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Exploring US internal medicine resident career preferences: a Q-methodology study

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Abstract

Career selection in medicine is a complex and underexplored process. Most medical career studies performed in the U.S. focused on the effect of demographic variables and medical education debt on career choice. Considering ongoing U.S. physician workforce shortages and the trilateral adaptive model of career decision making, a robust assessment of professional attitudes and work-life preferences is necessary. The objective of this study was to explore and define the dominant viewpoints related to career choice selection in a cohort of U.S. IM residents. We administered an electronic Q-sort in which 218 IM residents sorted 50 statements reflecting the spectrum of opinions that influence postgraduate career choice decisions. Participants provided comments that explained the reasoning behind their individual responses. In the final year of residency training, we ascertained participating residents' chosen career. Factor analysis grouped similar sorts and revealed four distinct viewpoints. We characterized the viewpoints as "Fellowship-Bound-Academic," "Altruistic-Longitudinal-Generalist," "Inpatient-Burnout-Aware," and "Lifestyle-Focused-Consultant." There is concordance between residents who loaded significantly onto a viewpoint and their ultimate career choice. Four dominant career choice viewpoints were found among contemporary U.S. IM residents. These viewpoints reflect the intersection of competing priorities, personal interests, professional identity, socio-economic factors, and work/life satisfaction. Better appreciation of determinants of IM residents' career choices may help address workforce shortages and enhance professional satisfaction.

Keywords Internal medicine · Postgraduate · Q-sort · Q-methodology · Career decision · Psychometrics · Medical education research

Introduction

Many factors contribute to medical graduates' decisions about their chosen career path.

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In the US, nearly one-quarter of all postgraduate training positions are in Internal Medicine (IM) (NRMP, 2020). Therefore, there is great interest in IM trainees' career choices because they influence both the depth and breadth of the entire US physician workforce, which may not always align with societal needs. Despite a great need for primary care physicians in the US, interest in primary care careers has declined among internal medicine (IM) residents over the last 20 years (West & Dupras, 2012, Garibaldi et al., 2005). Among the IM subspecialties, some (like cardiology and gastroenterology) are highly competitive and consistently fill 99% of their available training positions (NRMP, 2020). In contrast, other subspecialties like geriatrics and nephrology have seen a drastic decline in applications and filled positions in recent years, leading to concerns about unmet community needs and impending workforce shortages (NRMP, 2020, Parker et al., 2011).

Due to disparities between IM physician supply and societal need, researchers have looked for the variables that associate with career selection. Prior studies of North American IM trainees have identified many socio-demographic factors (age, gender, race, marital status, and educational debt) and professional preferences (time with family, opportunities for procedures, work/life balance, intellectual interest, patient continuity, scope of practice, remuneration, and the presence of a mentor) that associate with career selection (Kassebaum and Szenas, 1992, Hauer et al., 2008, Kassebaum & Szenas, 1994, Dorsey et al., 2003, Dorsey et al., 2005, Diehl et al., 2006, McDonald et al., 2008, Garibaldi et al., 2005, West et al., 2009, Horn et al., 2008, Daniels & Kassam, 2011, Douglas et al., 2018). In both the UK and Australia, recent longitudinal surveys of graduating medical students and junior physicians observed similar trends regarding the influence of expected future income, controllable work hours, lifestyle, and intrinsic interest in general practice on final career selection (Cleland et al., 2014; Kumwenda et al., 2019; Sivey et al., 2012; Lennon et al., 2019).

However, the relevance of these studies to the US workforce is limited for two reasons. First, many of these studies are outdated. Since 2005, the medical workforce has changed: there are now more female than male graduates of U.S. medical schools (AAMC, 2020), the current generation of workers are more willing to make career sacrifices to share family responsibilities compared to prior generations (Global Generations, 2018), and in the US, hospital medicine has emerged as a popular, alternate pathway to primary care or subspecialization (Ratelle et al., 2014). Second, we now recognize that residents experience high levels of burnout and low professional satisfaction during training (Dyrbye et al., 2014, 2016; Ludmerer, 2005). When studied recently, burnout and professional satisfaction during training directly affects career choice decisions, career choice regret, and breadth of the physician workforce (Dyrbye et al., 2018; Lennon et al., 2020). However, burnout and professional satisfaction were conspicuously not assessed in earlier IM-focused career choice studies.

These existing studies mostly focused on individual demographics and conscious preferences during medical school (before entering the workforce.) To better understand career decision making, an updated theory on career selection is needed. Historical approaches to career selection relied on trait-factor theory, which proposed that career selection is made by simply matching individual traits to work requirements (Parsons, 1909). Krieshok et al. (2009) proposes an updated theory of career decision making, called the trilateral adaptive model. This theory places greater emphasis on the interplay between conscious/rational, non-conscious/intuitive thoughts, and how these thoughts are influenced by adapting to an ever-changing environment. In the context of medical career decision making, the trilateral adaptive model suggests that occupational enrichment during post-graduate residency training is the optimal time for exploration, socialization, and having the experiences

that test the individual's flexibility, resilience, and tolerance for ambiguity. Occupational engagement plus the interplay between rational and intuitive thoughts here serves as a catalyst for professional identity formation (Cruess et al., 2015) and career decision making.

Medical career choice decisions are inherently complex processes driven by a multitude of subjective variables and experiences that vary in importance from person to person. Likert scale surveys have been used to measure subjectivity, but quantitative analysis of these responses is fraught with methodologic assumptions (confusion between ordinal and interval scales) and systematic errors (Jamieson, 2004). For example, Likert scale surveys are sensitive to desirability bias and response-style bias, in which content-irrelevant factors (survey structure, question characteristics, category characteristics, and response scale characteristics) influence the participants' responses (Kieruj & Moors, 2010; Baumgartner & Steenkamp, 2001). Collectively, these issues limit the ability to intercorrelate resident preferences and draw meaningful conclusions from Likert scale surveys. Some researchers have evaluated physician career preferences with the more robust discrete choice experiment (Kalb et al., 2018), which is an experiment used to elicit preferences without directly asking participants to state them. While helpful for analyzing latent preferences regarding specific decisions or trade-offs, the discrete choice experiment is not designed to understand the various 'types' of decision makers across the spectrum of potential variables. Also, this type of study has not been performed on US IM trainees, who exist in a unique socio-cultural training context compared to other countries. Informed by the trilateral adaptive model of career decision making, we believe a different, exploratory research approach is needed to better understand the number and diversity of unique viewpoints regarding career choice selection among IM trainees.

We chose to use Q-methodology, which is a mixed methodology for defining subjective viewpoints (Brown, 1996; McKeown & Thomas, 2013). In Q-methodology, subjects rank a series of relevant declarative statements against all others to elicit a hierarchy of agreement, which overcomes the systematic errors seen in Likert scale surveys. This allows the researcher to intercorrelate dimensions of subjectivity between the participants. In other words, the purpose is to identify the number and types of viewpoints present, not to test the proportional distribution of these viewpoints within the larger population (Valenta & Wigger, 1997; Watts & Stenner, 2012). Informed by the trilateral adaptive model of career selection, our primary objective is to explore and identify the latent variables or 'types' of decision-makers in a cohort of US IM residents. Our secondary objective was to measure associations between any identified viewpoint groupings and final career choice made at the end of residency training.

Materials and methods

Q-*methodology*

Q-methodology is an approach to study subjectivity. We chose to perform an exploratory Q-study that allowed IM residents to define what matters most for career decisions. Q-methodology allows the researcher to extract and describe the unique viewpoints by performing factor analysis on participants' Q-sorts. As opposed to typical factor analysis, the variables are the individuals (not traits of the individuals), and the validity of the results is less sensitive to sample size or response rates (Valenta & Wigger, 1997). Participants in a Q-study create Q-sorts by placing a series of statements onto a score sheet that has been ranked with

columns representing the spectrum from *most disagree* to *most agree*. This design allows the participant to provide a snapshot of their subjective viewpoint. Finally, participants give commentary on statements ranked at each extreme column of the distribution map. All the Q-sorts are then subjected to by-person factor analysis, which identifies latent correlations between participants (not participant traits). A viewpoint profile is defined by the unique list of distinguishing statements and scores on the agree-disagree spectrum, such that a composite Q-sort is created for each viewpoint. The narrative comments associated with statements can then be used to understand the rationale for the statement scores.

Definition of the Q-sample

In a Q-study, the researchers develop the set of statements to be sorted. To generate the set of statements for this study, we examined peer-reviewed journal articles that studied IM resident career selection (West & Dupras, 2012; Garibaldi et al., 2005; Kassebaum & Szenas, 1992; Hauer et al., 2008; Kassebaum & Szenas, 1994; Dorsey et al., 2003; Dorsey et al., 2005; Diehl et al., 2006; McDonald et al., 2008; Garibaldi et al., 2005; West et al., 2009; Horn et al., 2008; Daniels & Kassam, 2011; Ratelle et al., 2014; Dyrbye et al., 2014, 2018; Daniels & Kassam, 2013; Douglas et al., 2018). The lead researcher (JKR) formulated a concourse of 75 statements, including statements from a study of Canadian IM residents (Daniels & Kassam, 2013), used with permission. Two investigators with experience writing Q-sort statements (JKR and CWH) (Roberts et al., 2015, Roberts et al., 2016, Dotters-Katz et al., 2016, Hargett et al., 2017) were selected to group the statements into relevant themes and judge them according to thematic completeness and relevance. All statements were crafted to be legible, unambiguous, and not overly positive or negative in tone. The investigators refined, deleted, and combined statements in each thematic group to arrive at a final set of 50 statements across the themes thought to influence career selection (See Fig. 1 for the final statement set organized by theme.)

Study sites and population

The study included IM residents at ten accredited U.S residency training programs. We first conducted a pilot study at Duke University Medical Center between November 2018 and January 2019. In the pilot, we observed no problems with the Q-sort procedure or any problems regarding any statements in the Q-sample. We then continued the study at the following residency programs between November 2019 through February 2020: Rush University, Stanford University, University of Colorado, Oregon Health & Science University, Northwestern University, University of Iowa-Des Moines, Beth Israel Deaconess Medical Center, Vanderbilt University Medical Center, and Mount Sinai Hospital. We chose these sites based on the program's willingness to participate and our desire to achieve broad geographic representation. Individual training programs invited their residents to complete the survey during the study period. Resident participation was voluntary, and a raffle for $50 Amazon gift cards was used to incentivize participation.

Procedure and data collection

We delivered the survey electronically using FlashQ (Version 1.0, Hackert and Braehler, Germany), a web-based program designed to administer a Q-study. Supplemental Fig. 1

Theme	Statements	Composite Q-Sorts			
		Fellowship Bound-Academic	Altruistic Longitudinal Generalist	Inpatient Burnout Aware	Lifestyle Focused Consultant
Scope of Practice	I prefer to be an expert in a single area.	2*	-4*	-4*	4*
	I prefer being the consultant.	1*	-3*	-3*	3*
	I like a little bit of everything and variety.	2*	5	5	-2*
	Some Sub-specialists can still serve as a general internist.	2*	1*	0	0
	With the amount of knowledge out there it's hard to keep up.	-1*	1	1	1
	I really like the general medicine population of patients.	-1*	4*	3*	-4
	Hospital medicine admits the patients nobody wants.	-2	-2	-1	0*
Fellowship, Research, & Teaching	I want opportunities to teach students and residents.	5*	4*	2*	0*
	The professional development opportunities of a fellowship program are important to me.	4*	0*	-2*	0*
	I value having opportunities for research.	4*	0*	-3*	-3*
	My career decision is driven by a specific research interest.	0*	-3*	-5*	-5*
Intellectual Interest	My career decision is based on a specific interest in physiology.	5*	-3*	-1*	1*
	My career decision is based on a specific interest in single organ diseases	-1*	-5	-4	2*
	My patients are fascinating.	3	3	1*	0*
Length of Training	I am willing to do as many years in training as it takes to achieve the career I want.	3*	-2	-4*	-2
	It is important to me to finish training as soon as possible	-5*	-1	1*	-1
	I want to be done after my three years of IM training.	-5*	0*	1*	-3*
Practice Preferences	I prefer an outpatient-based practice.	-4*	2	-5*	3
	I prefer an inpatient-based practice.	0*	-4*	5*	-5*
	I'd like a combination of inpatient and outpatient practice.	2	2	-2*	1*
	I want to do procedures as part of my practice.	3*	-1	1*	-1
	I primarily enjoy a mix of outpatient long-term care and acute care.	1*	2*	-2*	-1*
	I primarily enjoy having continuity of patient care.	-2	5*	-2	3*
	I primarily enjoy acute, episodic patient care.	0*	-5*	4*	-3*
Work-Life Integration	Medicine sub-specialists work too hard.	-3*	-3	-1*	-2
	Hospitalists work too hard.	-3*	-1	-2	-1*
	I value having more time for my personal life.	1*	3*	4*	5*
	Lifestyle and control over my practice is important to me.	1*	3	4	5*
	I am willing to make career sacrifices to have a good work-life balance.	0*	3	3	4
	Family responsibilities affect my career decisions	0*	1	1	1
	I am willing to make career sacrifices to support my lifestyle.	-1*	2	2	2
Burnout Consideration	When choosing a career, I think about the risk of burnout with each career choice.	-1*	1	3	1
	When choosing a career, I consider the risk of physician burnout.	0*	1	2*	2
Career Prospects	I want to have great job prospects.	2	1	2*	3*
	I want to be in a field that is in demand.	0	0	0	2*
Debt and Remuneration	Some specialties are not fairly reimbursed, and this is important to me.	-1	-1	0*	2*
	Student loan debt affects my career decisions.	-4*	-4*	0	-1
	I want a career that pays well given how long I've trained.	1*	-1*	3*	4*
Prestige	Prestige and respect from my peers matter to me.	0	-1*	0*	0
	Prestige and respect from the public matter to me.	-2	-2	-1	0*
Service	I chose my career because I want to work with underserved patients and reduce disparities.	-2	4*	-1	-4*
Diversity	Issues surrounding diversity & inclusion have influenced my career decision.	-3	0*	-3	-4*
Location of Practice	I want to work in a smaller community.	-4*	-2	-3	-3*
	I want to work in a large city.	1*	0	0	-1*
Interpersonal Experiences	Career decisions are predominantly based on my experiences as a medical student.	-3*	-2	-1	-2*
	The positive interactions I have with a faculty role model affect my career decisions.	4*	2	2	1*
	The negative interactions I have with a faculty role model affect my career decisions.	-1	0*	0	-2
	The positive interactions I have with fellows affect my career decisions.	1*	0	0	1*
	A mentor played a role in my career decision.	3*	1	1	0*

Fig. 1 Representative (Composite) Q-sorts for each of the four viewpoints. Positive Q-sort values represent agreement (green shading), and negative values represent disagreement (red shading) with the statement. Distinguishing statements (*) have Q-sort values with significance at $P < 0.05$

shows the procedure for completing the Q-study. First, FlashQ randomly presented each of the 50 statements as a card to be sorted into one of three initial piles: agree, neutral, or disagree. Next, the resident was asked to pull cards from these piles and place them into the Q-Sort diagram columns rated from *strongly agree* (+5) to *strongly disagree* (-5). Participants were given a final option to swap card positions across the diagram. At the conclusion of the survey, all columns on the score sheet were occupied by a statement card. Finally, participants had the opportunity to provide written commentary on the two statements with which they most agreed and most disagreed.

We collected sociodemographic information including gender, age at medical school graduation, training site location, post-graduate training year, educational debt, and residents' final career choice, which was defined as the career chosen at the beginning of their final year of training. Residents who had not yet decided on final careers and residents who did not provide identifying information were counted as missing. Compensation categories (normal vs. high) were defined according to a recent physician salary survey (Medscape, 2019). Specialties with an average physician salary that was within $50,000 of the mean salary for general IM were coded as "normal compensation." Specialties with an average physician salary greater than $50,000 above the mean salary for general IM were coded as "high compensation" careers.

Factor analysis

We used PQMethod software (Version 2.33, Schmolck, Germany), which performs by-person factor analysis. We input 218 sorts into PQMethod software, which then created an inter-correlation matrix for the participants. We extracted factors according to Horst's centroid method, followed by varimax rotation. We extracted factors and chose the factor solution according to published methodological criteria (factor eigenvalues > 1) (Watts and Stenner, 2012) and whether the solution had a coherent interpretation supported by the narrative comments. Using Horst's method, PQMethod extracted four factors and stopped after reaching the limiting level of residual correlations (further factor extraction explained < 3% of residual variance). A five and six-factor solution was also analyzed, and we thought that the four-factor solution was the most coherent and best supported by narrative commentary. A "defining sort" was any sort that loaded significantly ($\gamma > 0.32$ for a 95% confidence interval) on only one unique factor. The authors interpreted the defining Q-sort matrix, read the associated narrative comments, and found consensus on the appropriate label for each of the four profiles.

Statistical analysis

We conducted all quantitative analyses in STATA, version 14.0 (Statacorp, College Station, Texas). Normally distributed data are reported as mean ± standard deviation (SD). Age was treated as a continuous variable and compared across groups using t-tests (analyses of 2 groups) or one-way analysis of variance (analyses of > 2 groups). Two-tailed P values less than 5% were considered statistically significant. We used the Bonferroni correction in instances of multiple comparisons. Gender was analyzed as female, male, and non-binary. Educational debt was analyzed categorically as no debt, < $100,000, $100,000–300,000, and > $300,000. Geographic training site was analyzed as Southeast, Northeast, Central, and West. To compare the association of demographic variables with viewpoint groups, we performed multinomial logistic regression with the viewpoint groups as the dependent variable and demographics as predictors. To investigate associations of the four career choice viewpoints with ultimate career choice categories (high vs. low compensation, inpatient vs. outpatient, subspecialty vs. general IM), we used logistic regression including the viewpoint groups as the independent variable and career categories as the outcome variables. For both sets of analyses, the "Unaffiliated" group (residents who did not statistically sort into a defined viewpoint) served as the referent viewpoint group.

All participant responses were kept confidential and private. Resident responses were not released or shared with residency program leadership. Participation in the study was voluntary.

The Duke Institutional Review Board reviewed and approved this study prior to data collection.

Results

A total of 218 residents participated in the Q-study. 161 (74%) of the respondents identified as being in the PGY-2 year of training or above. The mean age at the time of medical school graduation was 26.9 (2.2). 130 (60%) of the respondents identified having educational debt. Geographically, more participants were from the Southern (31%) and Western regions (33%), compared to the Northeast (17%) and Midwest (19%). 102 (47%) identified as female, 94 (43%) identified as male, and 2 (1%) identified as non-binary.

Descriptions of four career choice viewpoints

We characterized resident career choice profiles according to the four-factor solution. Residents that were not uniquely associated with a single factor were placed in the "*Unaffiliated*" group. Table 1 shows the correlations between factor scores for each factor. Figure 1 contains the representative (composite) Q-sorts for each of the four viewpoints. Positive Q-sort values represent agreement and negative values represent disagreement with the statement. Table 2 lists representative comments from residents who defined each factor. The comments are aggregated according to the broad subject domains from which the associated statements came.

Fellowship-bound-academic (Factor 1)

This group was defined by 63 residents. These residents are driven primarily by an interest in human physiology and career in academic medicine. They strongly value having future opportunities to conduct research and teach others. Their career interests have been influenced by the presence of a mentor or faculty role model. They are interested in becoming an expert in a single area as opposed to working as a generalist. They are also interested in performing procedures as a part of their clinical practice. Career decisions for this group are less affected by the presence of student loan debt, but instead they are primarily driven by intellectual curiosity, teaching, and scholarly work. Therefore, this group is looking forward to the professional development opportunities of a fellowship training program. These residents are not interested in finishing their training as soon as possible: they are lifelong learners who are willing to train as long as is necessary to achieve their desired career.

Altruistic-longitudinal-generalist (Factor 2)

This group was defined by 43 residents. This group embraces holistic patient care, and they are sustained by clinical variety and close, longitudinal relationships with patients. They do not have much interest in being the expert or consultant, but instead seek ownership and assuming longitudinal responsibility for their patients' care. To achieve this, they prefer

Table 1 Correlations between factor scores for each factor

Factor	Factor 1: Fellowship-bound-academic	Factor 2: Altruistic-longitudinal-generalist	Factor 3: Inpatient-burnout aware	Factor 4: Lifestyle-focused consultants
Factor 1: Fellowship-bound-academic	1.00	0.26	0.24	0.32
Factor 2: Altruistic-longitudinal-generalist	0.26	1.00	0.41	0.30
Factor 3: Inpatient-burnout aware	0.24	0.41	1.00	0.16
Factor 4: Lifestyle-focused consultants	0.32	0.30	0.16	1.00

an outpatient/ambulatory practice as opposed to an inpatient-based practice. They are not motivated by interest in single organ diseases, research, or human physiology, but instead they enjoy a broad range of clinical interests and patient care responsibilities. They have a strong interest in teaching residents and students. They value having personal time and are willing to make career sacrifices to achieve better work-life balance, acknowledging that self-care will help them be better doctors. Their career choices are not affected by student loan debt or remuneration, but instead they are highly motivated to care for underserved patients and reduce disparities through their practice.

Inpatient-burnout-aware (Factor 3)

This group was defined by 34 residents. These residents strongly prefer acute, episodic patient care in the inpatient setting. This group enjoys a wide variety of practice over specialization, but they strongly prefer the inpatient setting in part due to more predictable time management and control compared to the outpatient setting. They are not motivated by research interests or specific single organ diseases but are instead interested in a little bit of everything. They strongly value having more personal time and lifestyle control, and they are willing to make career sacrifices to obtain a good work-life balance. They have thought hard about the consequences of physician burnout and have considered this risk when deciding a career. They are not willing to endure any more years of training: they are eager to finish and start a career that pays well given how long they have been a student/trainee thus far.

Lifestyle-focused consultant (Factor 4)

This group was defined by 33 residents. They strongly value preserving personal time and having considerable control over their lifestyle and future practice. They prefer being a consultant with expertise in a single area as opposed to being a generalist. They also have a strong preference for outpatient, longitudinal care and they have an aversion to episodic, inpatient care. They are not motivated by research interests or working with underserved patients. Instead, they are strongly interested in a career that pays well and will be in demand with good job prospects. They are mindful of physician burnout, but they are especially sensitive to physician remuneration, desiring a career that will pay well. The

Table 2 Representative comments written by internal medicine residents who defined the four viewpoints. Comments were given in response to defining statements ranked at the most agreed (+5) and most disagreed (-5) column of the individual's score sheet diagram. Comments are aggregated by relevant categories

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Fellowship-Bound-Academic

Academic research, and teaching

Being in an academic setting and teaching is incredibly important—I saw that individuals in my specialty of choice were my favorite teachers

I love teaching and definitely will include education as part of my future career

I want to eventually do like 80:20 research/clinical time. I feel like you are able to reach more patients through research

Research drives learning and advances our understanding of medicine. Without research, we are just standing still

Length of training

I enjoy learning and improving myself to the best of my abilities. I enjoy being a trainee and am willing to train for many years to be able to do exactly what I want for my career

I am planning on a career in academic medicine and know forever training is a part of that. I am in no rush to be an attending

I have no problem training for several more years to feel happy at the end of a workday

Scope of practice

As a physician scientist, I feel the need to subspecialize in order for my clinical practice to be both manageable and to provide high quality care for my patients

I feel that the general medicine population includes a high number of patients who are socially or psychiatrically complex more so than medically interesting

Debt and Remuneration

I have been beyond blessed to have a family who paid for my education

I am fortunate to have minimal debt. I just want to find a job that I enjoy enough

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Altruistic-longitudinal-generalist

Scope of Practice

I would prefer to be the Jack of all trades than be the definitive expert in a limited practice area

I will burn out more quickly if I do the same thing all day every day. Plus, I like a lot of different responsibilities

I value the diversity of patients, medicine, and challenges in primary care with a mix of continuity and acute care

I like having ownership of the patient. Being a consultant doesn't feel like true patient care to me

Teaching

Medical Education is one of the ways I define myself (in my career) and has guided my thoughts on what career to choose to be able to teach the way I want

Involvement in education is my primary career goal

I enjoy teaching and would like to continue teaching residents and medical students in my future job

Work-life integration

Having time for personal time makes you a more humanistic and approachable physician

While work is important, I do not intend to live to work

Medicine is a job and a part of my life, but it is extremely important to me to build time to nourish the other aspects of my life

narrative comments for this group (see Table 2) suggest how high levels of student loan debt influence this perspective.

Table 2 (continued)

Altruistic-longitudinal-generalist

Practice preferences

The prospect of longitudinal relationships with patients is a major part of what motivated me to go into medicine in the first place

Again, I like the mix of continuity and keeping patients healthy, as well as treating people who are sick

I think one of the most powerful things is a good, long standing relationship between a PCP and a patient. It's wonderful to develop those and to see people through their entire lives hopefully

Service

There is a breath of pathology that gen medicine gets to see. The diversity in terms of physical, social, and mental pathology is unmatched. It keeps me in tune with my social justice side while also keeping my medical hat on

Working with underserved populations inspires and motivates me to keep coming to work when I am getting tired or bored. Providing excellent, comprehensive care for those who cannot always get it is an important mission through which I feel like I can make my own unique impact on the world

I went into medicine to understand the socioeconomic and sociocultural contexts in which people experience health and illness, and for the relationships that that necessitates, which in itself required continuity of care

Inpatient-burnout aware

Practice Preferences

I like the pace of an inpatient setting. In clinic patients can be late or early and you can run behind. Inpatient time management is much easier and makes more sense

I like my days to be under my control and to have it flow the way I like it. The inpatient world gives me more control of how my days go

Hospital medicine, in my opinion, admits the patients that require more care than can be provided by a sub-specialist

Work-life integration

I used to think that any amount of training was worth it but I'm really tired of all the sacrifices that training entails and I'm totally fine compromising some career prospects to have a stable life as an attending

Residency has elucidated what is most important to me—to enjoy my life and my work, and that it is worth it to me to take less pay and/or miss out on promotions to achieve this balance. I realize that working too much causes me to hate my work, and I would rather work less and love my work than burn out

I have worked really hard for my entire life and I'm done with it. It's time to actually enjoy myself, spend time with my family, and live a little

Burnout consideration

Work-life balance is very important to me, especially seeing the amount of burnout in older physicians

Being a physician is my profession and my vocation, but it is not my only identity

I think burnout, more than any other problem for physicians, has the potential to spell career death

Being a physician is so inextricable for many physicians' identity that if you lose your enjoyment, you leave yourself open to serious mental health issues that come with a crisis of identity

Scope of practice

I prefer to see patients with a variety of pathologies, rather than focus on one specific pathology or organ system. I enjoy the complexity of managing multiple pathologies at one time

The breadth of internal medicine certainly fits with my interests of knowing "a little about a lot." I think this makes the job interesting and flavorful

I like the variety; it is mentally stimulating to see more than one problem and more than one organ system involved

Table 2 (continued)

Lifestyle-focused consultants

Work-Life Integration

Ultimately, I see medicine as a job, which I do enjoy, but I do not see it as being something to sacrifice

Everything else in my life for

Being a doctor isn't my life's calling and I will always choose lifestyle

I enjoy medicine, but medicine is not my entire life. My personal life- specifically relationships with my husband, family members, friends, and hopefully future children will always take precedent. I prioritize time to do things that make me happy outside of medicine

Practice preferences

I enjoy the ability to develop long-term relationships with patients in the outpatient setting, but also like the acuity of procedures I hope to do in the future

My major drive for going into medicine was to connect with patients. I want to have longitudinal relationships with those I care for

I do not like sick, hospitalized patients. I do not like the structure of the hospital and the workflow

Scope of practice

Being the expert is important to me because I don't like dealing with all of the other dumb problems and I like just making recommendations and walking away

As a consultant you although may see more patients, but have the luxury of making your own time and not bogged down by grinding things like patients wanting to leave AMA, nursing calls, hospital pressure to discharge. Additionally, you are seen as providing a solitary service that can help and are respected

Internal Medicine gets dumped on by all the other specialties and most of the patients I get are just waiting for placement

I experience burnout when taking care of general medicine patients for long periods of time because you spend less time making medical decisions and more time dealing with social issues and placement challenges

Debt and remuneration

It's important to choose a field that reimburses well given I am older and have lots of student debt

I have a large amount of student loans and in order to not have a financial burden on my family it is important that the decisions I make are logically based in practicality not just emotionally

I have over 300 k in medical school (not undergraduate) loans. This affected my choice of specialty, training location, etc

Effects of demographics on viewpoint group

Multinomial regression analysis on age at medical school graduation only showed a significant association between age and being in the "*Altruistic-Longitudinal-Generalist*" group (OR per year 1.43, 95% CI 1.11–1.85, P < 0.006). Multinomial regression on gender categories, educational debt categories, and PGY year showed no significant associations with viewpoint groups.

Final career choice

Table 3 shows residents' final career choices according to their Q-sort derived profiles. For each of the four viewpoints, we observed concordance between the residents' practice preferences and the career they ultimately chose. Figure 2 shows the odds of choosing a career category (subspecialty vs. general IM, inpatient vs. outpatient career, and high compensation vs. normal compensation career) according to being a defining member of one of

the four viewpoints. Age, gender, geographic region, and medical education debt were not associated with choice according to the career categories.

Discussion

We distinguished IM residents in the US according to four career choice profiles that reflect characteristic covariation according to practice preferences, intellectual interests, professional identity, socio-economic factors, concerns about work/life balance and professional burnout. These findings advance the discussion of career selection in the modern era. In line with an existing Q study (Daniels and Kassam, 2013), we observed a group that was interested in sub-specialization, longer training time, and interest in procedures ("*Fellowship-Bound Academic*"). In follow up, most of the residents in this group went into subspecialties like Cardiology, Pulmonary-Critical Care Medicine, Hematology-Oncology, and Infectious Disease. While we also identified some residents with a strong preference for variety and general internal medicine (GIM) like Daniels and Kassam (2013), we were able to further distinguish them in two viewpoints ("*Altruistic-Longitudinal-Generalist*" and "*Inpatient-Burnout Aware*") that primarily differed according to location of practice, patient continuity, altruism, remuneration, and concerns over burnout. Consistent with our factor grouping, most of the residents in the "*Altruistic-Longitudinal-Generalist*" group chose a GIM-primary care career, while most of the residents in the "*Inpatient-Burnout Aware*" group chose a GIM-hospitalist career. Unlike existing studies, we observed the novel influence of physician burnout, negative attitudes towards hospitalized patients, concerns about work-life integration, perceived prestige, loss of physician autonomy, and remuneration concerns, particularly among the "*Inpatient-Burnout-Aware*" and "*Lifestyle-Focused Consultant*" groups. These attitudes are congruent to a country with high medical education costs, fee-for-service payment structure, and structural bias against general practice (Rosenthal et al., 1994; Dowdy, 2011; Greysen et al., 2011; Palmeri et al. 2010). In follow-up, most of the residents who made up the "*Lifestyle-Focused Consultant*" group went into high remuneration specialties like Gastroenterology and Hematology-Oncology.

Our findings align with contemporary professional identity formation and career decision theories. For example, Cruess et al. (2015) applied social learning theory concepts like communities of practice (Wenger, 1998) and situated learning (Lave & Wenger, 1991) to describe professional identity formation in medical education. In this framework, socialization in the training environment is influenced by a multitude of different factors (clinical/non-clinical experiences, role-models/mentors, and internal or external attitudes) through either conscious reflection or unconscious acquisition. In terms of identity formation, the significance of each varies from person to person. For example, in our study, having a role-model/mentor and positive attitudes towards research/scholarship uniquely influenced the "*Fellowship-Bound Academic*," while aversion to inpatient general medicine and a desire for control and high remuneration influenced the "*Lifestyle-Focused Consultant*." Witnessing physician burnout (or perhaps experiencing burnout themselves) uniquely influenced the "*Inpatient-Burnout Aware*" residents in their career choice. In accordance with the trilateral adaptive model of career decision making, our results demonstrate how professional identity and career choices are influenced by occupational enrichment and how the individual responds to a complex and changing environment.

Table 3 Final career choice of study participants according to Q-sort viewpoint

Final career choice	Total	Fellowship-bound-academic	Altruistic-longitudinal-generalist	Inpatient-burnout-aware	Lifestyle-focused-consultant	Unaffiliated
Total	218	63	43	34	33	45
Cardiology	20	8	0	1	4	7
Nephrology	7	3	0	1	0	3
Infectious Disease	5	5	0	0	0	0
Pulmonary and Critical Care	31	17	0	6	0	8
Endocrinology	3	0	1	0	2	0
Geriatrics	2	0	2	0	0	0
Rheumatology	5	0	3	0	0	2
GIM-PC	28	1	23	0	1	3
GIM-H	24	3	1	18	2	0
Hematology and Oncology	22	7	2	0	9	4
Gastroenterology	18	4	1	0	9	4
Palliative Medicine	2	0	0	1	1	0
Sports Medicine	1	0	0	0	1	0
Missing	50	15	10	7	4	14

GIM-PC: General internal medicine primary care; GIM-H: general internal medicine-hospital medicine

These results raise questions worthy of future investigation. For example, how stable are these viewpoints over time? To what extent, if any, have these attitudes changed from matriculation into medical school through the final year of residency? To what extent does burnout during residency training or perceptions of burnout in different careers influence final career selection? To what extent are attitudes intrinsic to the trainee vs. adopted by the trainee as they align with perceived values of a given specialty?

Until that work is complete, we've identified some practical uses for these results. First, careers or subspecialties with workforce shortages could use these foundational viewpoints to guide educational efforts, career advertising, or practice overhaul to restore recruitment. For example, subspecialties at risk of workforce shortages could tailor clinical training experiences to better reflect the breadth of practice opportunities within the subspecialty. Second, knowledge of these viewpoints can inform discussions and policy decisions aimed at addressing residency training environments, professional satisfaction, and trainee burnout. For example, our results raise questions about inpatient learning environments and the negative experiences that might influence practice preferences and career decisions. Third, while our results reflect attitudes and perspectives of trainees in the US, the Q-sort activity presented here could be easily replicated in other countries, providing a robust assessment of trainee preferences in different contexts. Finally, because resident viewpoints correlate well with final career choice, the Q-sort activity could be used by individual training programs as a formative career self-assessment. The sorting task could help an undecided resident prioritize her/his interests and preferences, leading to fruitful discussions, coaching, and career counseling from the program leadership.

Our study has limitations. First, the single assessment of resident perspectives means that these viewpoints reflect those at a single time point in training. A small proportion of

Fig. 2 Odds of Choosing Certain type of Career According to the Four Viewpoints Derived from the Q-sort Activity. **A** Odds ratios (OR) for choosing a sub-specialty career; **B** OR for choosing an inpatient-based career; and **C** OR for choosing a "high compensation" career. The referent group is the "Unaffiliated" group of residents who did not load into any of the four factors
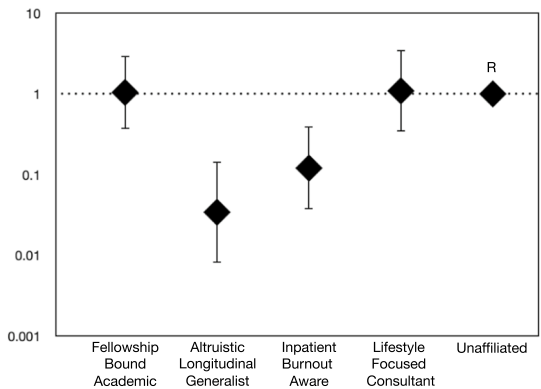
A Odds (OR) of Choosing Sub-Specialty Training According to the Four Viewpoints Identified in the Q Sort Study
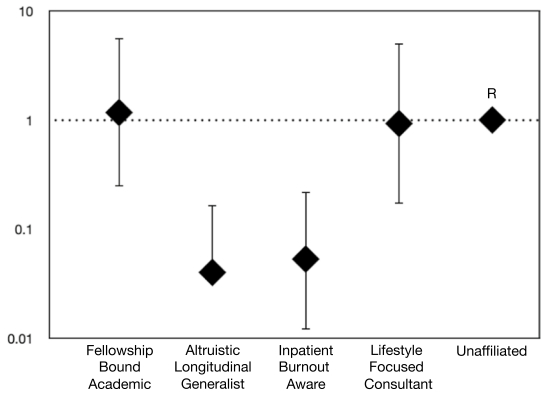
B Odds (OR) of Choosing an Inpatient-Based Career According to the Four Viewpoints Identified in the Q Sort Study
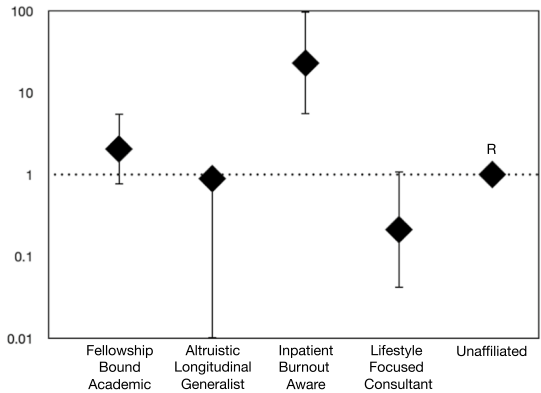
C Odds (OR) of Choosing a High Compensation Career According to the Four Viewpoints Identified in the Q Sort Study

our sample (11%) were first-year residents (PGY-1). It is likely that length of training is correlated with an established professional identity and a more stable Q-sort viewpoint, thus the PGY-1 resident responses may change with time (West et al., 2006; Yang et al., 2020). Therefore, our study targeted residents in the PGY-2 level or above, a time point when residents are nearing completion of their training, attitudes are solidified, and career decisions are finalized. Second, the statement set itself could introduce systematic bias if the statements are ambiguously or extremely worded. However, use of a forced distribution mitigates against this. Third, response bias could exist if participants perceived certain responses as more socially acceptable rather than true to their subjective experience. Fourth, our study included only US IM trainees, so the results may be less generalizable to trainees in other countries. Finally, it is worth noting that the defining statements for each viewpoint represent attitudes that are intercorrelated, and we cannot make conclusions about causation or sequencing of attitude development.

Values, attitudes, and lived experiences are all involved in the complex processes that are professional identity formation and career selection. In a contemporary cohort of IM trainees, we identified four dominant types of residents through the lens of professional identity and career choice decisions. For better or worse, a substantial number of US physicians are making these decisions in accordance with the viewpoints we identified through by-person factor analysis. Knowledge of these viewpoints can inform discussions and policy decisions designed to balance the desires of the individual, the goals of the training program, and the needs of our patients and their communities.

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