

“To guide my life and art”: A triangulated study on the behavioral competencies for effective medical practice in Nigeria

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Abstract

Background: Variation in clinical performance is attributable to factors outside academic and clinical skills. Selection processes and training programs for medical professionals should be adapted to consider these behavioral factors, which may vary across contexts. This study was conducted to identify behavioral competencies considered relevant for effective medical practice among medical students and practitioners in Nigeria.

Methods: We drew on a scoping review to develop a starting list of behavioral attributes that correlate with effective service provision. Drawing on nominal group technique exercises with 17 medical students and 11 physicians, this starting list was modified with scoring and ranking of selected competencies. We compared the list of competencies and rankings between medical students, doctors, and the scoping review.

Results: The scoping review identified nine articles for full-text review, resulting in a starting list of 21 behavioral competencies defined in studies conducted in non-African countries. The nominal group technique exercises conducted with medical students and doctors yielded a condensed list of 32 and 27 behavioral competencies respectively. For doctor-client interactions, the behavioral competencies considered most important included effective communication and patient-centeredness. Whereas, for doctor-colleague interactions, team work, respectfulness, and management ability were ranked highly. However, there were clear divergences between groups and with the scoping review.

Conclusions: This study is one of the first to identify the perspectives of medical students and physicians on behavioral competencies considered essential for effective medical practice in an African country. We found differences in the perspectives of medical physicians and students, and in the prioritized competencies across contexts. This illustrates the need for careful consideration in identifying subject matter experts and in generalizing competencies across contexts. Future research in this field in Nigeria should examine effective ways of testing for key behavioral competencies among medical students and for residency programs. Also, investigating the perspectives of medical faculty and administrators on important competencies, and exploring the generalizability of these competencies across cultures in Nigeria should be considered.

Background

The text of the Hippocratic Oath includes a pledge by the physician, “in purity and holiness, to guard my life and art” [1]. Since the Classical period, appropriate values and behavior of the physician have been considered important for medical practice. There is empirical evidence to support this perspective. Academic and clinical performance have been shown to account for only 23 percent of variation in performance in undergraduate medical training and 6 percent of variation in performance at the

postgraduate level [2]. Hence, variation in the performance of medical professionals is also attributable to factors outside academic and clinical skills.

The norm in many countries, however, is to select medical professionals almost exclusively based on academic ability and clinical acumen [3], [4]. Appropriate selection processes for medical professionals should also assess for behavioral attributes which reflect values that are compatible with high-quality health care provision [5]. The renewed attention being given to strengthening the quality of health care globally to facilitate improved health outcomes, provides an impetus to re-examine this norm to ensure that medical professionals have both the academic and behavioral competencies to provide effective care [6], [7], [8].

To consider values and behavioral competencies in selecting and training medical professionals, we must identify and measure them [4]. Patterson and Zibarras, in their seminal report on the selection and recruitment of medical professionals, addressed these pre-requisites. They define values as enduring beliefs one holds about what is a preferable state of things and provide principles that guide one's actions or behavior [4], [9]. They also clarified that to measure these values in medical professionals, an appropriate selection system must clearly identify the attributes or behaviors that reflect these values. This system must also derive key attributes from individuals who have direct experience in or have a good understanding of the role and are thus subject matter experts [4]. In line with these recommendations, studies in high-income countries have examined the perspectives of medical students and professionals, who can be considered subject matter experts, on the qualities and behaviors of a high-performing physician [10], [11].

There have also been efforts in low and middle-income countries, particularly in Asia, to specify technical and non-technical competencies for medical students and graduates [12]. However, there is a relatively sparse literature that investigates behavioral competencies among medical professionals in African countries. Given the variation in service delivery needs across countries, behavioral competencies may not always translate across contexts. Hence, the objective of this study was to identify behavioral competencies considered relevant for effective medical practice of physicians among medical students and practitioners in Nigeria, by triangulating a scoping review and nominal group technique (NGT) exercises. By comparing the competencies described by subject matter experts in Nigeria with those described in the global literature, we also explore their generalizability across contexts.

Methods

Scoping review

Scoping reviews are an ideal tool to determine the coverage of the body of evidence on a topic [13], [14], [15]. These reviews can help to identify the types of evidence in a field, examine how research in a field is conducted, identify the key characteristics of a concept, inform a systematic review, and analyze knowledge gaps [14]. For this study, we utilized a scoping review to identify behavioral attributes that correlate with effective service provision and which are not indicators of clinical acumen or academic

performance. The behavioral attributes from the scoping review served as discussion prompts in the group exercise described later in this section.

We undertook steps in the scoping review in line with guidance provided in a seminal paper by Arksey and Malley [13]. We identified the research objective of the scoping review as aiming to describe behavioral competencies required for medical practice. We then performed a search on Google and PubMed for relevant studies, including peer-reviewed articles and grey literature, published in English, between 1st January 2007 and 30th June 2019, regardless of methodology or country of focus. The search algorithm included the following terms: values, behavior, competence, medical practitioner, doctor, medical professional, health practitioner, health professional, auxiliary, non-cognitive, non-clinical, non-academic, selection criteria, selection process, situational judgment test, and review.

Following the initial search, the title and abstract of each publication were reviewed to verify compliance with the inclusion criteria described above, and the bibliographies of identified studies were reviewed for other publications that may be eligible for inclusion. The full text of the final set of included studies were reviewed by two independent researchers to extract the behavioral competencies required for medical practice and definitions of the identified behavioral competencies (if any). Drawing on these definitions, duplications were removed, and a list of non-overlapping behavioral competencies was derived.

Nominal group technique (NGT) exercise

The NGT is a group consensus-building method that aggregates the opinions of individuals that have experienced a phenomenon using a structured format [16], [17], [18]. Through anonymous voting, it promotes equal opportunity for participants to contribute, reduces the influence of dominant speakers in group interactions, and ensures that individual voices do not skew the debate. For this study, we used NGTs to elucidate the consensus of medical students and professionals on the behavioral competencies required for physicians to provide effective care.

The NGT exercises were conducted in May – June 2019 in the College of Medicine, University of Nigeria, given the availability of physicians involved in clinical practice and training, including medical students and doctors in the affiliated teaching hospital, and whose input might inform more formal guidelines on intake into medical school and residency training. At the face-to-face recruitment, participants were informed that the aim of the study was to determine important behavioral competencies required for medical practice in Nigeria.

The study team purposively selected twenty medical students in the penultimate and final year of clinical training, and who had thus been exposed to rotations in internal medicine, surgery, pediatrics, obstetrics and gynecology, and community medicine, of whom seventeen (eleven males and six females) consented to participate. The study team also purposively selected twenty medical residents, equally distributed among the main clinical specialties: internal medicine, surgery, pediatrics, obstetrics and gynecology, and community medicine. Eleven residents (three males and eight females) consented to participate.

We held one NGT with medical students in May 2019 and another with medical residents in June 2019. Discussions were held in a quiet, secluded room situated in the University teaching hospital. All discussions were conducted in English Language and audio-recorded with the consent of the participants. Hand-written notes describing the group interactions were taken by a member of the research team.

Each NGT started with a review of the objective of the discussion and the process of conducting NGTs. The starting list for the discussion was derived from the results of the scoping review on the global evidence on behavioral competencies required for medical practice, that were grouped based on their relevance for interactions with clients or colleagues by the study team and participants. During the NGT exercise with resident doctors, this starting list had been modified to reflect the list of competencies generated from the first NGT exercise with the medical students.

The study question of identifying behavioral traits that are essential to effective practice among medical professionals was restated. In round robin fashion, that is with one response per person per round, everyone in the group was given the opportunity to add to the starting list, with three rounds in total. The responses were recorded on a flip chart without criticism. Repetitions and overlaps between responses were noted, clarifying questions were asked when needed, and participants attempted to provide definitions for each competency.

Based on the updated list, participants were asked to anonymously select and then rank five most relevant competencies for interactions with clients and with colleagues. Each list of five competencies was then ranked in order of importance for effective practice, with "5" indicating the most important competency and "1" indicating the least important competency. The aggregate score for each competency was generated by summing the numerical scores. Results from the voting and ranking were discussed. Participants were then asked to re-rank their original top five ideas for each interaction. The aggregate score for each behavioral competency and changes from the first round of voting were calculated. An overview of the NGT process is provided in Figure 1 below.

Drawing on the updated list and definitions, we triangulated our findings across the scoping review and NGTs. We compared the final list of competencies defined by medical students with medical doctors, and the respective rankings of each competency for doctor-client and doctor-colleague interactions using an arbitrarily-selected decision rule (aggregate ranking of greater than equal to 10) that reflected relative consensus on the importance of the competency. We then identified parallels between behavioral competencies common across both groups and the results of the scoping review of the global literature.

Three members of the research team are physicians, who have experience providing primary and specialist care. The other member of the research team has a graduate degree in health promotion and communication. One of the members of the research team with significant prior experience conducting NGT exercise provided training to the other team members involved in data collection. The guide for the NGT was also discussed with experts from other disciplines, to ensure that the guide and probes were

free of pre-conceived opinions of the research team on the subject matter. The study findings have been reported in line with the consolidated criteria for reporting qualitative research (COREQ) [19].

Results

In the scoping review, the initial search on Google Scholar and PubMed yielded ten citations, of which eight were peer-reviewed publications and two were grey literature. Following a review of the titles and abstracts of the citation, a total of four papers were excluded for not meeting the inclusion criteria, and the remaining six citations were given a bibliography review to identify other relevant articles. A total of six new citations were identified following the bibliography review, three were excluded and the total number of publications included in the full text review was nine. An overview of the study selection process is shown in Figure 2.

The scoping review resulted in a starting list of 21 behavioral competencies defined in Table 1: collaboration, effective communication, resilience, professionalism, management, empathy, health advocacy, patient-centeredness, ethical responsibility, role differentiation, social affect, cultural sensitivity, systems-based practice, neutrality, probity, flexibility, initiative, creativity, reliability, service orientation, and capacity for improvement [10], [11], [20], [21], [22].

Following round robin contributions, the NGT with medical students and doctors yielded 63 and 42 competencies respectively. Elimination of overlapping concepts condensed the list of behavioral competencies to 32 for medical students and 27 for medical doctors. All the medical students and doctors were involved in the initial ranking exercise for the top five behavioral competencies, while 1 medical doctor opted out of the re-ranking exercise following a discussion of the aggregate rank results. The voting results for the condensed list of competencies for medical students and doctors are shown in Table 2 and Table 3. Top ranked competencies for doctor-client interactions were effective communication, patient-centeredness, empathy and professionalism. Top-ranked competencies for doctor-colleague interactions were teamwork, team leadership and management ability, effective communication, respectfulness and professionalism.

A comparison of the voting results between medical students and doctors revealed commonalities and divergences in the competencies considered important for doctor-client and doctor-colleague interactions (Table 4). For doctor-client interactions, the behavioral competencies considered most important by both groups were team work and patient-centeredness while for doctor-colleague interactions, both groups ranked team work, respectfulness, and management ability highly. However, there were clear divergences between groups. For doctor-client interactions, medical students also ranked effective communication, professionalism, patience, piety, neutrality, probity, efficiency and passion as important, while medical doctors considered empathy and diligence to also be essential. With respect to doctor-colleague interactions, medical doctors specified the importance of conflict management as a sub-set of team leadership and management, while medical students voted other behavioral competencies highly, specifically effective communication, professionalism, confidence, probity and open-mindedness.

We explored convergences in the opinions of medical students and doctors in our study, as well as findings from the scoping review, summarized in the starting list, regardless of behavioral competency ranking. These findings are summarized in Table 5. The condensed list for medical students and doctors had 13 behavioral competencies in common, which is equivalent to 48% of the total list for medical doctors and 41% of the total list for medical students. There was a similar level of overlap between the condensed lists for medical students and doctors, and findings from other contexts (starting list derived from scoping review), with 12 common behavioral competencies for medical students and 11 for doctors, which is equivalent to 41% of the total list for medical doctors and 38% for medical students.

To inform our understanding of the differences in perspectives among the participants in our study and compared to other contexts, we conducted two-way comparisons between groups and identified competencies that were noted as important (regardless of behavioral competency ranking) in one group but omitted in the other. In Table 6, we have summarized the differences between the condensed lists for medical students and doctors.

Finally, we examined divergence between the condensed lists for medical students, doctors, and scoping review to highlight generalizability of findings from other contexts to Nigerian students and physicians. Several behavioral competencies in the scoping review were removed from the condensed list for both medical students and doctors, particularly service orientation, systems-based practice, and social affect. In a similar vein, the condensed list for medical students and doctors included behavioral competencies in common that were not found in the scoping review, including humility, respect for authority, and multi-tasking (Table 7 and Table 8).

Discussion

Our study of behavioral competencies for the Nigerian medical physician is one of first to have examined this question in an African country. Below, we reflect on the significance of the divergence between the perspectives of medical students and doctors, identified competencies, and generalizability across contexts.

The divergence of the elicited competencies between medical students and doctors in our study illustrates the need for careful consideration of who is nominated to be a subject matter expert in identifying qualities to be considered for medical student admissions or graduate residency programs. The differences between these groups may also signal the competencies that may be needed at different points in the training of a medical physician. Thus, while medical students, whose primary responsibilities involve learning and developing skills required for future practice prioritized curiosity, open-mindedness, passion, and a sense of humor; the medical doctors and graduate residents prioritized competencies that enabled them to undertake their duties of service provision within a hierarchical and multidisciplinary medical team including accountability, good judgment, diligence, conflict management, discipline, and accountability. Thus, a list of behavioral competencies developed by medical students for doctors may map directly to competencies needed for navigating a medical residency. There may,

however, be value in considering the behavioral competencies enumerated by medical doctors in defining the qualities of students admitted into medical school and in designing the medical curriculum, given the eventual relevance of these values and attributes for medical practice.

Given the above finding, it seems reasonable to conclude that the behavioral competencies elicited from the NGT with medical doctors are likely to more closely reflect the needs for actual medical practice than the view of medical students. In that respect, among doctors in our study, the top-ranked competencies for doctor-client interactions were ethical responsibility, empathy, patient-centeredness, diligence, and team work, while the top-ranked competencies for interactions with other medical colleagues were respectfulness, team work, and leadership ability including conflict management. These competencies overlap with factors identified in other contexts, including the United Kingdom and United States of America [10], [20]. To our knowledge, in Nigeria, these factors are not explicitly considered in admitting medical students, decisions on medical or surgical residency programs, or in appointing doctors into permanent positions in hospitals.

Less than 50% of the behavioral competencies identified in the scoping review were retained in the condensed lists of medical students and doctors in Nigeria. The divergence in identified behavioral competencies between participants in our study and the scoping review highlight the difficulty in generalizing across contexts for reasons that may include the sociocultural context. Potentially as a reflection of a context in which respect for elders is a valued attribute, where undergraduate and graduate medical training is led by older physicians, both medical students and doctors in our study identified humility and respectfulness as behavioral competencies that are important for effective practice [23]. These characteristics were not identified in a scoping review that largely included studies conducted in Western countries. An extensive body of literature has explored the differences in attitudes towards older people in society in Western versus Eastern cultures, with more negative views held in the West, exemplified by a 1975 study by Erdman Palmore [24]. Thus, broader cultural differences may be an important consideration in generalizing behavioral competencies across contexts.

However, there were other divergencies between the condensed lists from the NGTs and the scoping review that may reflect non-cultural differences in medical practice across countries. For example, medical doctors in the Nigerian context identified the importance of multi-tasking and self-care while the scoping review highlighted the need for systems-based practice. On the one hand, a Nigerian medical doctor, who works in a resource-constrained environment, may find the need to perform multiple functions that may be ascribed to other members of the medical team in a more advanced economy, such as nurses and physician assistants. This may explain the need to multi-task and to pay attention to emotional well-being, as important attributes of the effective physician in this context. As clinical practice may not have evolved to systematically consider the broader social determinants of health, including health systems, within clinical guidelines and training in Nigeria, physicians did not consider systems-based practice to be an important behavioral competency overall, and eliminated it from the starting list. Thus, cultural and non-cultural differences in medical practice across contexts introduce difficulty in generalizing from competencies developed in specific countries.

We have identified several limitations that our study faces. While we included the perspectives of medical students and graduate residents who are practicing physicians, our study may have benefitted from discussions with supervising or consultant medical physicians and medical administrators, who in practice may be involved in defining the required competencies for medical physicians. Regardless, medical students and physicians have been considered as subject matter experts in other studies in the literature given their direct involvement in training and service provision. Future studies may compare perspectives across these multiple groups to identify the appropriate group to define behavioral competencies in guidelines for medical student admissions, residency program selection decisions, and appointment of medical faculty.

While NGTs provide an objective means of consensus building on behavioral competencies that may be replicated in practice, these methods face important limitations. For example, the voting process may not lead to a convergence of opinions with multiple competencies given low ratings, dominant individuals may influence the re-ranking process during the discussion of initial rankings, ideas may be constrained by the initial list of ranked competencies, and the process may be mechanical relative to other qualitative methods such as focus group discussions. Having considered these limitations, NGTs through anonymous voting and when led by trained facilitators can mitigate some of these negative features, including reducing the influence of dominant individuals and facilitating a more fluid process of arriving at consensus.

The literature exploring the consideration for behavioral competencies in Nigeria and more broadly, in low- and-middle-income countries is still nascent. There is a need for future studies that examine and compare behavioral competencies for medical practice across groups defined by culture and geography. Furthermore, admissions procedures and training curricula that systematically incorporate these competencies need to be developed, pre-tested, and examined for their impact on performance of medical students and physicians.

Conclusions

In this study, we have triangulated findings from a scoping review and NGTs with medical students and physicians to identify behavioral competencies considered essential for effective medical practice in Nigeria. We find differences in the perspectives of medical physicians and students, and in the prioritized competencies across contexts that illustrate the need for careful consideration in identifying subject matter experts and in generalizing competencies across contexts respectively. There is a need to build the evidence base on effective ways of testing for key behavioral competencies among medical students and for residency programs, to examine the perspectives of medical faculty and administrators on important competencies, and to explore the generalizability of these competencies across cultures in Nigeria.

Declarations

Declarations

Ethics approval and consent to participate

Approval for this study was obtained from the University of Nigeria Teaching Hospital Health Research Ethics Committee (NHREC/05/01/2008B-FWA00002458-1RB00002323). All participants provided written informed consent to participate in the study.

Consent for publication

Written informed consent for publication of study findings was obtained from all participants. A copy of the consent form is available for review by the Editor of this journal.

Availability of data and material

The recordings from the nominal group technique discussions are available from the corresponding author on request that specifies the research objective and commits to maintaining anonymity of respondents.

Competing interests

The motivations, findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data

included in this work. The authors declare that they have no competing interests.

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Authors' contributions

AC and CM conceptualized the study; AC, CM, UO, and IA designed the study; CM, UO, and IA led the nominal group technique exercises; UO and IA conducted the scoping review; CM analyzed the data; AC, CM, UO, and IA interpreted the data, drafted the manuscript, and were involved in revising the intellectual content of the manuscript. All authors read and approved the final manuscript.

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Authors' information (optional)

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Abbreviations

COREQ – Consolidated criteria for reporting qualitative research

NGT – Nominal group technique

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Tables

Table 1: Starting list of behavioural competencies for medical practice from scoping review

Competency	Other descriptors	Definitions
Collaboration	Teamwork	Ability to be a team player; works collaboratively with others to achieve shared goals; shares information and knowledge with others; and provides feedback.
Effective communication		Effectively conveys information to others using spoken and written sentences; listens effectively; recognizes potential communication barriers; and adjusts approach or clarifies information as needed.
Resilience	Coping with pressure	Demonstrates tolerance of stressful or changing environments or situations; is persistent even in difficult situations; recovers from setbacks; and ability to make decisions under pressure.
Professionalism		Demonstrates accountability to patients, society and the profession; demonstrates excellence and ongoing professional development; and demonstrates respect for patient privacy and autonomy.
Management		Potential for leadership; ability to work with and persuade people to work towards a common goal; and ability to take charge or be in control.
Empathy	Humaneness	Pro-social attitude; demonstrates empathy; demonstrates a non-judgmental attitude; and is compassionate.
Health advocacy		Promotes quality care and optimal health systems; uses influence to highlight health needs; contributes to health of community; and acts according to legislation.
Patient-centeredness		Recognition that patient care is the primary concern; demonstrates responsiveness to patient needs that supersedes personal interest;
Ethical responsibility		Aware of ethical issues in professional medical behaviour; and adheres to ethical principles and follows rules and procedures.

Role differentiation		Recognizing one's limits and those of others; and clarity in expectations about appropriate duties in clinical interactions.
Social affect		Demonstrates an awareness of other's needs, feelings, and goals; and understands the ways that social and behavioural cues affect interactions.
Cultural sensitivity		Shows an appreciation for multiple dimensions of diversity; and appreciates that human behaviours are socially and culturally constructed.
Systems-based practice		Understands how one's actions affect and are affected by the larger system; and able to work in various health care delivery and public health settings.
Neutrality	Impartiality	Demonstrates objectivity in assessing the performance of others; and does not allow personal characteristics of patients or colleagues to influence interactions.
Probity		Demonstrates trustworthiness and integrity; cultivates personal and academic integrity; and being honest.
Flexibility	Adaptability	Demonstrates an ability to respond appropriately to change, complexity and uncertainty; and ability to adapt decisions in timing and scale to changing conditions.
Initiative		Demonstrates an ability to assess things and work independently; and an ability to use one's judgement to make decisions and do things without needing to be told what to do or before others do.
Creativity	Innovativeness	Demonstrates an ability to produce unusual or original ideas for creating things; and demonstrates new ways of using existing ideas to solve other problems.
Reliability	Dependability	Consistently fulfils obligations in a timely and satisfactory manner; and takes responsibility for personal actions and performance with respect to goals.
Service		Demonstrates a desire to help others and sensitivity to

orientation		the feelings and needs of others.
Capacity for improvement		Sets goals for continuous improvement and for learning new concepts and skills.

Table 2: Condensed competency list and rank results for medical students

Doctor-client interaction		
Competencies	1st Ranking	Re-ranking
Effective communication	50	57
Patient-centeredness	45	51
Professionalism	19	20
Patience	7	14
Piety	13	14
Teamwork	21	12
Neutrality	11	12
Probity	9	11
Efficiency	11	10
Passion	11	10
Ethical responsibility	9	9
Initiative	12	7
Resilience	8	7
Cheerfulness	3	6
Confidence	3	4
Open-mindedness	7	3
Sense of humour	3	3
Adaptability	2	2
Humility	1	2
Health advocacy	2	1
Multi-tasking	1	0
Curiosity	2	0
Doctor-colleague interaction		
Competencies	1st Ranking	Re-ranking
Teamwork	24	70
Management	33	45
Effective communication	30	28
Professionalism	22	19

Confidence	15	17
Probity	24	15
Respect for authority	25	13
Open-mindedness	9	11
Self-satisfaction	2	8
Humility	12	7
Efficiency	6	6
Ethical responsibility	4	4
Patient-centeredness	0	4
Neutrality	2	2
Creativity	3	2
Cheerfulness	2	2
Resilience	3	1
Patience	1	1

Table 3: Condensed competency list and rank results for medical doctors

Doctor-client interaction		
Competencies	1st ranking	Re-ranking
Empathy	17	18
Patient-centeredness	9	15
Diligence	19	13
Team work	1	10
Good judgement	10	6
Tolerance	4	6
Approachableness	1	6
Time consciousness	7	5
Discipline	5	4
Team leadership and conflict management	6	3
Psychosocial balance	5	3
Self-care	1	3
Punctuality	3	2
Probity	0	2
Confidence	2	2
Ability to cope with stress / Resilience	1	1
Respectful	0	1
Reflexive thinking	1	0
Doctor-colleague interaction		
Competencies	1st ranking	Re-ranking
Respectful	29	24
Team work	27	27
Team leadership and conflict management	14	17
Ability to take correction	9	9
Psychosocial balance	6	6
Tolerance	6	6
Reliability	5	5
Time consciousness	5	5
Diligence	5	4

Approachableness	4	4
Probity	4	4
Accountability	4	4
Humility	3	4
Resourcefulness	3	3
Patience	2	3
Empathy	2	2
Discipline	2	2
Good judgement	5	1
Ability to cope with stress / Resilience	1	1
Multi-tasking	1	1
Perseverance	1	0
Self-motivation	3	0

Table 4: Comparing behavioral rankings of medical students and doctors for competencies with aggregate ranking of ≥ 10 (commonalities in italics)

Doctor-client		Doctor-colleague	
Medical student	Medical doctor	Medical student	Medical doctor
Effective communication	Empathy	<i>Team work</i>	<i>Respectful</i>
<i>Patient-centeredness</i>	<i>Patient-centeredness</i>	<i>Management</i>	<i>Team work</i>
Professionalism	Diligence	Effective communication	<i>Leadership (and conflict management)</i>
Patience	<i>Team work</i>	Professionalism	
Piety		Confidence	
<i>Team work</i>		Probity	
Neutrality		<i>Respectful</i>	
Probity		Open-mindedness	
Efficiency			
Passion			

Table 5: Commonalities between condensed lists from NGT exercise and starting list from scoping review

Medical students and doctors	Medical students and starting list	Medical doctors and starting list
Patient-centeredness	Effective communication	Patient-centeredness
Patience	Patient-centeredness	Team work
Team work	Professionalism	Probity
Probity	Team work	Tolerance
Efficiency	Neutrality	Resilience
Creativity	Probity	Management
Initiative	Ethical responsibility	Creativity
Resilience	Resilience	Empathy
Confidence	Adaptability	Reliability
Humility	Health advocacy	Capacity for improvement
Multi-tasking	Management	Initiative
Team leadership	Creativity	
Respectful		

Table 6: Examining divergence between the condensed lists for medical students and doctors

Medical students list only	Medical doctors list only
Effective communication	Empathy
Professionalism	Diligence
Piety	Good judgment
Neutrality	Reflexive thinking
Passion	Approachableness
Cheerfulness	Time-consciousness
Open mindedness	Discipline
Sense of humour	Self-care
Adaptability	Reliability
Health advocacy	Responsibility
Curiosity	Accountability
Self-satisfaction	Ability to take correction
Ethical responsibility	Psychosocial balance
	Resourcefulness
	Tolerance
	Conflict management

Table 7: Examining divergence between the condensed lists for medical students and the scoping review

Medical students list only	Scoping review only
Patience	Empathy
Piety	Reliability
Efficiency	Capacity for improvement
Passion	Initiative
Initiative	Role differentiation
Cheerfulness	Social affect
Confidence	Culture sensitivity
Open-mindedness	Systems-based practice
Sense of humour	Service orientation
Humility	
Multi-tasking	
Curiosity	
Respectful	
Self-satisfaction	

Table 8: Examining divergence between the condensed lists for medical doctors and the scoping review

Medical doctors list only	Scoping review only
Punctuality	Effective communication
Self-motivation	Professionalism
Confidence	Neutrality
Humility	Adaptability
Multi-tasking	Social affect
Respectful	Systems-based practice
Diligence	Service orientation
Good judgment	Ethical responsibility
Reflexive thinking	
Approachableness	
Time-consciousness	
Discipline	
Self-care	
Responsibility	
Accountability	
Psychosocial balance	

Figures

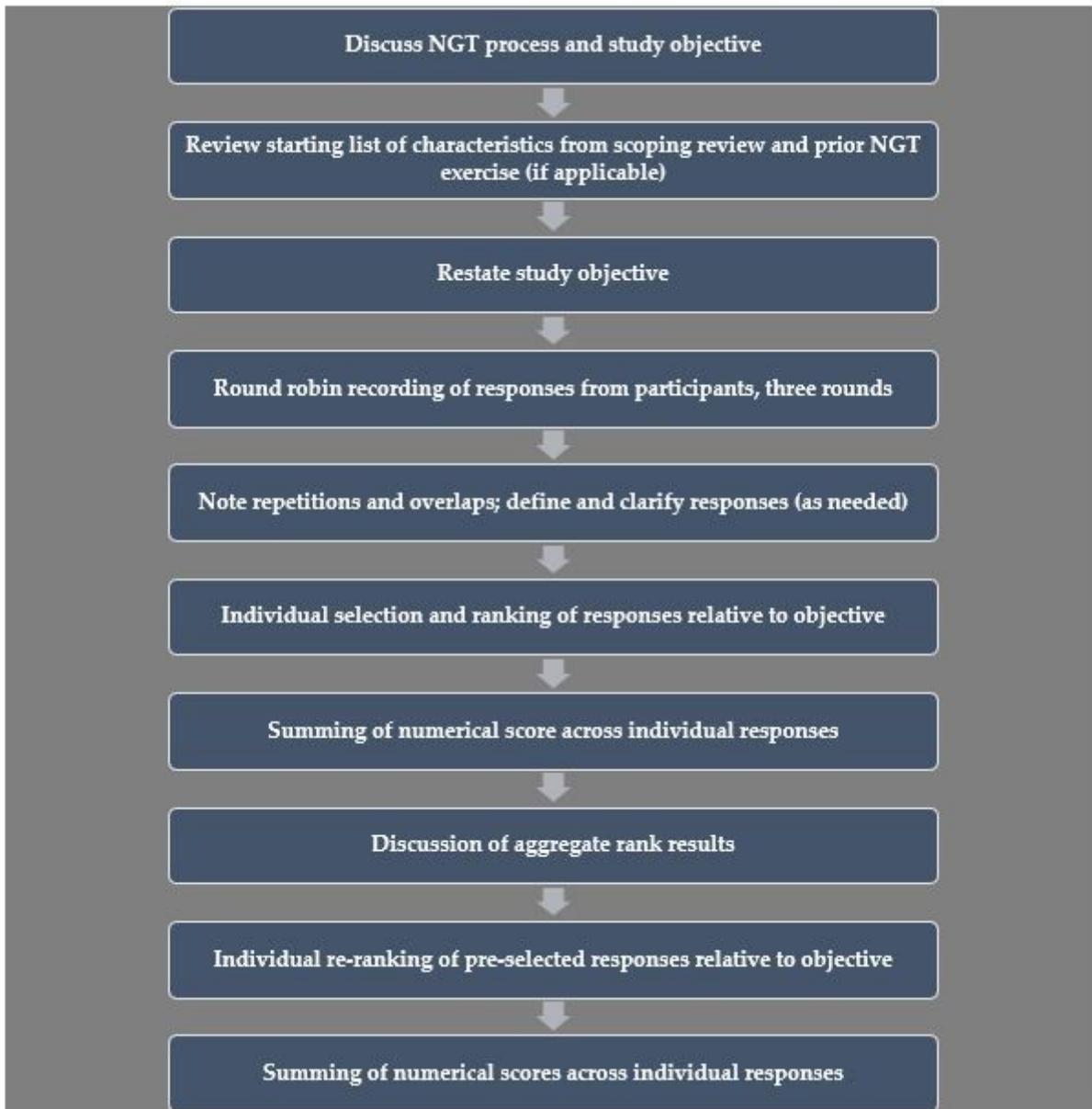


Figure 1

Overview of NGT process

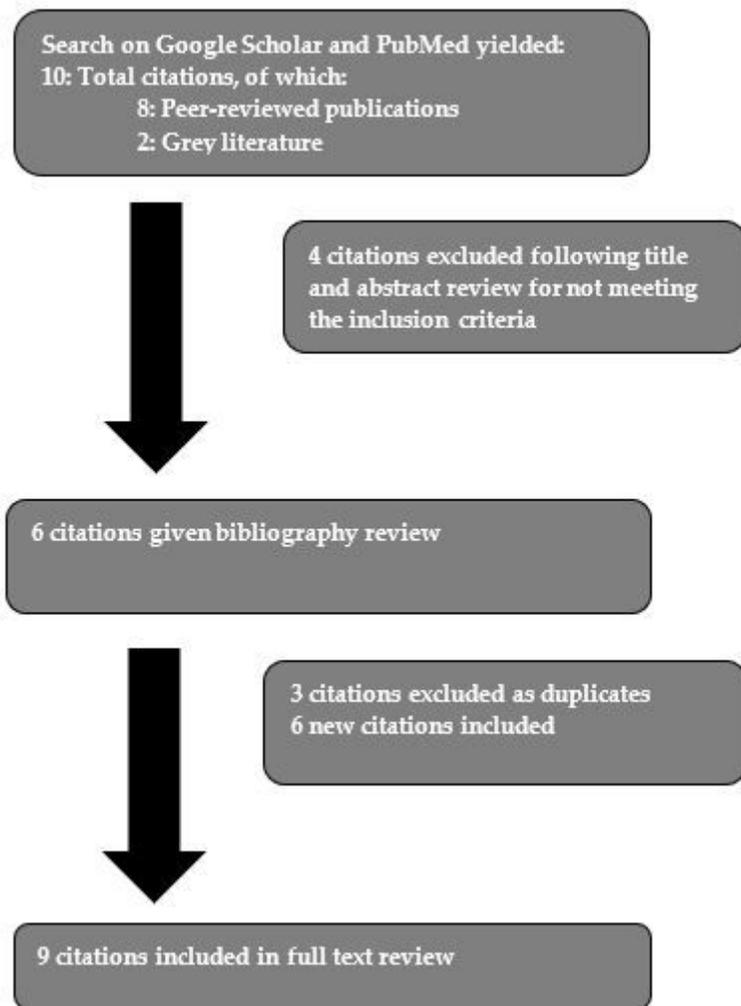


Figure 2

An overview of the results of the study selection process