetitive theme. The initial analysis of the personal statement by the investigators presented a consistent theme throughout the vast majority of the personal statements. The authors arrived to a consensus of a characteristic theme on the subsequent review of the narratives. A separate list indicating which applications were granted interviews was then compared with the complete list of applications.

The categorization of the personal statement was performed by 2 investigators after reviewing all the personal statements. Prevailing categories after the initial screening were identified as the key theme included family of physician, likes to work with hands, history of injury/disease, prior professional setting, immigration/travel, athlete/sports, not matched previously, and clinical experience/rotation. Prior professional setting included clinical or research experience in the form of a device representative or research within orthopaedics. The immigration/travel theme included a personal history of immigration or international travel experience that they attributed or related their experiences to their application into orthopaedics. Categorization of a personal statement into a specific theme required more than 50% of the narrative to be written of a specific category. Votes were casted with no ties, and categorization was completed for further statistical analysis.

Statistical analysis

Statistical analysis was performed with SPSS statistical software version 28 (IBM, Armonk). Bivariate correlation with the Spearman test or Pearson test was performed to understand the factors correlated with interview and correlation coefficient. *t*-Test or χ^2 with Pearson test was used to determine the different rates between groups. Factor analysis (principal component analysis, rotation method: varimax with Kaiser normalization) was performed to determine which variables were associated with being selected for interview. Statistical significance was defined as a p value smaller than 0.05.

Results

The study included a total of 394 personal statements in consideration for an interview. Of all statements, 3 did not have a clearly identifiable theme. The total counts and percentages for the following categories were history of injury/disease (91, 23.1%), enjoys working with hands (87, 22.08%), prior professional setting (70, 17.77%), reapplicant (50, 12.69%), athlete/sports (48, 12.18%), immigration/travel (26, 6.6%), family of physician (10, 2.54%), clinical experience/rotation (9, 2.28%), and no theme (3, 0.76%). There was a significant difference of theme selection for the applicant's personal statement (nonparametric χ^2 test, $\chi^2 = 363.703$, $p < 0.001$.

Among the total applicant pool, 49 applicants were granted an interview. Of the number of applicants offered an interview, 23.1% of the personal statements' main theme was immigration/travel, 22% clinical experience/rotation, 14.3% athlete/sport, 13.8% enjoyed working with their hands, 12.1% had a history of injury/disease, 10% had a family of physician, 10% discussed experiences in a prior professional setting, and 6% focused on their being reapplicant. None of the 3 personal

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statements that had no identifiable theme received an interview invitation. There was not a significant difference for interview rate between overall statement-group comparison (χ^2 Pearson test, p = 0.530) (Table I).

However, a significant difference was observed upon univariate analysis for 2 group's comparison demonstrating immigration/travel group with significantly higher interview rate compared with the reapplicant group (p = 0.029), and family of physician with a significantly higher interview rate compared with likes to work with hands (p = 0.038) (Fig. 1). Multivariate principal component analysis demonstrated that reapplicants had a decreasing trend for chance of interview invitation. There was a significant correlation between interview rate for interview and immigration/travel, despite no correlation observed with other factors (Table II).

Discussion

Orthopaedic surgery remains a competitive specialty for applying medical students. Despite the paucity of literature regarding the orthopaedic application process, critical reviews of personal statement content and themes have been reviewed within other medical specialties. Max et al. described a similar concern for the utility of personal statements within anesthesiology. Their review of 670 personal statements fell into 13 distinguishable themes, with a majority (60.0%) theme of "love of physiology and/or pharmacology."[9] Similar results have been seen in dermatology residency applications. Lacy et al. reviewed 422 personal statements and found 9 common themes of content. Some themes, however, were more prevalent within matched versus unmatched applicants[6]. This was similarly seen in a study by Olazagasti et al. who found there to be 10 themes within dermatology with similar outcomes[7]. Other smaller studies have attempted to review specialty personal statements, such as emergency medicine (EM). Zhang et al. reviewed 10 personal statements and were able to categorize them into 5 main themes with subcategorization[8]. Two separate reviews within urology and pediatrics showed that writing style displayed gender differences in urology personal

TABLE I Rate of Interview Selection With Each Thematic Personal Statement Topic

	Rate for selected interview*			
	Interviewed			
	No	Yes	p	Spearman Correlation Coefficient
Family are physicians			1.00†	−0.012
No	335 (97.4%)	48 (98.0%)		
Yes	9 (2.6%)	1 (2.0%)		
Likes to work with hands			0.672‡	0.021
No	269 (78.2%)	37 (75.5%)		
Yes	75 (21.8%)	12 (24.5%)		
Hx of injury/disease			0.9‡	−0.006
No	264 (76.7%)	38 (77.6%)		
Yes	80 (23.3%)	11 (22.4%)		
Prior professional setting			0.52‡	−0.032
No	282 (82.0%)	42 (85.7%)		
Yes	62 (18.0%)	7 (14.3%)		
Immigration/travel			0.090‡	0.085
No	324 (94.2%)	43 (87.8%)		
Yes	20 (5.8%)	6 (12.2%)		
Athlete/sports			0.636‡	0.024
No	303 (88.1%)	42 (85.7%)		
Yes	41 (11.9%)	7 (14.3%)		
Did not match			0.172†	−0.075
No	297 (86.3%)	46 (93.9%)		
Yes	47 (13.7%)	3 (6.1%)		
Clinical experience/rotation			0.312†	0.045
No	337 (98.0%)	47 (95.9%)		
Yes	7 (2.0%)	2 (4.1%)		

*Bivariate correlation analysis †Fisher exact test. ‡χ^2 Pearson test.

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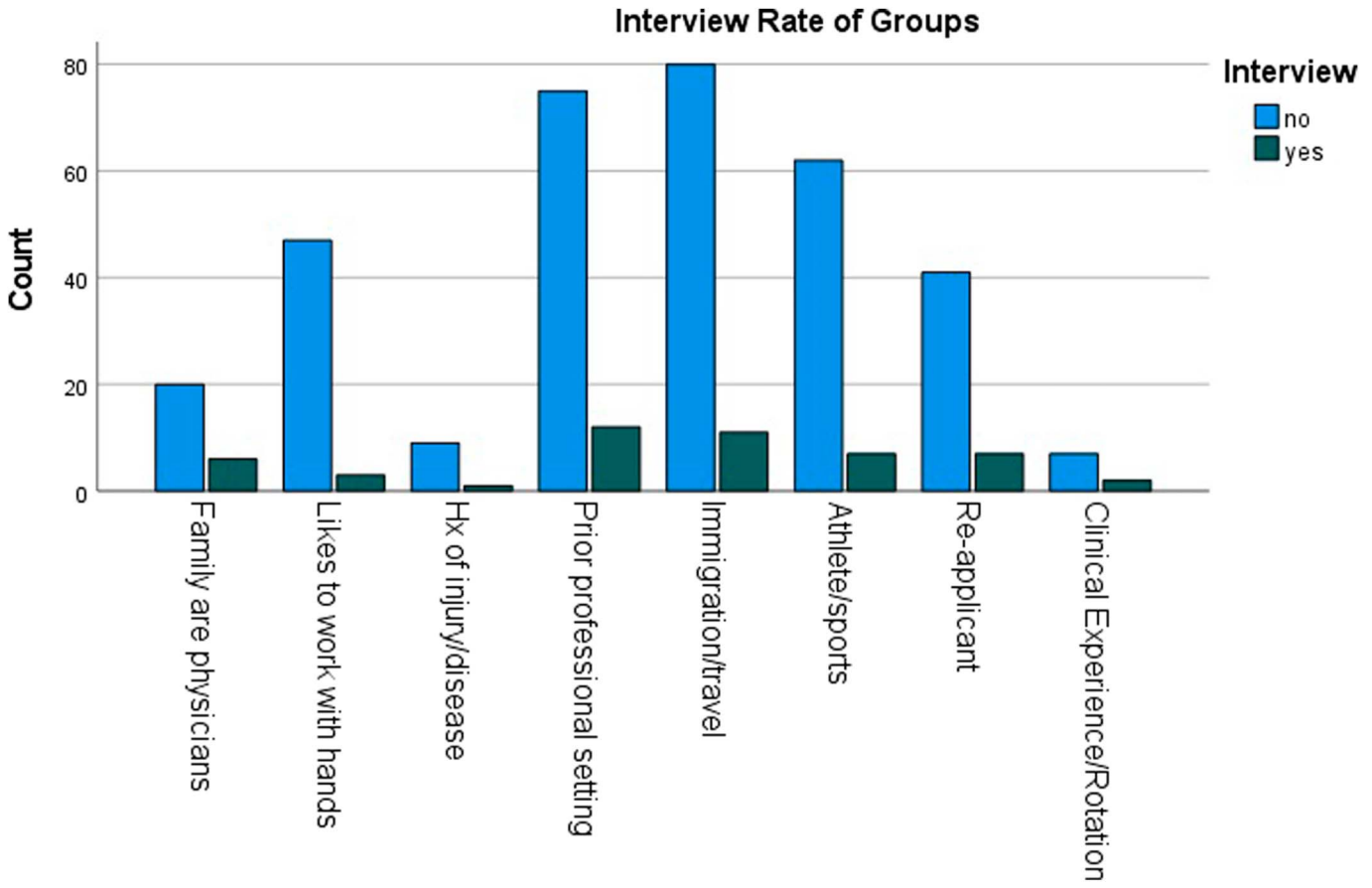

Fig. 1
Interview rates between different themes of personal statements.

statements, but within pediatric personal statements, there was not; however, neither study included a review of thematic elements[10,11].

Within the orthopaedic match, the total applicants in 2015 was 1,062 with a match rate of 66%[12] compared with 2021 total applicants of 1,470 and overall match rate of 59%[1]. There is a projected increase in applicants and subsequent decrease in the successful match rate as unmatched applicants reapply in the following years[2]. This is an area of concern as the USMLE Step 1 will no longer contain a numerical grade[4]. There is an expected reshuffling in priorities of both programs and the candidates' ERAS toward future match cycles. There may be anticipation of an increased number of applicants for orthopaedic surgery programs in the following years due to, in part, the lack of self-selection with a lower Step 1 score and reapplicants from previous unsuccessful matches. Gu et al. studied the anticipated change in importance of different components of the ERAS with Step 1 being pass/fail. They found that 65.8% of program directors stated that Step 1 was rated as very or extremely important before change with a decrease of 34.3% of relative importance after the change. Their study demonstrated that the 5 most important factors will be any failed attempt at USMLE, audition rotation, personal knowledge of the applicant, USMLE Step 2 CK score, and class ranking[13]. Their survey across program directors demonstrates the importance of ERAS components.

TABLE II Principle Component Analysis of Correlation Between Personal Statement Theme and Interview Invitation

Correlation Between Statement Theme and Interview By PCA*	Correlation Coefficient	p†
Family are physicians	−0.012	0.406
Likes to work with hands	0.021	0.336
History of injury/disease	−0.006	0.450
Prior professional setting	−0.032	0.261
Immigration/travel	0.085	**0.045**
Athlete/sports	0.024	0.318
Reapplicant	−0.075	0.070
Clinical experience/rotation	0.045	0.186

*Kaiser-Meyer-Olkin measure of sampling adequacy and Bartlett's test of sphericity, $p < 0.001$. †Significant differences are shown in bold.

Granger et al. surveyed applicants at 2 separate orthopaedic residency programs and demonstrated that applicants believe that the personal statement is valuable and 61% of applicants spent over 15 hours for the writing process[14]. The personal statement is an opportunity for applicants to express their desires for orthopaedics as their chosen specialty and also to highlight any of their own significant personal experiences. A survey between orthopaedic surgery program directors and medical students revealed the importance of personal statements, ranked 11 and 16, respectively, out of 26 aspects of their application[3]. Utility of personal statements are questioned due to the suspected congruity of the content among those who apply into orthopaedic surgery. As would be expected by such a specialized branch of surgery, the breadth of themes in the applicant pool is very narrow. There is also a possibility that medical students could choose a theme based on what they believe the reviewers are looking for. In addition, the personal statement and interview performance were correlated with the applicant's rank list as demonstrated by Legato et al.[12] The value in the personal statement may not be in obtaining an interview invitation, as any interview committee undoubtedly needs to sift through hundreds of applications, but in the person-to-person interview process where the total number of students per institution is much lower. The value assigned to the personal statement varies in the current literature, with increased emphasis for subjective components from the applicant's perspective. There was also an indication in emphasis by program directors for objective measures of performance[12].

In this study, there was a statistical difference observed in the frequency of selected themes for the personal statement with a significant number of applicants' preference to select certain topics: working with hands, history of previous injury/disease, and experience in a prior professional setting. When compared with the current literature, it could explain the relative lack of emphasis on the personal statement due to the homogeneity and frequency of these personal essays. In our institution, it was observed that although there was an increased frequency of certain topics, initial overall analysis showed no statistical correlation between personal statement themes and obtaining an interview. Hasan et al. conducted a survey with program directors to assess the importance of personal statements, which was rated average (2.82/4)[15]. Although the personal statement was used for consideration of the applicant as a whole, it did not contribute much in obtaining an interview or position on the waitlist. In lieu of these initial findings, univariate analysis demonstrated a propensity of interview invites toward immigration/travel compared with the reapplicant group and family of physician compared with likes to work with hands. In addition, multivariate analysis demonstrated that the only significant predictor of interview invitation was immigration/travel. The preference toward immigration/travel may be in part due to the emphasis toward greater representation for under-represented minorities. Approximately 20% of medical students, having a physician parent, may afford disproportionate access to early experiences and shadowing opportunities[16]. Pipeline programs such as the Perry Initiative and Nth Dimensions serve to address this disparity by providing early exposure in orthopaedics and mentorship to promote future success in the match[17]. This may offer some insight into a possible disparity in interview rates, but interview invitations are a multifactorial decision made by the residency committees involved. Another significant observation was that personal statements with no clear theme were not invited for an interview, likely attributed to a lack of narrative or direction. Lack of identifiable theme may be related to writing style and should be carefully assessed by the applicant. Therefore, a suggestion may be for the applicant to direct focus toward an identifiable theme such as immigration/travel or family of physician for potential increases in interview rates.

This study is not without limitations, especially those inherent to retrospective studies. The determination of themes was voted by the judgment of more than 50% of the narrative fitting a theme. While not all personal statements were written based on one theme, the authors acknowledge the presence of multiple themes, but with a pervasive theme, a categorization can be made for further analysis. A potential bias may exist regarding the 3 personal statements with no themes that were not given an interview. The retrospective nature of this study may not be able to identify a possible theme that any of the 3 narratives could be categorized in. Another limitation may exist in the themes "athlete/sport" and "history of injury/disease" as subdividing these cohorts by competition level may be subjective. The spectrum of which the attribution is "competitive" may be subjective to the reviewer and the applicant. In addition, the results of this study were derived from a single institution with 1 year of data. Further trends and possible new themes can be elucidated with multiple institutions and years of data, but this study serves as the first of its kind to elucidate a critical component of the orthopaedic residency application.

These findings question the utility of the personal statement. It is difficult to counsel an applicant on what to write about in the orthopaedic surgery application personal statement. While it is critical to select a theme, there may be further implications to applicants' authenticity of their personal statement if a personal experience is stretched. Applicants are constantly searching for an advantage in a competitive setting, but other factors in the application bear weight. Interview selection can be due to other more objective factors highlighted in the aforementioned study by Gu et al. including USMLE Step 2 CK scores and audition rotation performance[13]. Other factors such as interview performance and interpersonal communication become critical for final rank list determination.

Conclusion

This study demonstrated that there is predilection for orthopaedic surgery residency candidates to write about a narrow range of topics in their personal statements. In addition, most applicants will write about a categorizable theme. However, immigration/travel was demonstrated as the theme likely associated with an interview rate. Direct group-to-group findings suggest a preference of immigration/travel and family

of physician while showing a negative correlation against re-applicant and working with hands. Future studies should aim to address the impact of different components of the orthopaedic surgery residency application. ■

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