A Qualitative Study Exploring Perceptions of Supports, Coping Mechanisms, and Resilience for Unmatched Medical Students

by

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University of Pittsburgh, 2013

Abstract

One of the most traumatic experiences that a medical student can face is going through the National Resident Matching Program (NRMP) process and not matching to any position. Determining the next steps to take is crucial, but many students feel vulnerable and without time and clarity to make these important decisions. At this time, supports are most needed and often lacking. The United States is experiencing a physician shortage, and understanding the significance of underutilizing medical graduates is of high public relevance. The purpose of this qualitative, exploratory study is to solicit the personal narratives of individuals who did not match in the NRMP to gain a deeper understanding of the impacts, challenges, needs, and suggestions related to going unmatched that will inform development of support systems and coping mechanisms for future students who face this experience. We conducted 20 semi-structured qualitative interviews that were all recorded and transcribed verbatim. All transcripts were then coded using an open coding approach by two independent coders. Codes were then examined for relationships, patterns, categories and themes. The two key clusters of domains were the experience of going unmatched and advice regarding supporting unmatched individuals. Among the experience, key take home points were: 1) going unmatched was a psychologically, emotionally, and professionally devastating experience; 2) medical school preparation and responses were limited; and 3) participants emphasized personal mindset and seeking

supports/help as keys to resilience. Among advice, participants had advice for different audiences: 1) to other students/unmatched individuals; 2) to medical schools; and 3) to the overall medical training system.

Table of Contents

List of Tables

List of Figures

Preface

We would like to acknowledge all of the unmatched medical students and doctors who shared their stories with us. We would also like to thank the University of Pittsburgh School of Medicine, and specifically Deans Thompson and Zellers, for providing financial support for our study.

1.0 Introduction

The pathway to becoming a medical doctor is not always linear as many individuals choose various paths to achieve their goal. In the United States, the required steps to become a fully-licensed, practicing physician include college, medical school, and residency training. Residency training is a pre-specified period of time (that varies by specialty and program) where doctors have supervision in hands-on practice and learn their specialty. After residency, physicians are able to take their boards exam and be board-certified in the specialty in which they trained.

1.1 The National Resident Matching Program (NRMP) "The Match."

Although many individuals take a direct path from college through residency, others find their way to medicine through other routes including after spending time in other careers or fields. No matter which pathway taken, all medical students who wish to become practicing physicians have to face the same daunting process of acquiring a residency training spot through the National Resident Matching Program (NRMP) "The Match." Figure 1 illustrates the multiple pathways to becoming a doctor.

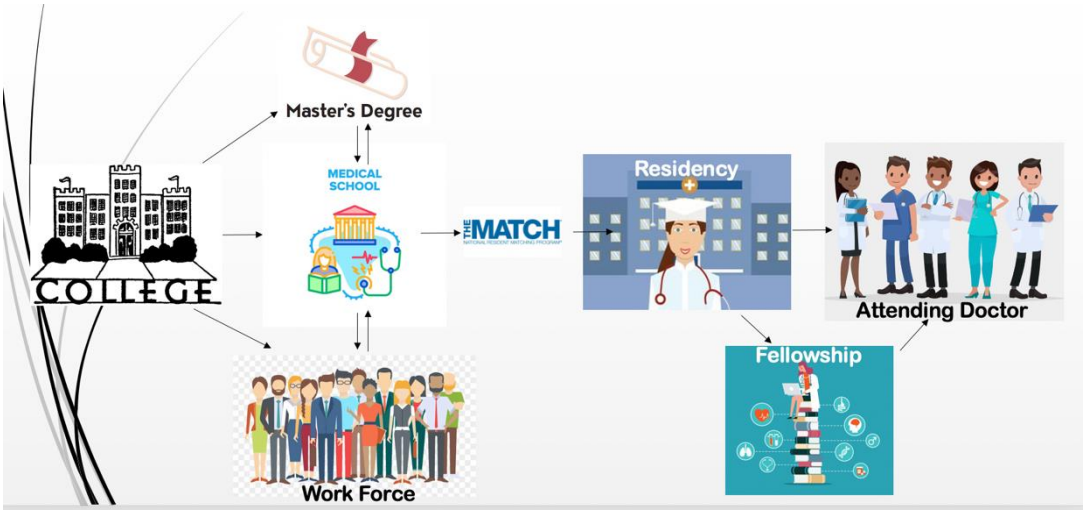

Figure 1: Pathways to Becoming a Doctor

Traditionally, senior medical students apply for a medical residency position. This process begins the summer before graduation, with students creating a curriculum vitae, writing their personal statements, and obtaining letters of recommendations. The application is on a standardized website called the Electronic Residency Application Service (ERAS). All applicants can choose as many programs to apply to as they wish and are able to apply to as many specialties as they would like. On a pre-selected date, all applications are sent to programs at the same time. Program directors and recruitment teams at residency programs receive all the applications on this date. Programs then sort through the applications to choose which applicants they wish to invite for an interview. Programs often receive significantly more applications than residency spots, making it competitive to receive interviews. For example, in psychiatry in 2017, the average number of applications received at each program was 983 with the average number of interview invitations sent at 105. In highly competitive specialties, the average number of interview invitations per application is less than 10%, with the average Dermatology program receiving 449 applications and inviting 38 applicants to interview in 2017 (Resident, 2017).

Applicants typically interview between October through January (Resident, 2017). Afterwards, they make their "rank list," which is a ranked list of all programs where applicants interviewed and would be willing to accept a position (i.e. to legally contract themselves to work at for the length of the residency program). Simultaneously, programs create a ranked list of applicants they interviewed. Both applicants and programs rank each other from their first choice to their last choice, with no requirement to rank every program or applicant that was interviewed. There is a single date, usually a few weeks prior to Match Day, that all medical student rank lists are due. Any list not submitted by that date is not eligible for the Match. The NRMP uses a computer algorithm that matches applicants with programs. Figure 2 illustrates how this algorithm works, showing the rank lists of five students and three programs. The algorithm favors the applicant, with the applicant matching at their top choice program that has them ranked high enough to match. "High enough to match" depends on the decisions made by other applicants, with each applicant filling the spot that is highest on their list. Once a program fills their spots with the applicants they prefer the most, their program is full and all applicants lower down on their list are unable to match at that program. In the illustrative example on figure 2, Charlene did not match to any program and Private hospital did not fill all their spots. Although Charlene ranked City first and Charlene was ranked fairly high on City's list, City program filled with their top two candidates so Charlene did not match at this program. Private chose to not rank Charlene, and the two candidates they ranked matched at other programs. This example illustrates how many qualified candidates do not match even when highly desired by many programs.

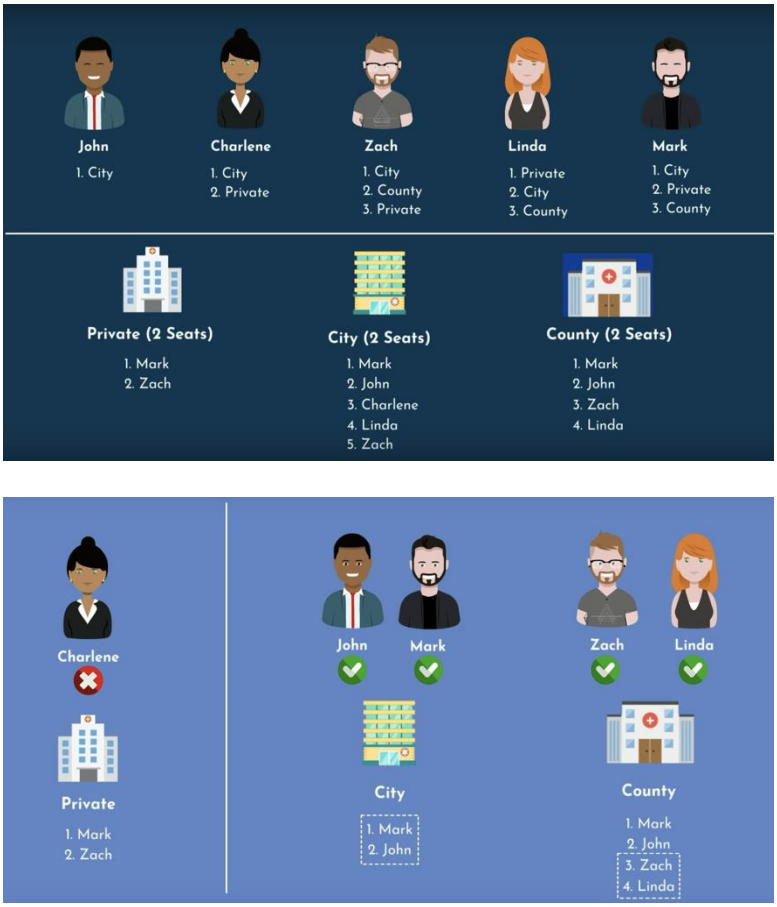

Figure 2: An Illustration of The Match Algorithm

On the Monday of Match week, all applicants receive an email at the same pre-determined time across the country stating if they have matched to any residency position or not. For individuals who go unmatched, they have the option to apply to unfilled programs through the Supplemental Offer and Acceptance Program (SOAP). The SOAP process lasts from Monday through Thursday of Match week, with multiple rounds of acceptances. Unmatched applicants can apply to a set number of unfilled programs in any specialty they choose, and programs can give interviews at any time during the open period. Many highly competitive specialties completely fill their spots or have very few remaining spots, so candidates often apply to specialties other than their preferred specialty.

The process ends on Friday which is called “Match Day.” On Match Day, all applicants across the entire country receive their matched program information at the same time. Matched applicants could match at any of their ranked programs, even in locations that are less desirable or lower on their rank list. Once they match to a program, they are legally obligated to work at the program where they matched. In 2021, 46.4% of matched U.S. medical doctor (MD) seniors and 42.4% of matched U.S. doctors of osteopathic medicine (DO) seniors matched to their first-choice program respectively (National Resident Match Program, 2021). Overall, there has been a trend for fewer U.S. MD and U.S. DO students to match to their first choice program, as these proportions represent a drop from the 60% of U.S. seniors who matched to their first choice in the late 1990s (National Resident Match Program, 2021).

In 2021, 48,7000 applicants registered for the Match, and there were 42,508 active applicants competing for 35,194 first-year residency position (PGY-1) and 2,912 second-year residency positions (PGY-2) (National Resident Match Program, 2021). The overall PGY-1 match rate was 78.5%, with 92.8% for U.S. MD seniors, 48.2% for U.S. MD graduates, 89.1% for U.S. DO seniors, 44.3% for U.S. DO graduates, 59.5% for U.S. students/graduates of international medical schools, and 54.8% for non-U.S. citizen students/graduates of international medical schools (National Resident Match Program, 2021). These figures may be artificially elevated for international medical students/graduates because they only take applicants who received at least one interview and ranked at least one position through their platform into consideration, and many international medical graduates do not receive even one residency interview (The New York Times, 2021). The unmatched students/graduates would either need to apply to the unfilled

positions, wait another year to reapply to residency, or decide on another career path (The New York Times, 2021).

One challenge in increasing the residency positions may be related to the funding structure for these positions. The Medicare program is the largest public source of funding for residency positions, and the U.S. Congress imposed a cap on this federal support in 1997, restricting the finance to levels from 1996 (Boyle, 2020; University of California Health, 2020). This is considered the main driver for the insufficient number of residency spots in the country (Boyle, 2020).

1.2 Public Health Relevance

An increasing physician shortage is a major public health issue in the United States, with the American Medical Association (AMA) predicting that there will be a physician shortage between 54,100-139,000 physicians by 2033. From 2015 to 2030, the US population aged 65 years and older is predicted to increase by 55%, and one-third of practicing physicians will also be 65 years or older in this time frame (Kirch & Petelle, 2017). The aging demographics of the United States will lead to increased need for medical providers, and many medical providers will be retiring as they are also aging. Without enough physicians, individuals seeking healthcare will face more barriers and have less access to specialized physicians (Kirch & Petelle, 2017). The most obvious answer to solve this problem is to train more physicians, highlighting the juxtaposition of the increased need for licensed physicians yet increasing number of unmatched medical students.

In order to address this physician shortage, there have been an increasing number of medical school positions created across the country and therefore more applicants to the Match (National Resident Match Program, 2021). Additionally, many individuals from both the United States and other countries attend medical schools in the Caribbean or other international medical schools with the intention to practice in the United States when they are finished with their training. Although the number of residency positions have also been increasing, this increase has not been proportional to the increase in candidate and not enough to prevent the significant number of individuals from going unmatched every year (National Resident Match Program, 2021). Despite there being more qualified individuals studying medicine and wanting to address the ever-growing physician shortage, there are not enough training options available. There are at least 10,000 chronically unmatched medical doctors in the United States, both from American and international medical schools. These individuals reapply year after year hoping to secure a residency position (The New York Times, 2021). The number of residency positions has not increased quick enough to provide residency positions for these chronically unmatched medical graduates (The New York Times, 2021). Given the public health need for more licensed physicians in the country, addressing the high number of graduated doctors who do not have a pathway to becoming a licensed physician would be beneficial to addressing this public health issue.

1.3 Impact of Not Matching

1.3.1 Student Mental Health

One of the most traumatic experiences that a medical student can face is going through the Match process and not matching to any residency training position. Determining the next steps to take is crucial, but many students feel vulnerable and without time and clarity to make these important decisions. Between 23-31% of individuals exposed to a trauma develop mental health disorders within 12 months after a trauma (Price, van Stolk-Cooke, Brier, & Legrand, 2018). At this crucial and often traumatic time, supports are most needed and yet are lacking.

1.3.2 Financial Burden

Substantial burdens and hurdles exist for individuals pursuing a medical education. The average debt of a medical student upon graduation was $201,490 in 2019. Additionally, applying to residency also has its own costs. When taking into consideration only applying to one specialty, including USMLE transcripts, the cost to applying to residency increases substantially when applying to additional programs. For example, applying to 20 programs cost $339, 50 programs cost $1,059, 100 programs cost $2,359, and 200 programs cost $4,959 (https://store.aamc.org/downloadable/download/sample/sample_id/296/). Many individuals applying for the second time, subsequently referred to as reapplicants, are recommended and do apply to over 200 programs, which presents a significant burden.

1.3.3 Stigma

Link and Phelan defined stigma as "the co-occurrence of its components–labeling, stereotyping, separation, status loss, and discrimination–and further indicate that for stigmatization to occur, power must be exercised" (Link & Phelan, 2001). Stigma related to being an unmatched medical student is widely recognized by individuals who have previously went unmatched (Nallani, 2020; Vogel, 2018). This can manifest as decreases in interviews for reapplicants, attributing blame on individuals for not matching (rather than on the system that allows medical students to be unmatched), and loss of power over future career choices. Although it is well-recognized among individuals who have went unmatched, there are no studies exploring this stigma, the traumatic impact of this stigma, or what unmatched students describe they need to better cope and develop resilience to this experience.

1.4 Medical Student, Health Provider, and Physician Resilience

Resilience in the medical community has been a recent focus given the high rates of burnout in medicine (O'Dowd et al., 2018). Resilience protects against stress, both physiological and psychological (O'Dowd et al., 2018). It also promotes better mental health outcomes.(Martinez & Opalinski, 2019) Other work has suggested that medical students may have lower resilience than the general population (Houpy, Lee, Woodruff, & Pincavage, 2017). Resilience in medical students is associated with wellness and wellbeing, giving students abilities to overcome challenges (Eley & Stallman, 2014). However, resiliency is personal to each individual and can be defined various ways. A qualitative study in Ireland asked physicians to

define resilience, with many participants considering resilience to be coping more than thriving during adversity (O'Dowd et al., 2018). Understanding the concept of resilience is key to beginning the pathway to finding resiliency.

The path to resilience is individualized, with medical students sharing varying life experiences prior to medical school sets a different standard of starting resilience for many students (Farquhar, Kamei, & Vidyarthi, 2018). Experiences have been noted to increase resiliency, including a sense of purpose such as the purpose that can be found through patient contact and accepting failures as part of the medical training process (Farquhar et al., 2018). Difficult events in clinical setting and poor team dynamics have been shown to be highly stressful for medical students, and medical students would like to have team-based discussions about these events after they occur (Houpy et al., 2017). Additionally, many medical students believe receiving training on resiliency would be beneficial for their own personal path to gaining resiliency (Houpy et al., 2017).

System-level interventions targeting resilience is lacking medicine (O'Dowd et al., 2018). These include workload, staffing, and lack of resources (O'Dowd et al., 2018). Resilience both at the individual-level but at the health system level may be effective to promote an adaptive healthcare system (Barasa, Cloete, & Gilson, 2017). Individuals need to first identity their stress response before understanding their adaptive or maladaptive responses to this stress (Epstein & Krasner, 2013). In the business of medicine, many individuals fail to acknowledge the early signs of stress including fatigue and irritability (Epstein & Krasner, 2013). To help students, faculty members acknowledging their own personal experiences with stress and resilience could be helpful

in normalizing this stress in medical students (Farquhar et al., 2018). Faculty members disclosing stress and resiliency experiences and increasing communication and structured activities about managing stress could be helpful (Farquhar et al., 2018). Additionally, increasing institution-wide social support through individual and group settings that are both structured an open-doored has been considered potentially helpful (Farquhar et al., 2018).

The public view of a physician may also impact physician wellness (Epstein & Krasner, 2013). Although the public generally wants physicians who handle stress well, attentive, caring, well-rested, and connected to their patients, they may also see physicians as privileged and be unsympathetic to the stresses of medicine (Epstein & Krasner, 2013). Physicians who can care for themselves work better than those who do not, and there has been calls for medical institutions to promote resiliency for physicians in the workplace (Epstein & Krasner, 2013).

1.5 Justification for Current Study

There is currently a paucity of literature on the unmatched medical students and doctors. Most studies have explored various characteristics of unmatched medical students including USMLE/COMLEX scores, rotation grades, volunteer experiences, and research experiences (citations). However, we are not aware of any prior study that explored the students' perception of their unmatched experience and their suggestions and insights regarding how medical schools and the NMRP can better assist unmatched students in coping with and rising from this experience. The purpose of this research study is to first learn about student's personal narratives and potential traumas experienced from going unmatched. The study also aimed to learn more about students'

recollection of how medical schools provide supports to students who do not match and what supports they wished had been provided. We were interested in learning about both positive and potentially harmful coping mechanisms that medical students who do not match used after not matching. Finally, we would like to have a better understanding of how students who do not match build resilience after experiencing this event. The purpose of this qualitative, exploratory study is to solicit the personal narratives of these individuals to use them as a framework of the support systems and coping mechanisms needed to overcome this obstacle.

2.0 Methods

2.1 Study Design

This study is a qualitative study using individual semi-structured interviews. In this study, semi-structured qualitative interviews were conducted via telephone or zoom. We choose a qualitative approach because we wanted to learn about the experiences of unmatched medical students, their feelings, concerns, needs, and ideas through their perspectives and their own words (Giacomini, Cook, Group, & Group, 2000; Patton, 2014). There is little research currently on unmatched medical students, so our research study wanted to first understand the experiences of unmatched medical students/graduates and let them share their stories. We chose qualitative interviews (versus focus groups or other approaches) to focus on each individual's story in an in-depth manner. We also wished to reduce discomfort and impact from feelings of stigma and shame and thus wished to protect individual's anonymity through individual interviews. With this approach, we were able to capture both novel information that would have been lost with a more structured interview along with the thoughts, feelings, and beliefs about the process that only individual qualitative interviews give space and safety to express.

Study team members met to discuss goals of the project. By consensus, we agreed that our long-term goals would be to: 1) understand systemic barriers facing unmatched medical doctors and students; 2) develop better protocols for medical school to use to provide supports for future unmatched students; 3) identify strategies to reduce stigma associated with not matching; and 4) help future unmatched medical students learn about coping and resilience after experiencing not

matching through the NRMP. Thus, we determined that our study objectives would be: 1) to understand the experiences of students and doctors who did not match through the NRMP; 2) to describe the advice and suggestions of the unmatched students and doctors; 3) to assess the perceived supports available at the medical school for those who do not match; 4) to understand what medical school resources unmatched individuals found most useful/not useful tools; 5) to assess unmatched students' perception of the quality of support for the SOAP/Scramble process; 6) to identify what unmatched students described were effective/ineffective coping mechanisms when going unmatched; and 7) to solicit unmatched students' opinions on how to make systemic changes that would address the issue of medical students/graduates going unmatched.

With these study objectives in mind, the team created an interview guide. The interview guide covered major topics such as a general overview of the story of going unmatched for each applicant, the medical school response, coping strategies used after not matching, supports available and utilized, advice for reapplicants, any systemic changes desired to make the process better, and any ending remarks that each participant wanted to share. Two study team members collectively created the interview guide, practicing the questions to ensure that the interview guide remained as open-ended as possible. Afterwards, the interview guide was shared with the overseeing faculty member with the intention to create an interview guide as open-ended and story-telling as possible. The interview guide is included in the appendix.

This study was approved by the University of Pittsburgh (approval number STUDY20060075) and. funded through the University of Pittsburgh School of Medicine and conducted in partnership with the School of Medicine and Graduate School of Public Health.

2.2 Participant Recruitment

The study recruited medical professionals or students who did not match through the NRMP or equivalent subspecialty match cycle (e.g. urology, ophthalmology, or other subspecialty match) in the United States. Participants were included regardless of citizenship status, year of graduation, year of match cycle, location of medical institution, or type of medical school. Participants were not included if they were under 18 years old or non-English speaking.

Participants were recruited by various methods. The first method was by word of mouth and the snowball sampling. Individuals known by any of the team members to have previously gone through the NRMP and went unmatched were individually contacted from researchers and medical school administrators informing them of the study. We also used snowball sampling approach by inviting all participants to pass along study information to anyone else they knew who had experienced being unmatched and who they felt would be interested in participating in the study.

Participants were also recruited using recruitment flyers on Reddit pages meant for medical school and residency advice. Study team members did not communicate with potential subjects via social media; the recruitment flyer had emails of study team members, and potential participants emailed us stating their interest in the study. A recruitment flyer was also posted on the unmatchedmd.com. This website is specifically created to present information for individuals who went unmatched. Interested individuals were instructed to email study members with their interest in participating in the study. Additional information regarding the study was provided and those who indicated a willingness to schedule an interview and participate in the study received a

link to a password-protected Zoom video call. The password was included as an extra layer of security to protect their privacy.

Participant enrollment and conduction of interviews was continued until the study had reached thematic saturation, defined by Patton as "the point at which no new concepts emerge from subsequent interviews" (Patton, 2002; Vasileiou, Barnett, Thorpe, & Young, 2018). In total, 20 interviews were conducted until thematic saturation was achieved.

2.3 Data Collection

2.3.1 Demographics

A 10-question questionnaire was created to collect basic demographics of participants. This included age, gender, race, ethnicity, field of medicine, region of location of medical school, years since applied to the match, times went through the match, and current employment. The questionnaire was sent to participants through email as a link to the REDCap server where the survey was located. Participants were encouraged to only fill out the survey if they felt comfortable, and no identifiers were collected that could connect the questionnaire with the participant's interview. Participants were also not required to complete the questionnaire to be a part of the study.

2.3.2 Interview

Interviews were recorded using Zoom recording and transcription software. In order to ensure informed consent for participation in the study, participants were read an introductory script stating the purpose of the study, the contents of the interview, possibility to withdrawal from the study at any point, risks and benefits, and contact information for more information. After reading the script, all participants were given as much time as they needed to decide if they still were interested in participating in the study. All potential participants remained interested in participating after reading the introductory script, and they verbally consented to continuing with the study.

Investigators conducting interviews were trained in qualitative interviewing. This training included performing and reviewing several practice interviews to ensure that the conversations would be open and participant-directed and led. A link can be found in the appendix to the interview guide previously mentioned and used during training sessions to ensure training was completed effectively.

The interviews lasted on average between 30-90 minutes. Participants were invited to share any information or stories relating to their unmatched experience. Using the interview guide to help direct and focus the conversation, investigators conducted all interviews. The guide was used as a tool to focus the interview on the primary research topics of interest and were adapted based on the direction and experiences of each participant. Probing questions were used to elicit clarification or more details for each thematic question. After participation in the study,

participants were compensated with a 20-dollar Amazon gift card emailed to them to show gratitude for their participation in the study.

After the interview, recorded files were downloaded to password protected computers and then transferred to the secure University of Pittsburgh Box account. Any names or identifying information mentioned by the participant during the interview were edited out of the transcript. Information from the demographic questionnaires was uploaded into an unlinked datafile.

Transcriptions of the interviews were automatically created using the Zoom software. In a few cases, Zoom transcriptions were not automatically sent as expected from the program. For these recordings and for the final half of the recordings, 10 in total, professional transcriptionists were hired to perform the transcription. Study team members checked the other 10 transcriptions for accuracy and quality assurance.

2.4 Data Analysis

Descriptive statistics were completed on the demographic questionnaires. Frequency tables were completed to present the demographics, general location of medical schools, types of medical schools, and intended medical specialties for a more complete picture of the participants included in analysis.

We analyzed the interview transcriptions using an open qualitative coding approach building a code book in an editing fashion (Crabtree & Miller, 1992). We did not implement an

already existing coding template. This decision was based on lack of prior work in this area to guide a coding framework and a desire to focus on what emerged from the interviews rather than imposing any predetermined investigator ideas and perceptions, which is a coding technique used in other qualitative studies (Glaser & Strauss, 2017). Coding was performed independently by two coders--the principal investigator as well as one co-investigator--both who are trained in qualitative analyses. Coders met to compare codes to discuss interpretations of the text. While coding each additional transcript, we added, edited, expanded, and condensed the codebook in an iterative fashion. After noting no new codes were being added to the codebook, we finalized the codebook and applied this coding scheme to all transcripts While coding transcripts, we reviewed codes to identify emerging patterns, categories, themes and subthemes. All patterns, categories, themes and subthemes were explored in more depth at the completion of the coding.

3.0 Results

3.1 Participant Characteristics

A total of 20 individuals participated in the study. Of the 20 individuals who completed a semi-structured interview, 19 completed the demographics questionnaire. Table 1 presents participant characteristics. The average age of the participants were 35.4 ± 7.6 years with 68.4% of participants identifying as male and 31.6% identifying as female. In terms of race, 47.4% were Asian, 5.3% were black, 47.4% were white, and 10.5% identified also as other. 1 (5.3%) participant was of Hispanic or Latino or Spanish origin.

On average, participants had applied to the Match for the first time 4.4 ± 3.6 years ago and applied 3.8 ± 2.9 times to the match. There were varying specialties that participants had applied to including family medicine (16.7%), psychiatry (16.7%), internal medicine (11.1%), pediatrics (5.6%), radiology (5.6%), or other/prefer not to respond (44.4%). Slightly over half of participants studied medicine outside of the United States (52.6%), with the remaining participants studying in the Mid-Atlantic (15.8%), the South (15.8%), the Mid-West (10.5%), or New England (5.3%). Employed varied with 7 (36.8%) working outside of medicine, 4 (21.1%) working as a resident physician, 2 (10.5%) working in medicine with an alternative license, 1 (5.3%) practicing as a physician, 1 (5.3%) studying, and 3 (15.8%) unemployed.

Table 1: Participant Characteristics

Characteristic	**N = 19**
Age (years)	35.4 ± 7.6
Sex	
Male	13 (68.4%)
Female	6 (31.6%)
Race	
Asian	9 (47.4%)
Black or African American	1 (5.3%)
White	9 (47.4%)
Other	2 (10.5%)
Ethnicity	
Hispanic or Latino	1 (5.3%)
Not-Hispanic or Latino	18 (94.7%)
Specialty	
Family Medicine	3 (16.7%)
Internal Medicine	2 (11.1%)
Psychiatry	3 (16.7%)
Pediatrics	1 (5.6%)
Radiology	1 (5.6%)
Other or Prefer not to Respond	8 (44.4%)
Medical School Region	
New England	1 (5.3%)
Mid-Atlantic	3 (15.8%)
The South	3 (15.8%)
Mid-West	2 (10.5%)
Outside of the United States	10 (52.6%)
Years Since First Applied to the Match	4.4 ± 3.6
How Many Times Applied to the Match	3.8 ± 2.9

Current Position	
Resident Physician	4 (21.1%)
Alternative Licensing in Medicine	2 (10.5%)
Practicing Physician	1 (5.3%)
Outside of Medicine	7 (36.8%)
Student	1 (5.3%)
Unemployed	3 (15.8%)

3.2 Themes

The two key clusters of domains seemed to be the experience of going unmatched and advice regarding supporting unmatched individuals. Among the experience, key take home points were: 1) going unmatched was a psychologically, emotionally, and professionally devastating experience; 2) medical school preparation and responses were limited; and 3) participants emphasized personal mindset and seeking supports/help as keys to resilience. Among advice, participants had advice for different audiences: 1) to other students/unmatched individuals; 2) to medical schools; and 3) to the overall medical training system. The following sections will split the key clusters by experience and advice, using the previous take home points to organize the results. The process of not matching and reapplying is personal, and themes were also noted to differ based on whether or not the participant's medical school was in the United States and the participant's citizenship.

3.2.1 The Experience of Being Unmatched

The first theme that emerged from the study was about the experience of being unmatched. This experience varied for each participant, and the major subthemes will be discussed below.

3.2.1.1 Not matching into a medical residency was a devastating experience

The narratives and traumas associated with going unmatched followed various trajectories, including devastation defined as severe shock or grief. Many described this experience as an unexpected shock. One participant said, “in my entire life, I never had even considered the possibility of after getting through Medical School that I would have been having an issue getting a job." Participants described how the experience caused negative emotional and psychological consequences. These included a psychological impact ranging from depression to suicidality. Some participants felt disassociated from their bodies, resulting in decisions incongruent from their baseline personalities. This is illustrated in the reflection of this participant: “I think part of the reason I could do it is, it's just like I was hardly feeling anything so I wasn't feeling embarrassment or apprehension. I was just numb….” Another participant described how this dissociation led to risky driving behavior: “So at one point, I was so disassociated with myself that it just felt like I was floating above myself and watching myself from above…At one point I was driving home on the highway and I didn't even know I was driving. It felt like I was disassociated again.” Others described feeling depressed and hopeless. This led to some leaving medicine altogether: “Some of them, they just gave up. Totally gave up. They didn't even apply anymore after the first three years. You know they stopped applying because of the funds. They don't have the money to apply.” Some participants described feeling suicidal: “…there were moments that, if I want to mention, that I really

wanted to kill myself, which I have actually shared the first time with anyone. I didn't have a plan… being a doctor, I have diagnosed people with the SIGECAPS and depression, and I knew I was totally depressed. I do not take any medications. I thought… this is not me."

3.2.1.2 Stigma

Participants spoke about stigma related to going unmatched. As one participant described, "The unmatched as being the 'great unwashed' of the medical community, and part of that is because there's so little recognition in the medical community." Others described how being unmatched caused them to doubt themselves and wonder what about them was defective or problematic: "Because there's also a big part of me that, like, well, what else was at play? Like, is there some terrible part of me? Is there some black or some red flag that I don't know about myself?" Participants described how friends, family members, fellow students, or faculty treated and viewed them differently. As one participant explained, "You know, they feel, oh, if you're unmatched, something's wrong. You're defective…" Another participant echoed this and described how this impacted interactions with other students and faculty: "If you're one of the handful who don't match, as soon as you tell anyone, faculty or student, that you didn't match, they have no idea how to talk to you. It's like telling them that you have a dreaded disease or that your parents, you know, just died or something." Participants also spoke about the frustration of constantly needing to explain why they went unmatched during subsequent application cycles, even when they did not feel as though they had a true explanation of what happened.

3.2.1.3 Medical schools' preparation of and support for unmatched students was limited

Participants described getting varying levels of support from their medical institutions. A few described feelings of support by their faculty as in this participant's reflection of the support received during the SOAP process: "We were given a list of programs that still have open slots. We were given assistance in addressing our personal statements. Those needed to be changed since obviously at this point, you're applying to a lot of things that maybe were specialties you never planned to apply to, so there were multiple faculty members heavily engaged in that."

Most, however, shared having limited academic support and often no emotional or psychological support during the process. Some recalled that their school administration seemed more focused on the institution's reputation and standing than the wellbeing of them as the unmatched individuals: "Their whole administrative situation is that they're just embarrassed that they have anyone that doesn't match, and that kind of embarrassment, I think, really precludes them from taking any real action to do anything to help those who don't match." Another participant recalled how a faculty mentor seemed to focus more on his own reaction to having an unmatched mentee than that mentee's needs: "You know the perspective gray haired senior mentor, just kind of rejecting it. I was sort of like, 'Yeah, I'm struggling through that emotion too. But right now I'm the person who gets to be struggling with it, and I need to come to terms with this, and (you need to) help me for a second.'"

Individuals from international medical schools more often shared less basic academic support, although medical students from US medical schools often shared varying levels of support. Many participants talked about the lack of knowledge and preparation about the process.

They indicated if they knew more, it would have been less overwhelming. They often felt alone and isolated in the response, and had their medical school anticipated the need for support and therapy, that would have made a difference to them. One participant discussed described not having a specific faculty mentor to whom to turn for help and support during this experience: "…the deans changed, and my mentor figures [left the institution]. I didn't have anybody in the position of the kind of mentor or monitor that I would have needed." Others described negative experiences linked to administrative issues. For example, one participant described how a required class was scheduled at the time when notices about not matching came out and how embarrassing and challenging it was to receive this news among the rest of the class: "Walking out of the class, I was worried that everyone who saw me walk out of the class at the same time we all got the same email were going to like know exactly why."

3.2.1.4 Participants emphasized personal mindset as key to resilience.

In our participants' narratives, resiliency often came in finding ways to individually persist and make changes. This also came in forms of finding supports, creating supports that didn't exist before, or reframing their mindset to overcome future tough experiences. Many participants focused on the individual mindset and internal resilience regarding reframing the situation. They described how a key element to their ability to cope with and, in many cases, transcend the unmatched experience was reframing how they defined and viewed failure and recognizing this situation as a temporary set-back rather than a reflection of their self-worth or capabilities as a physician. As one participant shared, "I changed my mindset to kind of just accept anything that comes my way and then I accept and kind of process it. If it works for me, I'll keep it around. If it doesn't, then I'll put it off and move on to the next thing." Another participant echoed this: And you know as physicians we're always kind of glorified as these, you know, like seeing people that

have to have all the answers when we're just regular people like you and I. And through those failures, I just adopted a mentality that's it's okay to fail; successful people have failed. It's how you approach those failures." Some described how they the unmatched experience led to getting activated to find ways to advocate for themselves and for other unmatched individuals. Another participant described how the unmatched experience has led to a new focus of activism focusing on changing the opportunities and challenges for unmatched individuals: "We've been contacting congressmen, legislators, senators, you know, writing petition letters to the President."

3.2.1.5 Finding and Using Support Systems Also Helpful

Participants also emphasized how the use of support systems and individuals was essential to coping with the unmatched experience. These supports included family, friends, mentors, or peers. Among these supports, participants described that finding other individuals who had also experienced going unmatched and thus understood the feelings and challenges of going unmatched was particularly helpful. This participant discussed that finding and talking with others who had been unmatched was a key first step: "I used the internet, and you know, I googled unmatched residents… what to do basically from there because no one gives any guidance or any help." Another participant described reaching out to other unmatched students in the class: "I was friends with the couple other people who weren't matched. We actually kind of like all you know tangentially knew each other in the class. And I think we all went [through] the same…painful experience. We kind of bonded." Aside from finding support among other unmatched individuals, participants described how useful it was to share strategies, ideas, resources, and information among this group. One participant discussed meeting regularly with a group of other unmatched individuals via Skype and how they would work to support each other: "You know, [we would talk about] ways to go about matching and people will like giving tips on how would we need to

do to improve our applications all now in our Skype group, you know, we were doing now." Other participants shared how they sought assistance and help from other resources including professionals who specialize in assisting others with applications or resumes, particularly if they received little support from their own institutions, faculty or colleagues. This participant described using such a service:

Lack of support was as equally focused on, with supports from mentors as often a major form of support "In fact, I had to pay someone to help me. You know, with my ERAS application."

3.2.2 Participants' Advice

The second major topical domain in the study was participants' advice regarding not matching. This included personal advice to unmatched students and reapplicants as well as advice to institutions such as medical schools, and broad advice related to systemic issues with the overall medical education system.

3.2.2.1 Advice for unmatched students/reapplicants

Participants discussed advice for future unmatched individuals including: personal development, advice for subsequent application cycle, and post-graduation options. Each individual needed guidance on what would be most advantageous for their personal circumstances and wanted to share what they found to helpful in their personal situations.

In terms of personal development, many individuals suggested finding new hobbies or ways to express their emotions outside of medicine. As one participant suggested: "Try to do all

those random little things just to keep the rest of my life busy." Another participant advised: "…it's easy to say 'just be strong,' but like, find the things that bring you back to what you really are. And these things like CBT [cognitive behavioral therapy], meditation, yoga, and basically structuring your day, they really help you. After all, we are humans… we need support, we need emotional support, and during COVID, it was very difficult for some people to get it."

In terms of applying to residency as a reapplicant, individuals suggested broadening their advisor circles, changing their mindset for interviews, how to address going unmatched in the personal statement, and feelings of despair about the reapplication cycle. For example, this participant described how seeking a broader group of mentors for advice provided more insights to aspects of the application process such as how to better frame the personal statement: "One thing I certainly did is diversified who I was getting advice from…. Some of what I think went wrong the first application cycle is that I was getting advice from [just] a few very well-respected individuals." Others advised to be upfront about not matching in the personal statement: "…For…my second personal statement, …his advice was… to keep most of my first one [because] people thought it was good. But I added a section where I was just upfront about not having matched the last year

In terms of options for, Participants also had many suggestions on how to use the time in between graduation and starting residency that would continue to give professional growth. This included research, improving clinical experiences, teaching, volunteering, and working. For example, this participant continued an ongoing working relationship with a lab: "…This was…a T 32 [research training position], and a lab and a project that I'd already been working on for three

years. So it was a fairly like smooth transition…." Another mentioned finding employment with a health institution: "To me, like I'm lucky enough to have a supportive role. I work with the CDC right now…." Others talked about creating their own opportunities for building clinical experience and skills. One mentioned the ability to qualify for a different type of clinical license that would allow supervised clinical work: "And then I got my I got a Missouri license. It's an AP [advanced practitioner] license system physician license it, I got it in July."

3.2.2.2 Advice for Improving Supports and Changes at Medical Schools

Participants suggested changes that could have benefited them at the medical school level. One recurring theme was the need for a well-planned and organized academic support system before, during, and after going unmatched. This need was shared throughout many of the interviews, with individuals wanting centralized resources to know their future options, direct them to which residency positions they may be more competitive to receive an interview, and guides for other options once they went unmatched. They also suggested ensuring resources for emotional and psychological support as described by this participant's advice: "…Automatically offering students therapists and, especially, you could do it between match day and when they graduate."

Other suggestions were logistical academic supports such as having Match week be protected so they do not experience embarrassment and trauma from finding out they went unmatched in front of peers and so they have ample time to apply to the SOAP process. Participants desired a pre-made list of resources and pathways that other unmatched students have done after going unmatched along with more guidance on which open spots are best to apply to given the limited number of spots to apply to. Some resources specifically desired are other degrees, scholarships, research opportunities with contacts, other career paths, and subsequent match

information from individuals who previously went unmatched. Many individuals wanted medical schools to anticipate that some students will go unmatched and provide talks and resources on this process weeks and months prior to match day. They want this to both be better informed and normalize the process of being unmatched to begin to reduce the stigma of going unmatched. One suggestion was to have willing individuals who had experienced this process share their insights and advice: "…It would have also been really nice to talk to someone who had SOAPed before to kind of like offer support because no one knows what it's like, you know, and it's a very non standardized process, so it would have been really nice to talk to someone who… had gone through it." They finally wanted to automatically be included on the subsequent cycle email threads to receive information on applying and on Dean's letters.

3.2.2.3 Advise for Systemic Changes

Participants expressed the need for change at a systemic level, changing the structure and funding of graduate medical education. This participant noted the challenge of medical student positions outpacing the number of available residency training slots and a need to ensure the system addresses the existing and potentially growing population of unmatched medical students: "Open up more residences…I think they're trying to in the next three years, open up some more residencies, but they're trying to recruit more American undergrads to go to medical school…But what about us? The ones who have graduated and finished our boards? …we're done; we want to start working. How about helping us?" Participants also advised an increase in the funding cap on Medicare for residency positions, and they suggest introducing other clinical positions that act as a safety net for medical school graduates. As one participant noted: "They need Medicare to pay for these residents, you know. Medicare is not giving enough money. They're the ones who fund residency programs, so if they don't have enough money, why not, you know, pay us minimum

wage and put us with outpatient practices and get our training." Another echoed the suggestion to develop additional options: "Yeah, I just wish there was just like more of a safety net for those who don't match. Like maybe they could still work in some regard as a physician or, you know, with a partial license." Some of these changes were based on structures in place in other countries, and other desired changes are changes that many unmatched medical graduates are advocating for at the governmental level: "Maybe it's not your first choice, but you're guaranteed work after you finish school. Okay, so in Poland, they put you straight to work. Same thing in most European countries." One participant decided to explore how to find opportunities in another country after not being successful in the US for many years: "My next thing is to go to Germany and practice medicine. So I started learning German in my spare time to have family there and they said, all you need is the language you need to know the language and, you know, they'll accept our USMLE's."

4.0 Discussion

Our study is the first about which we are aware that details the personal devastation of the experience of medical students not matching into US residency training programs and the limitations of many medical schools' supports for these medical students. Our participants also describe key factors they found helpful in their coping and resilience and provide points of advice for other unmatched students, medical schools and the overall NRMP and residency match system.

The loss of a job has been shown to increase the risk for individuals to have poor mental health outcomes, such as increased levels of depression, anxiety, psychiatric morbidity, and decreased self-esteem and motivation (Caplan, Vinokur, Price, & Van Ryn, 1989). It can lead to a change or loss of identity (Norris, 2016). Additionally, poor mental health has been shown to be both a risk factor for and consequence of unemployment (Olesen, Butterworth, Leach, Kelaher, & Pirkis, 2013). A study aimed to prevent these poor mental health outcomes and promote motivation to find reemployment by randomly assigning individuals to either an intervention by providing support and training individuals in job-seeking and problem-solving or no additional supports (Caplan et al., 1989). The results showed that additional support improved motivation to seek jobs, produced higher rates of employment, and consistent trends towards alleviating negative mental health outcomes (Caplan et al., 1989). Additionally, starting treatment after individuals go through a trauma experience has been shown to be beneficial for these individuals (Price et al., 2018). Going unmatched is essentially losing the chance for employment, and participants in this study repeatedly spoke of their need for emotional and psychological support. The need for better supports after this loss of job opportunity and potentially traumatic experience may

psychologically benefit unmatched medical students and also equip them with tools to improve their chances of finding a clinical position.

The existing literature on unmatched medical education mostly is composed of exploring the current unmatched landscape, how the system has failed, and considerations on some of the current options for unmatched medical graduates (Balon et al., 2020; Bumsted, Schneider, & Deiorio, 2017; Kharofa et al., 2020; Schwan, Abaza, & Cabrera-Muffly, 2015; Traverso & McMahon, 2012), analyses on score reports, interview data, and understanding applicant behavior or qualifications that lead to an unsuccessful match (Liang, Curtin, Signer, & Savoia, 2015, 2017; Schrock, Kraeutler, Dayton, & McCarty, 2017; Tadisina et al., 2016), or advocacy editorials sharing personal experiences of going unmatched or calling for a change in the unmatched medical system (Persad, 2018). The current literature questions the future of graduate medical education and offers unmatched medical graduates options for their gap years and for reapplying, although the information is scattered and in no centralized location. A recent study explored the experiences of 15 unmatched Canadian medical graduates, identifying career outcomes, recommendations, and the unmatched experience. Similarly to our study, the participants overall had poor experiences, felt stigma, and lacked support for applying. They experienced financial burdens, lack of clinical options after going unmatched, and lack of continued medical school support, similarly to the unmatched graduates from US medical schools (Okoniewska, Ladha, & Ma, 2020).

Much of the existing literature focuses on differences between matched and unmatched medical students, trying to understand the behaviors and characteristics that lead a student to going unmatched. This could be less contiguous ranks, lower USMLE scores, research publications, and

prestige of medical schools (Schrock et al., 2017). Although understanding why individuals may not match to make better predictions for future medical students seems reasonable, it also may perpetuate stigma and blame on the students and not focus on systemic factors that lead to so many unmatched medical graduates. Participants in our study focused on their hardships during medical school, including low USMLE scores or lack of interview invitations. One participant questioned the stigma specifically attached to having a failure for a USMLE score. Participants questioned how humanistic and holistic the current approach to selecting medical graduates are; instead of allowing all medical students to have value, the current system along with literature separating the matched from the unmatched places a sense of value on applicants that can affect individuals' self-worth and negate from their accomplishments as graduated physicians.

Finally, resilience was explored by participants in this study. In the literature, resilience has been defined as "positive adaptation, or the ability to maintain or regain mental health, despite experiencing adversity" (Herrman et al., 2011). Individuals discussed their mental health throughout the study, giving suggestions on how they changed or adapted to improve their mental health. Some ways suggested to build resiliency in students include developing feelings of competence, belonging, usefulness, potency, and optimism (Sagor, 1996). In our study, individuals sought to feel useful, repeatedly asking to be used clinically after training for so many years. Others sought to feel competent, finding new skills and continuing to learn even after graduating. Finally, thoughts on giving up versus being hopeful was discussed by many participants, encompassing the very basis of optimism.

One limitation of this study is that participants volunteered to be a part of the study, so the results may not be generalizable to the population of unmatched medical students who would not

be willing to share their own personal experiences. Additionally, our sampling approach was a heterogenous one that sought to identify and describe cross-cutting themes, so that not able to examine themes within groups or by characteristics. Also, there could have been different themes noted had the sample included a greater proportion or diversity of under-represented minorities in medicine.

One implication of this study is that the participants together commented on many suggestions at the medical school level that would potentially make the unmatched experience better. We intend to create and deliver a booklet of these suggestions that could be tested and trialed for future unmatched medical students. Future studies could look specifically at if there are mental health or professional benefits for implementing these suggestions for future unmatched medical students.

4.1 Recommendations

Despite these limitations, our study findings have important implications for supporting unmatched medical students and doctors. Informed by our findings and the existing literature, we propose the following recommendations:

4.1.1 Medical Schools

Medical schools should prepare their students for the applying to residency better, more openly sharing the possibilities of going unmatched, especially in more competitive specialties. Medical schools pride themselves on their match lists, and it is almost shameful to share that many individuals do not match every year. In order to start the process of destigmatizing the unmatched experience and therefore normalizing it, it is essential to allow unmatched medical students first have a voice and second be not considered a blemish to the desired match outcomes. Only by sharing the full match experience will future unmatched medical students feel somewhat prepared after receiving the information that they have not matched. Additionally, match week is a stressful experience, especially for individuals who have gone unmatched. Planning ahead to create schedules that allow for unmatched medical students to go through SOAP and being processing their potential trauma from going unmatched is essential. This could be achieved in various fashions, but at the minimum should include lack of clinical and academic responsibilities on the Monday of match week to prevent individuals from being in class or on rounds when they find out they do not match. While SOAPing, interviews can come at any period throughout the week, and medical students need time to complete those interviews. Excusing unmatched medical students from all academic and clinical duties throughout that week would likely lessen the burden. Finally, providing both thorough academic and emotional support is essential. Training all faculty members who will be helping with SOAPing on the process, how to emotionally support their students, and how to guide their students on the varying trajectories and options they have after going unmatched would be helpful. Additionally, immediately providing and having therapists on site and on call for unmatched medical students during match week and beyond would be helpful for the healing process. Finally, realizing that going unmatched is a journey that lasts longer than solely Match

week would be helpful. Medical schools should immediately plug unmatched medical students in with the subsequent year's email list, providing them with information that the following year's applicants will automatically be receiving.

4.1.2 Supports

Medical graduates express loneliness and isolation after going unmatched. Most participants either directly or indirectly stated that they would like a support group, whether it be with other unmatched medical students at their medical institution or nationally. A national support group, such as through the American Medical Association or some other national organization, that is composed of entirely previously unmatched medical students would at least partially fill this need. This type of organization would be able to both help with emotionally supporting newly unmatched medical students and previously unmatched medical graduates who continue to go unmatched or anyone who need a safe space to speak about their traumas after going unmatched. This type of organization could also help with centralizing and dispersing academic and professional support to unmatched medical students/graduates.

4.1.3 Systemic Changes

The state of the unmatched medical system does not receive the national attention that it deserves, and participants would like to start the conversation nationally on the current state of the unmatched system. Additionally, participants find it concerning and a national issue that there is not a safety net for unmatched medical graduates. Some participants used other medical systems, such as in Poland, as an example of what forms of changes could be implemented in the US. One

example of this that was suggested is to allow for all medical graduates to practice under some partial license or new role such as a generalist. Other suggestions include creating pathways to ensure all medical graduates can become a licensed doctor such as opening more preliminary residency positions, creating more residency spots, or doing something other clinical experience than a residency position that allows for them to get their license. Financially, medical graduates want to the Medicare cap removed or revisited so more residency positions can be created.

5.0 Conclusion

Themes of the experience of being an unmatched medical student and the advice that unmatched medical students have to make the system better emerged through this study. Medical students want more emotional and logistical support after not matching, including therapists, supports from other unmatched students, and protected time to complete the SOAP process. Unmatched doctors want and are advocating for other options to use their skills, whether it be new residency programs, a new type of residency, or different licensing. More research needs to be done to better understand, support, and advocate for unmatched medical students, especially as residency spots are not increasing at the same rates as medical school trainees.

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