ORIGINAL RESEARCH

Exploring the Attitudes and Perceptions of Master of Medical Education Graduates Towards Research Publication in Saudi Arabia

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Introduction: Evidence is lacking to identify what encourages students to conduct research and publish. This study aimed to understand the barriers and facilitators of research and publications from Master of Medical Education student research projects as 15–20% have published their research while 75–80% did not.

Methods: This study used qualitative in-depth interviews with 17 graduates from the previous 13 batches of the Master of Medical Education program, Saudi Arabia. In-depth interviews were conducted with participants by face to face and Zoom, using a semi-structured interview guide. The interviews were conducted in English, and the recordings were transcribed verbatim. Next, the interview text was read multiple times to familiarize with the data for thematic analysis, where the text was coded inductively. Themes were generated by identifying patterns in the data and merging similar codes. The data were interpreted within the themes and supported with the most relevant quotations.

Results: We identified four distinct but interrelated themes and the first theme, the importance and advantages of conducting research and its publication, explains the participants need to conduct research and publish it to survive and progress in the academic environment. In the second theme, positive experiences of conducting research and its publication, we identify what participants' positive experiences of the research process entail. In the third theme, challenges to conducting research and its publication, we explore the participants' opinions on the barriers to their efforts to undertake and publish their research. In the last theme, facilitators for conducting research and its publication, we summarize various facilitating factors that participants described as necessary to complete the research process successfully to peer-reviewed publication.

Conclusion: Masters' student researchers, especially those with demanding projects, need to be supported by providing them with critical supervision, an enabling environment, technical support, and guidance at each step of the research process.

Keywords: medical education research, research and publishing, barriers and facilitators, Saudi Arabia

Introduction

The value of research is evident in improving the quality of human life and benefiting society.[1,2] Research has led to lifesaving discoveries over the past century, including vaccines, therapies, drugs, and finding solutions to current problems.[2] Publishing research is a significant contribution to society and academic communities because it provides numerous benefits such as sharing research findings, allowing scholars to network, refining ideas and thoughts, and upgrading knowledge. At the undergraduate level, research publications promote the development of research skills: writing abilities; exposure to the publication process; building connections with scholars and researchers; demonstrating initiative, professionalism, and leadership; and maybe helping to shape career paths. The advantages of publishing research at the postgraduate and academic faculty level include upgrading knowledge, publicity of work, career promotions and stimulating peers to conduct research.[3] Nevertheless, barriers to publishing research still exist. For instance, poor academic writing skills, an over-specific research context, or failure of research to produce any concrete and tangible policy and practice guidelines or recommendations, poor structure.[4,5] Student publication is important in all

fields as it engages and exposes them to real-world work at an early stage.[6] Therefore, preparing a future cadre of clinical researchers and increasing institutional publications require incorporating the research component into medical training programs at both undergraduate and postgraduate levels.[7,8]

The constant need for healthcare professionals to improve their skills, stay up to date on current developments, achieve professional excellence, advance in their careers, fulfill licensing requirements, and impart high-quality medical education to undergraduates to impact overall patient care necessitates research in medical education.[9] The postgraduate medical education programs are one of the programs that prepare healthcare professionals and members of departments in medical and allied health professional schools to conduct research and innovate towards improving curricula and teaching and assessment methods. These programs specifically improve graduates' educational understanding, skills (particularly leadership), and attitudes. Research in this field has witnessed some progress in the past several decades, where it has contributed substantially to understanding the process of learning in the medical field.[8] The awareness of having evidence-based practices to aid in educational decision making in the field of medicine has significantly increased amongst the academic community, which has led to major educational improvements.[8] Currently, research in medical education covers diverse foci of inquiry, including problem-based learning, teaching, and learning, clinical skills training, communication skills training, performance assessment, program and faculty evaluation, patient safety, and professionalism.[3]

Generally, the perception of the importance of scientific research varies among Saudi health professionals as, although most graduates participate in scientific research, many are not aware of the benefits of conducting research, while others lack knowledge of basic research.[10] Several facilitating and challenging factors for Master of Medical Education (MME) graduates to publish their theses have been identified in previous research.[9] Some of the facilitating factors include supportive program environment, time management, available resources, MME foundation coursework, and alignment of thesis with career goals.[9] The challenging factors include institutional factors, personal and professional responsibilities and limitations, burnout, and barriers to completing a research project.[9]

Research training as part of the curricula and training programs has also increased in the past few years. Despite this global awareness about the value of research in the field of medical education, little is known about which factors to target to improve capacity-building.[8] Raising health professionals' competency to conduct independent research and publish it requires further exploration at both the undergraduate and postgraduate levels. This may be achieved through exploring and analyzing various facilitating and challenging factors among different groups of graduates who have either published previously and or among those who have not yet published any research. There are few in-depth studies exploring these factors from the perspective of publication output from these graduates' research, so further inquiry is required. Moreover, little is known about the attitudes of MME graduates toward publishing their research.[8] To our knowledge, studies exploring and evaluating factors in the effectiveness of research training programs within educational programs remain scarce in the Middle East. Therefore, this study aims to explore with MME graduates the factors, perceptions, attitudes, and contexts associated with the progress of their MME research projects and publications. First, to explore facilitating factors and barriers to research and publication; second, to explore the attitudes of MME graduates towards research and publication; and third, to understand contextual factors towards publication among MME graduates.

Methods

Design

The objectives of the study were achieved with a qualitative exploratory method, designed to collect rich data for in-depth analysis, using one-on-one in depth semi-structured interviews with graduates from the first through 13th batches (from 2006 to 2019) of MME at King Saud bin Abdulaziz University for Health Sciences (KSAU-HS) in Saudi Arabia.

Setting

There are three universities in the Kingdom that offer MME programs in which they aim to graduate healthcare professionals who lead research in their parent institutions. The study was conducted at KSAU-HS, Saudi Arabia. KSAU-HS is a large public sector university established in 2005. The university has fourteen colleges spread across three

campuses: Riyadh in the central region, Jeddah in the western region, and Al-Ahsa in the eastern region. The university provides both undergraduate and postgraduate programs. The MME program was first introduced in the academic year 2006–2007 by the Department of Medical Education in the College of Medicine. About 262 MME students, almost all healthcare providers with a prior bachelor's degree, have successfully graduated since the program's inception. They have diverse backgrounds, and most graduates are doctors, dentists, nurses, pharmacists and specialists from respiratory and radiology fields. Thirteen batches have graduated from the MME program so far, and each batch has around 20 students. The intention was to include MME graduates from all three campuses: Riyadh, Jeddah, and Al-Ahsa. So far, around 40 to 52 from the total 262 graduates have published their research projects which account for only 15–20%. The remaining 197 to 210 graduates did not publish their research projects yet, which account for 75–80%.

Study Population and Sample

The potential participants were all accessible MME graduates regardless of their publication status. All received an e-mailed invitation requesting their participation in the study. Graduates who replied to agree to participate in the study were included. We applied maximum variation sampling, where we included males, females, and those with or without publications, from all three campuses, and from all thirteen batches, however we prioritized MME students who had previously published their research projects, because they were much fewer compared with those yet to publish their research. The sample size depended on the data saturation reached during the interviews. A purposive sampling technique was used to select the participants for individual interviews. This sampling technique enabled the researchers to interview the most useful participants to address the aim of the study. (Table 1).

Data Collection

The interviews were conducted using an open-ended, semi-structured interview guide developed after the review of the relevant literature. The interview guide included both general and specific questions designed to encourage participants to reflect on their experiences and to give detailed opinions. The questions explored six domains: demographic data, attitudes towards research and publication, contextual factors and research skills, institutional services, thesis defense and facilitating factors and barriers to publish. The interviews were conducted individually in English and all interviews were audio-recorded. The interviews were stopped when the research team reviewed the audio-recordings and confirmed that data saturation had been reached. The interviews were conducted individually face to face with 12 participants and online by Zoom with five participants. The interviews lasted from 40 to 60 minutes. The recordings were checked by two members of the research team for accuracy and completeness.

Data Analysis

Interview recordings were transcribed verbatim by NA. NVIVO (QSR international) version 12 was used to code the data, and a qualitative researcher (JA) read the interview text in consultation with the co-authors SA and NM and assisted in data analysis. Coding was mostly performed inductively, where the text was first read and re-read to familiarize with the overall data and then given the most relevant and appropriate codes, summarizing the meaning of the participant expressions in sentences and lines. This was followed by logical editing of code names. Next, the codes explaining a common pattern in the data were aligned under candidate themes. The themes were finalized, and the coded data with code names and participant references were exported to a word document and the text was read again for potential inconsistencies in coding or theme assignment (theme review) before interpretation and editing was performed to generate a report. The thematic analysis steps prescribed by Braun and Clarke (2014) informed our analysis process and theme generation.[11]

Findings

The study had a total of 10 males and 7 females. There was a total of 5 published participants all of which were males from Riyadh. The non-published participants were 7, 6 females (4 from Riyadh and 2 from Jeddah) and 1 male from Jeddah. The remaining five participants had submitted their papers to peer-reviewed journals and were awaiting journal decisions. Most of the participants were from batch 11. There were 13 participants from Riyadh, 3 from Al Ahsa, and 1 from Jeddah. We

Table 1 Characteristics of the Participants in the Study

	Gender	Time to Graduate	Previous Academic Publication	Highest Qualification When Entering Master of Medical Education (MME)	Current Position	Total Number of Other Academic Publications	Most Recent Publication	Working on Another Publication While Enrolled in MME	MME Project Published or Not
1.	Male	2	Yes	PhD	Asst. Prof.	20	–	Yes	Yes
2.	Male	2	Yes	Bachelor	Associate Prof.	–	–	–	Submitted only
3.	Male	2	Yes	Consultant	Professor	–	–	–	Yes
4.	Male	3		PhD	Asst. Prof.	–	–	–	Submitted only
5.	Female	3	Yes	PhD	Asst. Prof.	–	–	–	No
6.	Female	2	Yes	PhD	Asst. Prof.	–	–	–	No
7.	Male	2	Yes	MBBS	Asst. Prof.	–	–	–	Yes
8.	Female	2	Yes	PhD	Asst. Prof.	3	2011	No	No
9.	Female	2	Yes	PhD	Asst. Prof.	4	2016	Yes	Submitted only
10.	Female	2	Yes	PhD	Asst. Prof.	5	2018	No	No
11.	Male	2	Yes	PhD	Asst. Prof.	15	2021	No	Yes
12.	Male	2	Yes	PhD	Associate Prof.	19	2021	Yes	Yes
13.	Female	2	No	Consultant	Asst. Prof.	3	2020	Yes	No
14.	Female	2	Yes	Consultant	Asst. Prof.	1	2020	Yes	No
15.	Male	2	Yes	Consultant	Associate Prof.	4	2020	No	Submitted only
16.	Male	2	Yes	PhD	Asst. Prof.	6	2021	No	No
17.	Male	3	Yes	PhD	Asst. Prof.	10	2021	Yes (2)	Submitted only

identified four themes that we believe thoroughly explain the research question and capture most data related to the study objectives. These comprise the importance and advantages of conducting research and publishing it, positive experiences of conducting research and its publication, challenges to conducting research and its publication, and facilitators for conducting research and its publication. Data interpretation is supported with appropriate quotations (Figure 1 and Table 2).

Theme 1: Importance and Advantages of Conducting Research and Its Publication

The participants in this study recognized a clear need to conduct research and publish as part of career progression. They stated a wide range of reasons for conducting research. Although participants asserted that conducting research or publishing it was part of a requirement for graduating from the master's program, a participant believed that he gained a new perspective in education to improve programs, curriculums, teaching methods, assessments, evaluations, and psychometric analysis. Others found that the scientific approach to medicine was crucial as it impacted upon the
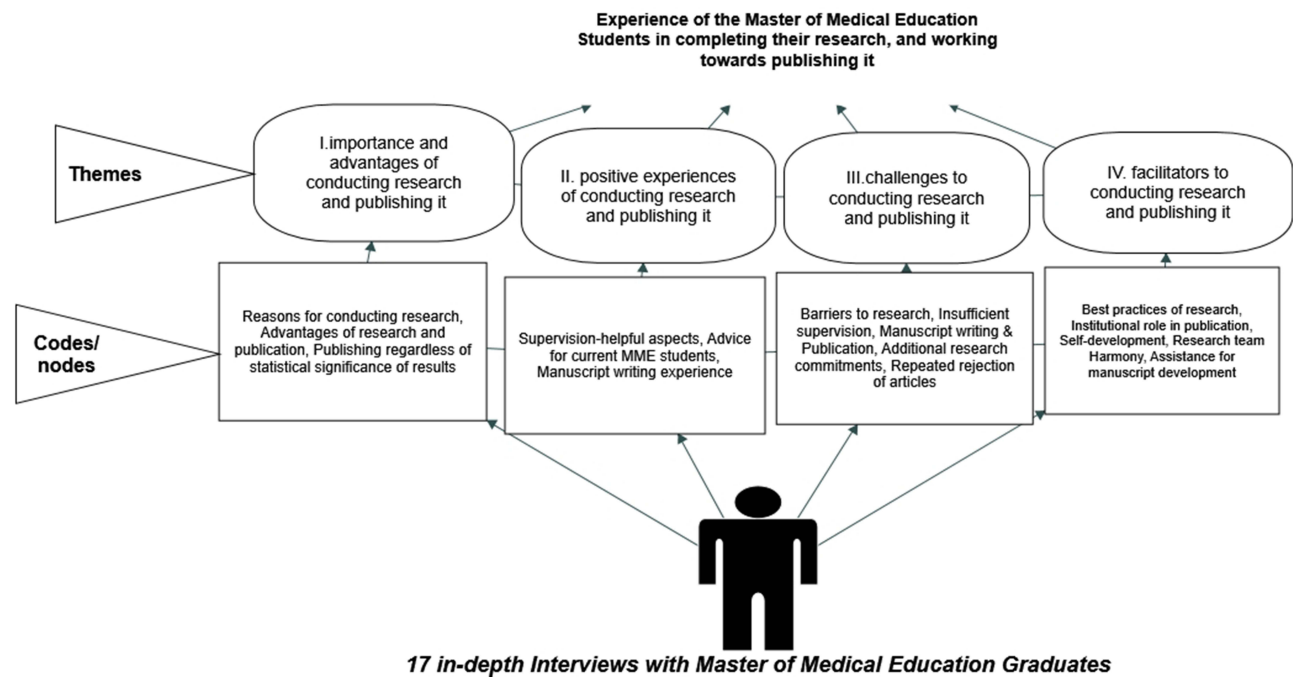
Figure 1 Thematic analysis of experience of the Master of Medical Education students in research and publications in Saudi Arabia.

way that they taught and led their institutions and departments. One common reason given for conducting and publishing scientific research was to advance in one's career. Many participants also indicated the need to have research based on local data that could produce evidence to inform decision-making locally and publish it for a wider global audience.

> Conducting research is important for the discoveries in scientific or educational fields that may only come through research. (7-Medical Educationist.)

> For faculty members, it is important for their promotion. For students, they need to conduct research as part of graduation requirements and to obtain an academic degree. *(A Male Anatomist)*

Other participants talked about several other aspects of research and publishing that they had found rewarding and useful in their careers. Publishing research itself was one joyful reward that most participants outlined. The participants believed that, even though conducting research was challenging and hard work, its publication and presentation at international conferences created a great sense of satisfaction and motivation. For some, the research project in the master's program was just the beginning of their inspiration to create an enabling research culture in their parent departments where they would use their experience to improve the quality of the programs.

> Without publication and sharing it with others, it would be useless. For academics, it is also useless and a waste of time, effort, and resources if they do research without publication. (6-Female Dentist.)

> Because it gives motivation to the researcher to pursue research. Especially if published in strong journals. It also proves the researcher is doing valuable work. (11-Male Radiologist.)

For many of the participants, the publishing of research led to a great sense of accomplishment. A participant who was a busy clinician found publishing a great achievement, which gave her a feeling of contributing to science and academia. Clinicians therefore showed a high degree of satisfaction with the research focusing on medical education as they believed it would help them apply research methods and experience in their fields.

Table 2 Codes and Theme Allocation Based Upon Code Relevance and Frequency

Themes	Number of Times Text Coded Across All 17 Participants
Theme 1: Importance and Advantages of Conducting Research and Its Publication	
Reasons for conducting research	5
Advantages of research and publication	52
Publishing regardless of significance of results	3
Theme 2: Positive Experiences in Conducting Research and Its Publication	
Supervision-helpful aspects	20
Advice for current MME students	15
Manuscript writing experience	20
Theme 3: Challenges to Conduct Research and Its Publication	
Barriers to research	67
Manuscript writing and publication	27
Additional research commitments	3
Repeated rejection of articles	2
Theme 4: Facilitators to Conduct Research and Its Publication	
Best practices of research	13
Institutional role in publication	59
Self-development	10
Research team harmony	19
Assistance for manuscript development	7

The results of my study were very rewarding. They helped me develop a new training system in the hospital for our students. (9-Female Applied Med. Scientist)

Theme 2: Positive Experiences in Conducting Research and Its Publication

The participants talked about valuable experiences that they had gained during their MME research projects. Most acknowledged that their supervisors played an undeniable role in project completion, supporting them with necessary guidance and technical insight. A prominent aspect of supervision in this theme is, however, the allocation of the supervisor. The participants highlighted that this process should align supervisor expertise with the research topic. Nevertheless, most researchers were found to be happy to have freedom to select a supervisor of the appropriate expertise and interests. Those students with supervisors on a different campus were unhappy with supervisor communication being mostly through emails or virtual meetings.

They were very supportive of me throughout my research, whenever I needed them, and they motivated me to publish my research. (15-Male Rheumatologist.)

Table 3 Main Facilitators and Barriers in Conducting Research and Its Publication Identified by Master of Medical Education Graduates in Saudi Arabia

Facilitators	Barriers
• Supportive program environment • Time management • Personal skill development • Academic writing skills • Co-investigator support • MME-foundational course/research training • Sufficient knowledge on basic research • Understanding of how to organize articles for journals • Identifying a project with a focus • Having useful findings from research • Biostatistical and data management skills • Previous exposure to research related courses • Previous experience with literature review • Training on quantitative software • Support with editing and proof reading of manuscripts • Availability of biostatisticians	• Job commitments • Busy supervisors • Selecting an appropriate research topic • Finding an appropriate journal • Lengthy procedure to get ethics approval. Frequent rejections by journals • Study results not statistically significant • Insufficient knowledge of conducting qualitative studies • Publication fees • Understanding of biostatistics • Submission of a lot of paperwork • Time constraints • Participant refusals • Weak academic English writing • Disagreement within research committee about the research topic • Busy and late replying supervisors • Other research commitments • Poor academic writing • Administrative and bureaucratic processes • Referencing support

I chose my supervisor according to the topic of my interest. I like and prefer this way over being assigned to a supervisor. (1-Male Clinical Anatomist)

The field of expertise of the faculty members and their topics of interest should be displayed to allow students to choose or match their supervisors accordingly. (11-Male Radiologist)

Asked what kind of advice the researchers would give based on their own experience of research to the junior students in the same program, the participants highlighted starting to work on the project early, selecting an innovative and researchable topic, participating in resources to improve writing skills, focusing on designing the methods well, communicating effectively with the supervisors, and managing the project efficiently.

Start early. Choose a simple topic that will be attractive for journals to be published and easy for you to complete in the given timeline. (4-Male Microbiologist)

The participants also provided useful tips for the final master's degree thesis defense. They talked about the need to rehearse and practice presentations with the supervisors, brainstorming potential questions that examiners might ask, and identifying and being prepared to explain weaknesses in the project.

Mock viva, which means simulating the thesis defense, i.e., the students should sit with their supervisors and present their work, and the supervisors should prepare the students by asking questions. (1-Male Clinical Anatomist)

Theme 3: Challenges to Conduct Research and Its Publication

Participants who had published their research projects experienced a wide range of barriers. One of the main challenges was the commitment to the full-time jobs and demanding work, especially for research faculty who were also clinicians. For them, the limited time for research was only one of the many contributing factors, and it was more challenging for them to find solutions to several other obstacles in their way of successfully completing their research projects (Tables 3 and 4).

I am a pediatric emergency consultant, and my job includes on-call and night shifts in addition to my family commitments. (14-Female ER consultant.)

Table 4 Opinions of Participants with and without Any Publications from Their Master of Medical Education Research Project

Participants with Publications	Yes	No	Participants without Publications	Yes	No
What were the success factors for your paper to be published?	–	–	Do you plan to publish your thesis in the future?	9	2
Supportive program environment	3	3	Institutional factors	1	10
Time management	6	0	Personal or professional responsibilities	10	1
Available resources	4	2	Burnout	3	8
MME foundational course (Block-3)	5	1	External- imposed deadlines	8	3
Sufficient knowledge on basic research	6	0	Barriers in research process	5	4
Good writing abilities	6	0	Insufficient knowledge on basic research	2	9
Understanding of how to write for publication	6	0	Poor writing/grammar abilities	3	8
Completed research training	5	1	Lack of understanding of how to write for publication	2	9
Alignment of thesis with career goals	4	2	Writer's block	2	9
Identifying a project with a limited scope.	5	1	Limited time	10	1
If faculty- Academic rank or gain a Degree	4	2	Fear of rejection	2	9
Funding (external)	1	5	Lack of theoretical contribution	2	9
Statistically significant results	3	3	Too specific to research context	2	9
Career progression	5	1	Using context as a contribution	0	11
			Failure to provide actionable recommendations for practitioners	3	8
			Poor article structure to include basic elements	1	10
			Submitting an article simply to "receive some feedback"	0	11
			Not having an opportunity to perform research	0	11
			Not encouraged by seniors/ administration	0	11
			Insufficient education in writing papers for publication	3	8

Most MME students are faculty members with teaching duties, while others are physicians that have clinics to run, patients to treat, and meetings to attend. Others have administrative duties. The job commitments did delay my publication process. (4-Male Microbiologist.)

Although participants were generally satisfied with the overall supervision they received for their projects, a common concern was that the supervisors could be more helpful. There was one participant who believed that the supervisor could have helped publish his article. Many participants explained that the supervisors were often senior faculty members, and they were difficult to approach because they were extremely busy. They believed that the supervisors could be more helpful, specifically in developing research questions and methods, the aspects needing the most support Sometimes my supervisors reply to me after 3, 4 or 5 weeks. So, this is too much time wasted. (15-Male Rheumatologist.)

Moreover, there were contrasting experiences. One participant believed that specific support was lacking when needed, eg when in a dilemma about selecting between two study designs because of a disagreement between research committee members.

> I was hesitant between two study designs and the research committee did not guide me nor help to choose the right one because half of them were with one design and the other half was with the other design. (13-Female Medical Educationist)

Another participant, who believed that he required better skills in data analysis and referencing, was dissatisfied with the support received. He believed that libraries could do a better job of assisting researchers in organizing their research work. It must be noted though that other participants were satisfied with support received.

> The institutional services were very poor. They do not provide good programs such as SPSS nor EndNote. The services provided in their library are also poor and need to be upgraded. (11-Male Radiologist.)

Another dominant challenge that most participants highlighted was the writing of protocols, theses, and manuscripts. One reason for researchers experiencing this difficulty was when they found academic writing challenging where they were advised to rewrite entire portions of a document. Many of these researchers were clinicians with limited experience of writing academically. They found it difficult and frustrating to edit their writing after minimal comments by their supervisors, which suggested that participants wanted more constructive and specific advice.

> It was a bit challenging for me as a physician to write in the field of medical education, especially writing for the qualitative part. And writing is not our primary profession. So, I had to review it several times until I reached the (required) level. (3-Male Pediatrician.)

These challenges are reflected in some failures highlighted in the publication process. Some participants' papers were rejected because of poor topics, design, and analysis, leading the participants to look for lower-ranked journals. Many participants mentioned frequently changing their research topic, causing delays and disrupting the whole project timeline. This they believe could be improved with better supervision, support with targeting and submitting to the most relevant journals, and a better selection of research topics to ensure that the articles are attractive and innovative for the journals to consider for publication.

> I submitted it to two journals that rejected my paper. I believe it was because I was aiming too high, and these journals had very high impact factors. The other journal had some concerns regarding the study design, methodology and assessing validity and reliability. (7-Medical Educationist)

> It was very difficult because academic writing for publication requires good writing skills. (2-Male Health Informatics specialist.)

For some students belonging to basic or clinical sciences, the course was a little less relevant to their future research as it was more specific to medical education.

 MME in general did not add much to my knowledge, really. It only opened my eyes to the domains of medical education. I did not gain much experience in MME.

> I just wish I knew more about better topics in medical education research when I started my project. (6-Female Dentist)

> Because my familiar area of research is basic science research, the area of research in medical education is different (than mine). It is education-based research. (16-Male Anatomist)

The individual experience of what facilitated the participants in their research work therefore varied and it seemed to have depended upon the type of resources a researcher required and at what stage of the research. For instance, a few researchers who had selected qualitative studies experienced issues in analyzing their data because of a lack of training in qualitative data analysis techniques. As a result, it was also common for these researchers to outsource some types of work, including qualitative data analysis or editing of their articles.

> I wish I knew how to utilize the NVIVO program for data analysis. (14 female emergency room consultants)

Theme 4: Facilitators to Conduct Research and Its Publication

Participants recognized that, without the support and facilitation from their institutions and other resources, it would have been difficult for them to accomplish their research. It seemed that the researchers were able to access these resources

adequately within the institution when they needed them. They were particularly happy about the way they received help in analyzing their data. Moreover, some researchers believed that novel research ideas and statistically significant research results may enhance their chances for publication. They also thought that good writing abilities and an understanding of how to write for publication play a major role in paper publication.

> I had good support from the research unit to do the data analysis and in extracting the results as well. The idea of my research was new in the field and my results were significant. I have good writing abilities and a good understanding of how to write for publication. (1-Male Clinical Anatomist)

The MME program was generally helpful for the participants in acquiring research skills. Some researchers attributed their success in publishing their papers to good time management, good personal skills, and their ability to complete the research. The participants found the MME more useful though with some prior knowledge and experience of research they found it more useful than those with little previous exposure to research, particularly in orienting to research methods.

> I was able to publish my paper thanks to a supportive program environment, MME-foundational courses, time management, personal skills, and the completion of research. (5- Female Microbiologist)

Discussion

Understanding the facilitating factors and barriers to conducting and publishing research is essential to promote a culture of scientific inquiry in the field of medical education that would lead to an improved and evidence-based practice. This analysis identified that the graduates of the MME program were adequately aware of the benefits of conducting research and the need to publish it. Participants in this study identified several examples of positive experiences of conducting research that they found encouraging. Based upon their experiences of completing their research projects effectively, they offered a range of advice for the researchers in the domain of medical education relevant in the middle east region and beyond. Furthermore, a wide range of challenges and barriers were identified in this study which underscore the need to address these barriers that contribute towards discouraging graduates of MME or any other graduate program to publish their research projects. Apart from these barriers, the participants talked about what facilitated them in their institutions, or in their job settings that enhanced their abilities to accomplish research successfully leading to publishing it. This study has also helped compile an explicit list of these facilitators and barriers experienced by graduates of a medical education graduate program that can be utilized to improve programs in similar settings.

Studies have shown that factors that facilitate students through institutional support and capacity-building also motivate them to conduct research independently by improving their competency to perform publishable research.[12,13] Our results are consistent with a study showing a link between these factors of research ability and students' motivation to conduct research. The same study found that in order to encourage students to engage in independent research, they need targeted training and capacity-building to familiarize them with the necessary research skills.[7] Other studies have identified institutional and peer factors such as rating of the research output through the h-index and its positive impact upon a higher probability of research accepted for publications.[14] A study from Oman also identified that a dedicated research training program can more than double postgraduate health professionals' research outputs such as publications.[4] An important factor that was identified by our study was the need for support by their supervisors in various steps of their research, particularly initially when they needed to identify their research topics or select appropriate journals aligned with their manuscripts. According to a couple of qualitative studies, supervisor and student collaboration and teamwork are one determinant in successful research completion, including benefits such as generation of research questions and topics and resource sharing.[9,15] The advice by some of our participants to prepare the research work for early publication is consistent with existing literature.[6]

For some participants, navigating the research process was difficult, as understood by their accounts of barriers faced at different steps of their research projects. The research process was particularly challenging for practicing medical professionals who wanted to seek a qualification in medical education to play a future role as medical educators. Graduates who were also practicing while they were enrolled in the master's program were pressed for time and had

limited knowledge to find useful resources required to accomplish their work. Deficiencies in capacity to identify appropriate research topics and compile research protocols are stated in literature as common barriers to medical education related research.[16] Our findings are consistent with this body of literature where our participants identified several examples of these technical limitations ranging from analyzing qualitative data to writing the manuscripts. One of the barriers in our study was a demotivating perception that negative results would not be publishable. In any aspect of medical education research, including curricular development and curriculum implementation, underestimating the benefits of publishing poor, inconclusive, and negative outcomes can limit the comprehension and understanding of the program, thereby reducing the improvement and incorporation of research into policy and practice.[17,18] An enabling institutional environment is crucial to success in any research project, allowing research students access to guidance and support from their supervisors and other essential resources without any barriers.[19,20] Similar calls for improving the quality of research programs through creating an enabling environment are also heard from this region.[21]

Our study participants had also signed a publication contract that mandated them to publish their research projects, however this did not seemingly stimulate the students to publish their projects. We believe if some of them published their projects, it was because of their own efforts towards capacity-building or other similar factors of motivation. Another possible reason for some participants' failing to publish could be that they prioritized other research within their original field over their MME research projects because they may have believed the former to be more important for career progression and promotions. Moreover, paper rejection for publication due to improper journal selection for aim and scope was one of the struggles faced among the participants rather than quality or content of paper, which was consistent with the most common reasons of manuscript rejection mentioned in literature.[22]

Qualitative in-depth analysis using thematic analysis was a major strength of this study; and accessing participants from a wide range of backgrounds was another strength. However, the study had limitations though, one of which is its transferability. The other limitation was that the majority of participants were from batch 11. Further studies are recommended to incorporate a larger sample and use the items identified in this study to estimate quantitatively the independent effect of these barriers and facilitators of the research and publications by medical education postgraduate students.

Conclusions

This study emphasizes the need of identifying and addressing the context-specific constraints and challenges that master's students face in completing research projects and supporting the graduates towards research that is result-oriented and culminates in publications. Masters' student researchers, particularly those working on challenging topics, require critical supervision, an enabling environment, technical support, and advice throughout the research process. Postgraduate institutes should establish a structure and culture that encourages staff and students to use the most up-to-date evidence in their practice and education.

Abbreviation

MME, Master of Medical Education.

Data Sharing Statement

All data generated and analyzed during this study are included in this published article.

Ethics Approval and Consent to Participate

Participation in the study was voluntary, and all the participants had the option to withdraw from the study at any stage of the research without giving any reasons. Informed consent was distributed to graduates, explaining the purpose and benefits of the study, and they were reassured about anonymity. Information that could identify participants was saved securely. Ethics approval was obtained from the Institutional Review Board of King Abdullah International Medical Research Center, National Guard Health Affairs, Riyadh, Saudi Arabia (IRBC/1586/21).

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Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation, or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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Disclosure

The authors report no conflicts of interest in this work.

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