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The MD/MBA Effect:
A study of how residency directors perceive applicants with an MBA, a ten-year
comparison study from 2006 to 2016

A Thesis Submitted to the
Yale University School of Medicine
in Partial Fulfillment of the Requirements for the
Degree of Doctor of Medicine

by

Jay Pravin Patel

2017

Title: The MD/MBA Effect: A study of how residency directors perceive applicants with an MBA

Author: Jay Pravin Patel

Abstract:

Background: Over the past decade, the landscape of healthcare has changed dramatically, demanding the close integration of business and management with the delivery of clinical care. In response, there has been a continuation of the trend towards additional training for physicians through an MBA program that has been seen over the last thirty years. However, some medical students have encountered some negative perceptions voiced by senior physicians about MD/MBA training. As most MD/MBA joint-degree candidates consider clinical careers, it is vital to understand the views of residency program directors who hold the gates to graduate medical education.

Purpose: Therefore in this paper, we will investigate the following hypotheses: Completing an MBA as a medical student will be perceived positively by residency directors, and the global opinion of MD/MBA candidates has changed over the last decade.

Methods: An electronic survey was sent to residency directors in most major specialties across the United States to ascertain their opinions of MD/MBA residency candidates. A Likert score was tabulated corresponding to the level of MBA-favorability of each program. Statistical correlations were performed based on medical specialty, demographics, geographical region, the experience of the program director with an MBA curriculum, faculty with an MBA, or residents with an MBA. Data were compared with a similar survey by Lyssy et al performed in 2006.

Results: 578 residency program directors responded to our survey, a response rate of 22.2%. No statistically significant difference was found in the calculated Likert score of MBA candidate favorability across the medical specialties. A statistically significant difference in the proportion of program directors with interactions with faculty and residents with an MBA was found among the medical specialties; however, no statistically significant difference in the proportion of program directors who personally hold an MBA was found. Program directors who had direct experience working with residents with an MBA reported higher Likert positivity scores compared to those who did not. Additionally, departments with a higher number of faculty with an MBA were positively correlated with a greater number of residents with an MBA in that program. Residency program director age was negatively correlated with the Likert MBA candidate favorability score. Compared to the 2006 dataset, there were minimal changes in the Likert-type question scores in 2016.

Conclusions: Residency directors across multiple specialties positivity regard MD/MBA candidates and the candidates' training for their residency programs. Moreover, this regard has remained generally stable over the past decade.

Acknowledgements

In memory of Dr. Vivien Casagrande (1942-2017) for her personal and professional mentorship in developing my skills in scientific investigation; special thanks to Dr. Howard Forman for supporting and guiding my interest to understand the management and delivery of healthcare; gratitude to the numerous physicians at Yale who have inspired me to lead a life in service of others; and love to my family who encourage me to embody my best self.

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Introduction

Over the last decade, the landscape of healthcare has changed dramatically with the introduction of the Patient Protection and Affordable Care Act (PPACA) and the Medicare Access and CHIP Reauthorization Act of 2015 (MACRA). This movement from fee-for-service toward pay-for-performance and managed care has challenged healthcare systems to reevaluate their models to ensure sustainability. In 2015, the United States spent 17.8% of its GDP on healthcare (1). As multiple stakeholders, such as government agencies, shareholders, corporations, and private individuals, are advocating for their interests - it has become increasingly difficult to separate the clinical encounter from the overall delivery of health services.

As the medical profession lay at the center of this reform, senior physicians have reiterated the necessity of the physician trained in medicine and management through formal MD/MBA degree programs. However, this movement is not new. More than thirty years ago, many physicians recognized that “the demand for physician-executives is apparent and growing.”(2) Many believed that physician leaders could take positions within “academic administration, department management, corporate medicine, large group practice, health maintenance organizations and preferred provider organizations, independent practice associations, and the like”(2). Other physicians believed that “physician-executives can bring a legitimate authority to healthcare ...”(3) and viewed the “bilingual” MD/MBA’s role “to make the best decisions about utilization of health-care resources [over] their business trained colleagues.”(4)

However, not all reactions to MD/MBA training have been positive. Medicine has traditionally been viewed as a nearly spiritual and selfless profession, akin to serving

within the Church or in public service. Therefore, the education of the young physician in the cold subjects of economics, finance, and operations may be perceived in negative terms. For example, one MD/MBA student noted, "...Some people think it is sort of a sell-out or that we are going to the other side of the camp". Another student received similar comments: "one physician called me a traitor because he said I couldn't have both business and patient interests in mind at once."⁽⁵⁾

This negative perception of MD/MBA candidates is concerning for medical education programs. Data reveal that more than 77% of joint degree MD/MBA students express an interest in clinical practice⁽⁶⁾, and moreover, there has been rapid growth in the number of joint-degree programs in the United States over the past two decades. In 1993, six such programs were offered, while in 2013, 65 MD/MBA programs were active^(7, 8). Therefore, one may deduce that increasing numbers of MD/MBA joint-degree candidates will be applying for medical residencies.

Graduate medical education is completed in a form traditionally known as a "residency". In this additional training, graduated medical students work under the direct supervision of physician educators to develop and practice skills within a specific branch of medicine in order to be eligible for "board certification". The residency program director is tasked with selecting residents who will both care for the institution's patients and carry forth the legacy of that program. Therefore, the criteria by which residency directors select candidates has been the subject of multiple studies. Such factors have included the following: the interview, score on the United States Medical Licensing Exam part I, electives taken during senior year of medical school, completion of a rotation at the director's program, deans' letters, and grades in required clerkships⁽⁹⁻¹⁴⁾.

Nevertheless, one research group concluded, “Residency selection is a relatively subjective, unstandardized process...”(14).

Therefore, given the multifactorial and unstructured selection process by the gatekeepers of additional clinical training, it is vital to understand how medical residency directors perceive MD/MBA candidates. This research is especially important given the anecdotal negative sentiment encountered by some medical students. The insight gained by this study may be used to train future MD/MBA joint-degree students for specific challenges facing their medical career, and this information may be used to address any potential extrinsic issues before students enter into the residency match program. Therefore, in this paper, we present the results of a national survey of residency directors and their perceptions of MD/MBA joint-degree students as candidates for graduate medical education.

Purpose

The major objective of this thesis is to test whether completion of an MBA as a medical student will be perceived positively by residency directors and whether the global opinion of MD/MBA candidates has changed over the last decade (15). Additionally, this thesis will correlate these attitudes with the demographics of the program directors, their familiarity with the MBA curriculum, and their interactions with individuals who hold an MBA. This thesis's goal is to inform the medical education community, as well as MD/MBA candidates, about potential challenges in entering graduate medical education and subsequently to tailor MD/MBA undergraduate medical education programs to preemptively address these concerns.

Methods:

We consulted with the Association of American Medical Colleges, AAMC, to determine the various residency tracks available to senior medical student applicants. From this list, we narrowed our scope to selected specialties with greater than 8,000 physicians in the United States to allow the greatest generalizability of our research findings. The specialties included in our study, in alphabetical order, comprised of anesthesiology, dermatology, family medicine, general surgery, internal medicine, neurology, obstetrics & gynecology, ophthalmology, orthopedic surgery, pathology, pediatrics, physical medicine & rehabilitation, plastic surgery, psychiatry, diagnostic radiology, and urology. Unfortunately, otolaryngology was not included in our survey due to database import error. After identifying our target specialties, we queried the Accreditation Council for Graduate Medical Education, ACGME, for a list of residency training programs located within the United States along with contact information for each respective program director. We conducted an internet search engine query (Google) for contact information when ACGME information was incomplete; if this failed to yield results, the contact for an administrative assistant for the program director or general administration was utilized.

The survey form, attached, was based on the prior work of Dr. Doug Lyssy. The form was designed incorporating the input of several faculty at the Yale School of Medicine to ensure the use of non-offensive semantics and opportunities for free-form response. The form was preceded by a disclosure statement, approved by the Human Research Protection Program, which stated survey responses would be collected

anonymously and a small monetary donation would be made to a list of selected charities at the end of the survey form for the subject's participation.

The survey form was designed in three main sections: program information, residency director demographics, and attitudes towards MD/MBA residency candidates. General information included age, gender, residency program state, and residency program category. Questions about the program directors' opinions on MD/MBA candidates were surveyed using Likert-type questions. Program directors were also asked about their interactions with residents who possess an MBA, faculty who possess an MBA, and their own experience with an MBA program.

In order to ensure anonymity, facilitate tabulation, and reduce budgetary outlay for distribution of the survey tool, we selected a commercial survey vendor (Qualtrics – Provo, Utah) to email our subjects utilizing an anonymized e-mail link. Two weeks were allowed for an initial response from each residency director; if a completed response was not marked by the vendor, two additional follow-up emails were sent with two weeks between each mailing. Each email contained a customized heading with the program director's name, a body outlining the goals of the anonymous survey, and an option to unsubscribe from any future emails.

Collected data was analyzed by calculating a Likert score, as an overall measure of MBA favorability, by summing the responses to questions 1 through 6, where 1= "Strongly Disagree", 2= "Somewhat Disagree", 3= "No Opinion", 4= "Somewhat Agree", and 5= "Strongly Agree". Scores were reversed for questions 3 and 4. The Likert score ranged from a possible minimum of 6 to a maximum of 30, where a higher

score indicated a more favorable opinion of MBA candidates. Near the end of the survey, an option was given to provide additional free text commentary. Comments were coded into positive, indifferent, or negative sentiment and content theme categories.

All statistical analyses, including frequencies, t-tests, and analysis of variance with corresponding 95% confidence intervals, were obtained with Statistical Package for the Social Sciences(16). Statistics were calculated based on all available data, including partially completed surveys. However, if one Likert-type question was incomplete, the Likert score for that individual was not compiled.

Results

Overall, 2,771 residency directors with functioning email addresses were identified, of which 22.2% responded to our survey. The total surveyed by gender and average age of each program director by program type are presented in Table 1. Men represented 68.34% of all respondents and females represented 31.66%. All responding program directors in orthopedic surgery and plastic surgery were males.

Table 1: Baseline Characteristics of Residency Directors

Program	Male		Female		Mean Age yrs
	<i>n</i>	%	<i>n</i>	%	
Anesthesiology	31	73.80%	11	26.20%	51.02
Dermatology	12	48.00%	13	52.00%	50.24
Family Medicine	41	59.40%	28	40.60%	51.16
General Surgery	38	84.40%	7	15.60%	53.3
Internal Medicine	37	68.50%	17	31.50%	52.11
Neurology	19	76.00%	6	24.00%	44.96
Obstetrics & Gynecology	20	41.70%	28	58.30%	51.52
Ophthalmology	23	85.20%	4	14.80%	46.59
Orthopedic Surgery	32	100.00%	0	0.00%	49.94
Pathology	17	58.60%	12	41.40%	55.38
Pediatrics	27	64.30%	15	35.70%	48.98
Physical Medicine & Rehabilitation	8	53.30%	7	46.70%	49.53
Plastic Surgery	22	100.00%	0	0.00%	54.17
Psychiatry	18	52.90%	16	47.10%	52.76
Radiology - Diagnostic	24	64.90%	13	35.10%	49.79
Urology	26	81.30%	6	18.80%	51.94
Total	395	68.34%	183	31.66%	51.01

The program directors' personal experience with an MBA curriculum, with faculty who hold an MBA, or with residents who hold an MBA is presented in Tables 2a, 2b, and 2c. The greatest percentage of program directors who hold an MBA was found in

anesthesiology (14.3%), family medicine (10.1%), and physical medicine & rehabilitation (6.7%). The greatest percentage of program directors who have at least one department faculty with an MBA was found in anesthesiology (81.0%), diagnostic radiology (73.7%), and pediatrics (70.7%). The program directors who answered “Yes” to having worked with residents with an MBA was greatest in anesthesiology (83.3%), internal medicine (68.5%), and diagnostic radiology (65.8%). There was no statistical difference in the rate of program directors with an MBA in any group ($p=.226$), while there was a statistically significant difference in the rate of program directors with faculty with an MBA ($p=.000$), and in the rate of program directors who have worked with residents who have an MBA ($p=.000$).

Table 2a: Program Director interface with an MBA curriculum

Program	Program Director w/ MBA			
	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Anesthesiology	6	14.3%	36	85.7%
Dermatology	0	0.0%	25	100.0%
Family Medicine	7	10.1%	62	89.9%
General Surgery	2	4.4%	43	95.6%
Internal Medicine	2	3.7%	52	96.3%
Neurology	1	4.2%	23	95.8%
Obstetrics & Gynecology	1	2.1%	47	97.9%
Ophthalmology	1	3.7%	26	96.3%
Orthopedic Surgery	1	3.1%	31	96.9%
Pathology	1	3.4%	28	96.6%
Pediatrics	0	0.0%	42	100.0%
Physical Medicine & Rehabilitation	1	6.7%	14	93.3%
Plastic Surgery	0	0.0%	23	100.0%
Psychiatry	2	5.7%	33	94.3%
Radiology - Diagnostic	2	5.3%	36	94.7%
Urology	1	3.1%	31	96.9%
Total	28	4.8%	552	95.2%
	$p=.226$			

Table 2b: Program Director interface with peers who hold an MBA

Program	Any faculty w/ MBA			
	Yes		No	
	<i>n</i>	%	<i>n</i>	%
Anesthesiology	34	81.0%	8	19.0%
Dermatology	5	20.0%	20	80.0%
Family Medicine	16	23.2%	53	76.8%
General Surgery	29	64.4%	16	35.6%
Internal Medicine	33	62.3%	20	37.7%
Neurology	5	20.0%	20	80.0%
Obstetrics & Gynecology	22	45.8%	26	54.2%
Ophthalmology	14	51.9%	13	48.1%
Orthopedic Surgery	18	56.3%	14	43.8%
Pathology	12	41.4%	17	58.6%
Pediatrics	29	70.7%	12	29.3%
Physical Medicine & Rehabilitation	3	20.0%	12	80.0%
Plastic Surgery	10	43.5%	13	56.5%
Psychiatry	12	34.3%	23	65.7%
Radiology - Diagnostic	28	73.7%	10	26.3%
Urology	8	25.8%	23	74.2%
Total	278	48.1%	300	51.9%
	<i>p</i> = .000			

Table 2c: Program Director interface with residents who hold an MBA

Program	Worked with any residents w/ MBA					
	Yes		Maybe		No	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Anesthesiology	35	83.3%	3	7.1%	4	9.5%
Dermatology	11	44.0%	1	4.0%	13	52.0%
Family Medicine	27	39.7%	7	10.3%	34	50.0%
General Surgery	20	44.4%	2	4.4%	23	51.1%
Internal Medicine	37	68.5%	4	7.4%	13	24.1%
Neurology	4	16.0%	2	8.0%	19	76.0%
Obstetrics & Gynecology	13	27.1%	1	2.1%	34	70.8%
Ophthalmology	14	51.9%	1	3.7%	12	44.4%
Orthopedic Surgery	19	59.4%	0	0.0%	13	40.6%
Pathology	9	31.0%	1	3.4%	19	65.5%
Pediatrics	14	33.3%	4	9.5%	24	57.1%
Physical Medicine & Rehabilitation	7	46.7%	1	6.7%	7	46.7%
Plastic Surgery	13	56.5%	0	0.0%	10	43.5%

Psychiatry	19	54.3%	2	5.7%	14	40.0%
Radiology - Diagnostic	25	65.8%	1	2.6%	12	31.6%
Urology	10	30.3%	2	6.1%	21	63.6%
Total	277	47.7%	32	5.5%	272	46.8%
<i>p</i> =.000						

The calculated Likert score of MBA candidate positivity by residency director specialty is presented in Table 3. The range was from 8 to 30. The overall mean score was 22.89, and there was no statistically significant difference across any specialty ($p=.468$). Moreover, there was no statistically significant difference across gender ($p=.81$) or by United States region ($p=.288$), as seen in Table 4.

Table 3: Likert Score of MBA Candidate Positivity by Residency Director Specialty

Program	n	Mean	Std. Error
Anesthesiology	41	23.90	.56
Dermatology	25	22.40	.57
Family Medicine	69	23.10	.39
General Surgery	45	22.38	.58
Internal Medicine	54	21.98	.47
Neurology	23	23.22	.80
Obstetrics & Gynecology	47	22.81	.54
Ophthalmology	27	22.56	.53
Orthopedic Surgery	32	23.28	.74
Pathology	29	23.03	.73
Pediatrics	39	23.00	.57
Physical Medicine & Rehabilitation	15	22.13	.82
Plastic Surgery	22	22.45	.75
Psychiatry	35	22.51	.72
Radiology - Diagnostic	38	24.13	.59
Urology	33	22.82	.72
Total	574	22.89	.15
<i>p</i> =.468			

Table 4: Likert Score of MBA Candidate Positivity by Gender and Region

Gender	n	Mean	Std. Error
Male	392	22.85	.19
Female	179	22.93	.25
<i>p</i> =.81			
Region			
West	85	23.28	.42
Midwest	139	22.7	.29
Northeast	160	22.57	.27
South	177	23.18	.29
<i>p</i> =.288			

As seen in Table 5, Likert scores were not statistically significantly correlated with whether the program director possessed an MBA ($p=.237$) or if any department faculty possessed an MBA ($p=.076$). However, there was a statistically significant greater mean Likert score reported by program directors who have worked with residents that have an MBA versus program directors who do not report such interaction ($p=.024$).

Table 5: Likert Score of MBA Candidate Positivity by MBA interactions

	n	Mean	Std. Error
Program Director w/ MBA	28	23.68	.71
Program Director w/o MBA	546	22.84	.16
<i>p</i> =.237			
Any faculty w/ MBA	274	23.18	.20
No faculty w/ MBA	298	22.64	.22
<i>p</i> =.076			
Worked with MBA residents – Yes*	276	23.28	.22
Worked with MBA residents – Maybe	32	22.03	.59
Worked with MBA residents – No*	267	22.57	.22
<i>p</i> =.032 <i>*p</i> =.024 LSD post-hoc test			

Program director age was found to have a statistically significant, mild negative correlation to the MBA favorability Likert score ($p=.001$), as seen in Table 6. Moreover,

the number of MBA holding department faculty was statistically significantly positively correlated to the number of MBA holding residents who matriculated through that residency program.

Table 6: Correlation of Program Director Age, MBA Faculty, MBA Residents, and Likert Score of MBA Favorability

		Program Director Age	# of MBA Faculty in Department	# of MBA Residents through program	Likert MBA Favorability score
Program Director Age	Pearson Correlation	1	-.038	-.070	-.135**
	Sig. (2-tailed)		.549	.251	.001
	N	578	246	267	570
# of MBA Faculty in Department	Pearson Correlation	-.038	1	.342**	.056
	Sig. (2-tailed)	.549		.000	.383
	N	246	248	149	245
# of MBA Residents through program	Pearson Correlation	-.070	.342**	1	.052
	Sig. (2-tailed)	.251	.000		.399
	N	267	149	268	267
Likert MBA Candidate Positivity score	Pearson Correlation	-.135**	.056	.052	1
	Sig. (2-tailed)	.001	.383	.399	
	N	570	245	267	576

**Correlation is significant at the 0.01 level (2-tailed).

Though not recommended by most data analysts for analysis of Likert scales, parametric analysis, analyzing each question independently, was conducted on the study data for completeness. ANOVA testing did not show any statistically significant difference in mean Likert score for questions 1 through 6 at an alpha of 0.05 across all residency specialties surveyed. Therefore, no further posthoc pairwise testing was performed.

Table 7: 10 Year Survey Trend Data, from Lyssy 2009

	Year	Combined	Radiology-Diagnostic	Internal Medicine	General Surgery	Orthopedic Surgery
Sample Size	2006	244	59	76	65	44
	2016	168	37	54	45	32
Male/Female	2006	198/44	39/18	59/17	57/8	43/1
	2016	131/37	24/13	37/17	38/7	32/0
% Program Director w/ MBA	2006	14.34%*	20.34%*	14.47%*	12.31%	9.09%
	2016	4.14%*	5.26%*	3.70%*	4.44%	3.13%
% PD Faculty w/ MBA	2006	41.25%	33.33%*	49.33%	53.13%	20.45%*
	2016	64.29%	73.68%*	62.26%	64.44%	56.25%*
% Yes Known MBA Residents	2006	44.26%*	52.54%*	50.00%*	36.92%	34.09%*
	2016	59.76%*	65.79%*	68.52%*	44.44%	59.38%*
Q1 – Presence of MBA	2006	(2.34, 2.53)	(2.09, 2.51)	(2.18, 2.50)	(2.48, 2.87)	(2.25, 2.68)
	2016	(2.21, 2.44)	(1.78, 2.27)	(2.32, 2.72)	(2.08, 2.54)	(2.07, 2.68)
Q2 – MBA Add Value	2006	(2.33, 2.54)	(2.06, 2.48)	(2.20, 2.58)	(2.41, 2.82)	(2.20, 2.75)
	2016	(2.15, 2.42)	(1.62, 2.17)	(2.16, 2.58)	(2.13, 2.67)	(2.10, 2.78)
Q3 – Not Complete Program	2006	(3.71, 4.00)	(3.79, 4.31)	(3.76, 4.27)	(2.94, 3.55)	(3.94, 4.52)
	2016	(3.71, 4.04)	(3.77, 4.34)	(3.60, 4.18)	(3.31, 3.98)	(3.53, 4.40)
Q4 – Not Practice Clinically	2006	(3.38, 3.68)	(3.20, 3.83)	(3.43, 3.96)	(2.80, 3.39)	(3.66, 4.21)
	2016	(3.22, 3.56)	(3.20, 3.85)	(2.84, 3.46)	(3.00, 3.71)	(3.24, 4.13)
Q5 – MBA Useful to Field	2006	(2.11, 2.36)*	(1.63, 2.06)	(2.01, 2.45)	(2.47, 2.98)*	(1.79, 2.30)
	2016	(1.83, 2.06)*	(1.55, 2.03)	(1.93, 2.33)	(1.73, 2.19)*	(1.50, 2.07)
Q6 – Use more MBAs	2006	(1.94, 2.19)	(1.62, 2.11)	(1.81, 2.22)	(2.18, 2.74)	(1.59, 2.10)
	2016	(1.77, 2.03)	(1.41, 2.07)	(1.85, 2.23)	(1.69, 2.22)	(1.45, 2.11)

***indicates p<.05 for comparison from 2006 to 2016 of corresponding column field. Data formatted to match prior data source.**

Table 7 presents survey data collected by Lyssy in December 2006-February 2007 compared to the data collected in this survey. The total surveyed sample was larger in this survey of 578 respondents, but when compared to the four specialties surveyed by Lyssy, the sample was smaller, 168 versus 244 respondents. Statistical tests were performed on whether the program director possessed an MBA, knew faculty with an MBA, or was familiar with residents with an MBA. Of these tests, a statistically significant lower percentage of program directors with an MBA were found overall, within diagnostic radiology, and internal medicine when comparing 2016 data versus 2006 data. More program directors knew faculty with an MBA in diagnostic radiology

and orthopedic surgery, with a statically significant difference in percentages reported in 2016 versus 2006. More program directors were familiar with at least one resident with an MBA degree overall, within diagnostic radiology, internal medicine, and orthopedic surgery in 2016 versus 2006. Finally, program directors aggregated in general surgery reported a statistically significant decrease in MBAs' usefulness to the field in 2016 versus 2006.

The top five free-response comment themes in the 2016 survey, with representative comments, are presented in Table 8. The top six themes were business, administrative, and management skills; candidate's MBA goals; unlikely clinical practice; poor candidate; motivation; and leadership. Comments have only been modified for publication utilizing ellipsis.

Table 8: 2016 Selected Free Response Comments

Business, Administration, Management Skills
Good training for systems-based practice competencies and to provide leadership for resident quality improvement and patient safety projects.
With the current healthcare climate, practitioners with the perspective gained from earning an MBA should help us make smart decisions regarding finding new revenue streams, positioning our organizations for growth in the short and long term future, and navigating the changing medical landscape. I think an MBA is potentially a big plus.
I am the only faculty member with an MBA. I got my MBA (executive program) when I was chair of a department (at another institution). I has been extremely useful in giving me the knowledge and skills to assess my department's and institution's (past and present) administrative, operational, financial and cultural strengths and weakness. This has guided me well in making career decisions, counselling residents regarding career and other decisions, and in giving me the knowledge to persuade others in strategic and tactical planning. Every academic chairperson and institutional administrator could benefit from an MBA.
I agree doctors need to know more about the business side of things in order to have a strong voice going forward in discussions about improving healthcare. While I wish we all worked in a single payer system, we don't. We work in a complex industry and need to understand all the drivers. If we are ignorant of these issues, we will not be well-represented at the table where important

decisions about value, productivity and systems refinements are made. Consequently, I am all for people entering residency with an extra business-related knowledge base. [...]

The MBA offers trainees the assets of a different knowledge base and problem solving skills. These are important for us to foster among our trainees as they need to master competencies in systems based practice. Having residents in a program with well developed skills and knowledge for facing and solving challenges related to just distribution of limited resources, processes & workflow, health care financing will predictably be a great asset. There is more to learn than differential diagnoses, finding recognition, and how to write a good radiology report.

Candidate's MBA Goals

How they plan to use it is the biggest question. Just having the degree is a CV builder. What it actually means is a different story. I don't think we always have a clear notion on how this degree would help.

Each applicant is assessed individually. Some MD/MBA candidates seem like the MBA is the most relevant portion of their education for their career goals while others choose to integrate it into their clinical practice of medicine. I have no bias for or against MD/MBA applicants because it seems that there is a wide variety of reasons to obtain the degree that differently effect their candidacy. Likely, this is a reflection of the individual rather than the degree.

I'd be interested in how the resident plans to use the MBA professionally. I'd be reluctant to recruit someone who wanted to use the MBA to become a consultant to industry, but I think many of the skills acquired through an MBA are applicable to efforts to improve healthcare delivery.

Many medical students have NO CLUE what they are going to do with the MBA. Some believe that it is a pathway to leadership, chief, chair, etc; but they have no idea what it means. [...]

Typically I want to know how the applicant sees the MBA adding to their intended career. The time and devotion required to complete an MBA speaks to the applicants potential in training - however there is always a concern the path to the MBA was used as a end in the applicant's life in which case I worry this would speak more to someone who is not driven to attain one goal.

Unlikely Clinical Practice

Often come to residency with a different focus that can be good or bad, depending on the individual. This is hard to answer since can be a positive in some cases, or negative in others (those who really are not as investing in patients or residency). We do need more physician leadership, but not those who jump to industry and often do not make sig. positive contributions.

Sometimes people that do not like clinical medicine during medical school get an MBA to add a skill so that they can use their MD degree in a nonclinical way and therefore not have to practice clinical medicine These people tend to be very unhappy during residency because of the heavy clinical load and emphasis on clinical skills development, which they have no plan on using, and therefore don't see why they need to work on these skills. This unhappiness makes my job harder

as they tend to not do as well, bring down the morale of fellow residents, bring down morale of attending teachers, and work at ways to get out of clinical work they dislike.

Also, sometimes people who went into medicine because they saw it as a good way to make money (as opposed to going into medicine as a good way to help people) will get an MBA because they plan to run a medical practice like a business and want this skill. In our field, I would prefer to attract residents who are more altruistic.

[...]On the flip side, the point of residency is to learn how to take care of patients. I have met a number of people with business degrees trying to enter residency who don't seem to have a lot of interest in patient care. This is unfortunate. Credibility in our line of work comes from knowing and doing the day job. So in my mind, the perfect MD/MBA is someone fully engaged in the MD with the MBA as an offshoot, not the other way round.

My primary concern is to train physicians who wish to remain in the state and practice medicine. My concern would be this individual is not interested in clinical medicine.

I seek a variety of applicants. Having 1-2 in the program with an MBA is fine, but more than that, I don't think is helpful. Also, there are times where I have interviewed MD-MBA applicants and it is clear that they really are not interested in doing clinical work. This is a problem for residency programs so just having an MBA is not as critical as developing these sorts of skills in all radiologists.

Poor Candidate

Very helpful training, but I have yet to see an applicant meeting our minimum qualifications for an interview that also possessed a MBA.

I agree that this resident has potential to bring a lot to our program (and many have). However some our residents with the most difficulty meeting our clinical expectations have been those with MBA. I think there is a gamble here- is this resident truly interested

Sometime students do an MBA and it is clearly because they did not get into medical school the first time around, and they needed to do something useful and bolster their application. For some applicants who are clearly interested in health services or other epi research, they use it, for most of them, it was an extra thing to do, and does not add anything to their application, and may be a red flag, for reason noted above.

many of the applicants that I have interviewed that have an MBA coming out of medical school were actually academically challenged in the medical school aspects and were not the best applicants as their USMLEs were not as good and they didn't have as good of an application. So actually at this point, it is kind of a red flag to me. And it hasn't been so much that their medical school grades suffered due to the MBA course work, they were not as good on their own.

When students complete their MBA within the four year medical school curriculum I'm concerned that it takes away from the time they dedicate to

improving their medical knowledge. When looking at our applicants the ones with an MBA seem to have lower STEP 1 / COMLEX 1 scores.
Motivation
Usually a sign of motivation, since it is generally accomplished in concert with their other training. They bring a knowledge base that others do not have.
Likely to be a more self motivated individual and one who has life/work experience outside of medicine, which are desirable characteristics.
It is mostly an indicator of the ability to commit to and do advanced work. It is neither a plus nor minus when applying to our residency.
Having an MBA would be a positive in the application process- shows diversity and dedication to add extra time to the MD program. I am not sure it would be of much benefit during residency itself, as residency is mostly clinical. I again think it becomes useful post residency
Intelligence, drive, ambition, forward thinking.
Leadership
There are numerous leadership positions that have opened up for Family Medicine physicians, particularly with regard to the value based care models and ACOs. I think that this is a more useful degree now for Family Medicine physicians than it has been in the past.
The ability to think like an administrator, even for someone who is entirely clinically oriented, helps with communication. It also addresses the skill set required for physician leadership positions.
Good training for systems-based practice competencies and to provide leadership for resident quality improvement and patient safety projects.
MBA applicants typically have had some formal leadership training and quality improvement training as well as a better understanding of system-based issues. I have found this to be helpful in our program in leading teams as a senior resident and conducting QI projects.
Better leadership skills Better understanding of QI

Table 9: 2006 Selected Free Response Comments by Lyssy

Uncategorized Quotations from Lyssy (15)
We have come to a time where those that make decisions can not identify a patient in a well-lit room, with a map, magnifying glass and seeing-eye-dog.
50% of our residents with MBAs have left the program
The one we have (resident with an MBA) has been evaluated to be the laziest resident they know
Too pragmatic and not "romantic" enough about saving humanity, serving the poor and unwashed, etc. on
I am personally very concerned about young men and women, without getting their hands dirty in the clinical arena for several years, wanting to become medical administrators directly. If! felt that was the intention, I would never

accept them in my program. That is a hidden fear that many Program Directors harbor. We have no use for such theoretical arm chair quarterbacks. It would be a bit like the worthless folk who advised Hilary Clinton on her health care "reform" package which richly deserved the fate it met.

What does an MBA bring to the table? Marketing? Accounting? Management? Finance? If I thought I needed those skills, I would go obtain an MBA. In many ways this is a big distraction to these people from the meat and potatoes of medicine. They tend to become confused because they are so interested in "big picture" items.

Successfully completing an MBA indicates a level of academic ability and organizational skill that should make the recipient an excellent resident

Older age residents may contribute less to the social spirit of the residency training group.

I would be suspicious that they would truly want to practice medicine. I would also have some concern if they would really be willing to put time/effort necessary into residency training.

I am 62 and plan on getting my MBA soon. Our former chair, now Chief Medical Officer; and our chief of Surgery at the VA both have MBA degrees.

I perceive them as energetic, smart and interested in the future of medicine.

I find my residents with multiple degrees are sometimes less compliant with day-to-day administrative requirements of the program (procedure logs, HIPPA compliance modules) because they often feel entitled to decide for themselves which tasks are actually important. With 40 residents, it is difficult to tolerate 40 separate interpretations of department policies

My chairman and one my partners acquired MBA's during a 5 year period of time at a university setting. The effect of the MBA was that both individuals withdrew from education, were obsessive concerned with non clinical matters and avoided clinical work altogether. One has left clinical care.

Having an understanding of the business side of radiology and medicine would enhance any practice. This would likely have positive effects on income. These skills would obviously not make the person a better diagnostic radiologist.

I see no reason why business acumen and compassionate medicine can not coexist. I view an MBA as an added and valuable dimension to the application.

I worry that that type of physician may be an entrepreneur rather than dedicated to medicine.

The applicant has to present him or herself with a cogent plan that includes how the MBA would help them get to the career goals.

In our experience, residents with MBA's are more "financially oriented" than clinically oriented." They have not worked as hard as our other residents nor have they cared for their patients as well. Resident peers have in general viewed them as slackers.

Would hopefully do important research and contribute to solving national problems that plague our specialty

Medicine is a 100 percent commitment. My concern is anyone with an MBA may not be 100% committed to the practice of medicine.

Often distracted from primary duties on orthopedic related issues

Discussion

Senior medical student candidates with an MD/MBA degree are perceived positively by residency program directors of all medical specialties. However, there are certain environments that foster a more positive view of these applicants, and there is a minority of program directors that view the MBA in a negative light.

Recent legislation such as MACRA and the PPACA has created changes in the healthcare landscape that tie the delivery of healthcare with components of population health and payment reform. Over the past two decades, there has been significant interest in cultivating physician leaders to serve in a multitude of new roles, from academic medicine and health maintenance organizations to independent practice associations and corporate governance.

In response to this movement, the number of MD/MBA joint-degree programs has exploded across the United States, resulting in tremendous growth in MD/MBA graduates. Most graduates wish to pursue clinical practice. However, there is a paucity of information on how these graduates are perceived by the gatekeepers of the next step in their medical education.

Overall, all specialties in this study (anesthesiology, dermatology, family medicine, general surgery, internal medicine, neurology, obstetrics & gynecology, ophthalmology, orthopedic surgery, pathology, pediatrics, physical medicine & rehabilitation, plastic surgery, psychiatry, diagnostic radiology, and urology) have a favorable impression of MBA residency candidates, quantified by the calculated Likert score. Moreover, this positive attitude of program directors towards MD/MBA candidates was reflected similarly in both male and female program directors, as well in

all regions of the United States. However, we found a significant negative correlation between program director's age and total Likert score. Further research is needed to clarify why older program directors perceive MD/MBA candidates with more negativity versus younger program directors.

Surprisingly, program directors with an MD/MBA degree did not have a statistically significant greater Likert score compared to program directors without an MD/MBA. Similarly, the departmental presence of at least one MD/MBA faculty did not significantly influence the Likert score. However, program directors who had worked with MD/MBA candidates in their program did report statistically significant higher Likert scores than program directors who had no such experience. We also discovered that program directors with MD/MBAs and those with MD/MBA faculty demonstrate greater positivity towards MD/MBA candidates. However, a statistically significant Likert score may be difficult to observe due to a high baseline of positive sentiment in both groups. Second, experience in working with residents who possess an MBA may help motivate greater positive sentiment among residency directors versus having a more distant connection such as a faculty member with an MBA. This may explain the statistically significant greater Likert score among program directors who have worked with a resident who possesses an MBA versus a resident who does not.

Moreover, we believe that this first-hand experience with residents who possess MBA training can create a positive atmosphere, which encourages additional MD/MBA candidate applicants. Noticeably, this positive feedback loop was demonstrated in the greater number of MD/MBA residents matriculated through programs in which higher numbers of MD/MBA faculty were present. We hypothesize that these institutions may

reflect both a greater level of support towards MD/MBA candidates as well as targeted programs that may interest applicants, offering tracks or distinctions in quality improvement and patient safety.

In a review of comments, some program directors still voice concerns about the goals of the candidate, the likelihood of clinical practice, and the quality of a joint-degree candidate. Others commend MD/MBA candidates on bringing business, administration, and management skills to the field, as well as in demonstrating greater maturity and leadership. In a comparison of the comments voiced by program directors in 2016 versus 2006, similar themes were observed. However, as this was an optional free-response section of the questionnaire which may be biased, we proceeded to compare the Likert-type question scores parametrically in order to discern if there was a shift in perception of the last decade.

Lyssy included four specialties in his 2006 survey – diagnostic radiology, internal medicine, general surgery, and orthopedic surgery. Though the number of program directors sampled across the four representative fields represented in Lyssy's thesis was higher than in this study, we believe that we achieved a more representative sample by utilizing an electronic form through a commercial vendor, versus a mail-in form from the university in Lyssy's study. This would prevent program directors who have an interest in responding, such as those with an MBA, from being over-represented. Such bias may be present in Lyssy's data as the percentage of program directors with an MBA decreased from 14.34% to 4.14% from 2006 to 2016, which may indicate potential oversampling. Nevertheless, generally over the four specialties, as well as in diagnostic radiology, internal medicine, and orthopedic surgery, there was a marked increase of known

residents with an MBA, thus confirming the increased number of MD/MBA candidates over the past decade. Moreover, the number of faculty with an MBA known to the program director significantly increased within internal medicine as well as orthopedic surgery. This may indicate the value of these skill sets in achieving leadership within an academic center in these departments. It is uncertain why general surgery shows no statistically significant increase in the number of program directors with an MBA, known faculty with an MBA, or residents with an MBA. Of interest, it should be noted that women continue to compose a minority of program directors in general surgery and orthopedic surgery and continue to be grossly underrepresented, with no change over the last decade. This question warrants further investigation, but it does not fit the scope of this paper.

Direct comparison of Lyssy's data to our data was attempted; however, the raw data file was not available to perform a calculated Likert score. Therefore a parametric analysis was performed on the Likert-type items questions 1 to 6(17). For comparison, the scores for question 3 and 4 were not reversed. Other than question 5 for diagnostic radiology and general surgery, all other Likert-type scores of questions 1 through 6, as referenced in Table 7, did not demonstrate a significant difference in mean score between 2006 and 2016. Comparison of the confidence intervals between 2006 and 2016 for all four specialties (diagnostic radiology, internal medicine, general surgery) yielded no statistically significant change over the past decade other than for question 5, "Having an MBA would be useful to a physician practicing in your field." This question was significantly more negative for general surgery and subsequently affected the global average, as seeing no other group demonstrated any statistically significant change. It is

uncertain why general surgery has limited growth in physicians with an MBA and believes an MBA is not useful to the general surgery field, while other groups show a positive change. This would be an interesting question to investigate in further studies.

The overall positive perspective of MD/MBA students by residency directors may be reflective of the utility of the MBA within residency programs and the practice environment. Within residency programs, strong leadership has been attributed to successfully transitioning between the role and responsibilities of an intern to that of a resident. This commended skill is now formally taught in residency programs at the Cleveland Clinic, University of Washington, and Massachusetts General Hospital(18). Similarly, residency programs have encouraged the development of MBA-like skills within their residents through tracks and concentrations to innovate house projects in quality improvement and patient safety at their home institution's primary care clinic, hospital wards, or Veteran Affairs Hospital.

Additionally, strong medical leadership has been associated with reduced mortality, fewer admissions, cost savings, and a positive work environment. Therefore, there is special interest on the part of residency programs to cultivate the skills of the MD/MBA physician leader. For example, the Duke Medicine, Management and Leadership Pathway for Residents (MLPR) was created in 2009, "to accelerate the development of critical leadership and management skills in all facets of medicine, including care delivery, research, and education"(19). This program was created in response to addressing how physician-leaders no longer could be "accidental administrators" who "learn on the job", but rather must be carefully cultivated(19).

Furthermore, this utility of skills acquired with MBA training has been reflected in the increased number of senior physicians considering an executive MBA program(20). Eighty-one percent of senior physicians who completed an MBA program after their MD stated their business degree had been very useful or essential to the advancement of their career(21). A general upbeat attitude resounds among these graduates; as one states, “I think it’s a win-win situation for everybody, not only for the individual physician but for the profession as a whole. There’s no question in my mind that if medical professionals aren’t ready to make decisions on health care, other professions will make those decisions for them”. Another states: “We have a good system, but it can still get better. I would really like to be a part of that process”(22).

This study evaluated the perception of residency program directors of MD/MBA candidates utilizing a direct survey methodology. We believed that profiling the number of MD/MBAs in each residency program, approaching interviewed students or interviewers, and polling practicing physicians would prove to be difficult due to unfeasibility, obscuration, and data unavailability surrounding the residency match process. We do acknowledge the limitations of the survey tool. Some limitations may include response bias due to its voluntary nature, thus potentially selecting for overtly positive or negative opinions, selecting for respondents who are affiliated with the MBA curriculum at their home institution, or allowing for respondents other than the program director due to the lack of face to face authentication. We chose not to investigate the opinions of program directors applicable to other advanced degree tracks, such as MD/Ph.D., MD/MPH, or MD/JD programs, due to their divergence from the question at hand as well as the mutual exclusivity of the degree candidates.

In conclusion, we return to our hypothesis, “Completing an MBA as a medical student will be perceived positively by residency directors, and the global opinion of MD/MBA candidates has changed over the last decade.” We conclude that the majority of program directors across multiple specialties positively regard MD/MBA candidates for their residency programs. Moreover, this positive regard has remained generally stable over the past decade. Additionally, we hope that with greater numbers of MD/MBA candidates entering medical practice these attitudes will continue to evolve in a positive fashion. Future directions for study may examine the source of candidates, the MD/MBA programs, or the pathways graduates take after residency in order to validate the perspectives gleaned from program directors in this study.

Figures: Displayed on next page.

Figure 1: 2016 Survey Questionnaire

Residency Director Attitudes about MD/MBA

[IRB Consent Text]

Do you understand the consent above and wish to continue?

- Yes
- No

What program do you direct?

- Anesthesiology
- Dermatology
- Family Medicine
- General Surgery
- Infectious Disease
- Internal Medicine
- Neurology
- Obstetrics & Gynecology
- Ophthalmology
- Orthopedic Surgery
- Otolaryngology
- Pathology
- Pediatrics
- Physical Medicine & Rehabilitation
- Plastic Surgery
- Psychiatry
- Radiology - Diagnostic
- Urology

In what state do you direct your residency program?

- Alabama
- [...]
- Wyoming

What is your age?

_____ Age

Are you male or female?

- Male
- Female

How would you characterize the effect of the presence of an MBA when assessing a medical student applying to your residency program?

- Strongly Positive
- Somewhat Positive
- None
- Somewhat Negative
- Strongly Negative

A resident with an MBA would add value to the program.

- Strongly Agree
- Agree Somewhat
- No Opinion
- Disagree Somewhat
- Strongly Disagree

An important concern is that a resident with an MBA may not complete the program.

- Strongly Agree
- Agree Somewhat
- No Opinion
- Disagree Somewhat
- Strongly Disagree

An important concern is that a resident with an MBA may not practice clinical medicine upon completion of the program.

- Strongly Agree
- Agree Somewhat
- No Opinion
- Disagree Somewhat
- Strongly Disagree

Having an MBA would be useful to a physician practicing in your field.

- Strongly Agree
- Agree Somewhat
- No Opinion
- Disagree Somewhat
- Strongly Disagree

The medical profession could use more leaders with MBA-type training.

- Strongly Agree
- Agree Somewhat
- No Opinion
- Disagree Somewhat
- Strongly Disagree

In the time you have worked closely with the residency program, has it had any residents with an MBA?

- Yes
- Maybe
- No

Do you personally have an MBA?

- Yes
- No

Do any faculty members in your department have an MBA?

- Yes
- No

What other substantial consideration(s) do you see regarding an applicant with an MBA?

How many residents with an MBA has your program had in the last five years?*

How many people in your department have an MBA?*

[Incentive question]

[End of Survey]

*Displayed only if the corresponding preceding statement was answered in the affirmative.

Figure 2: 2006 Survey Questionnaire by Lyssy

Survey:	
<u>Main question:</u>	
Please answer with the number 1 to 5 where: 1 = Strongly Positive / 2 = Somewhat Positive / 3 = None / 4 = Somewhat Negative / 5 = Strongly Negative	
1. How would you characterize the effect of the presence of an MBA when assessing a medical student applying to your residency program?(Please select one of the following)	
Please select 1, 2, 3, 4, or 5 _____	
<u>Statements of reasons to prefer or be concerned about an applicant with an MBA:</u>	
Please answer with the numbers 1 to 5 where: 1 = Strongly Agree, 2 = Agree Somewhat, 3 = No Opinion, 4 = Disagree Somewhat, and 5 = Strongly Disagree	
2. A resident with an MBA would add value to the program.	
Please select 1, 2, 3, 4, or 5 _____	
3. An important concern is that a resident with an MBA may not complete the program.	
Please select 1, 2, 3, 4, or 5 _____	
4. An important concern is that a resident with an MBA may not practice clinical medicine upon completion of the program.	
Please select 1, 2, 3, 4, or 5 _____	
5. Having an MBA would be useful to a physician practicing in your field.	
Please select 1, 2, 3, 4, or 5 _____	
6. The medical profession could use more leaders with MBA-type training.	
Please select 1, 2, 3, 4, or 5 _____	
7. What other substantial consideration(s) do you see regarding an applicant with an MBA?	

<u>Yes/No and short answer questions:</u>	
8. In the time you have worked closely with the residency program has it had any residents with an MBA?	
Choose Yes ___ No ___	If Yes how many? ___
9. Do you currently have an MBA?	
Choose Yes ___ No ___	
10. Do any faculty members in your department have an MBA?	
Choose Yes ___ No ___ If Yes how many? ___	
11. What is your age? ___ Please check whether you are Male ___ Female ___	

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