

The impact of peer assisted learning on mentors' academic life and communication skill in medical faculty: A systematic review

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ABSTRACT

Peer assisted learning (PAL) was initiated to support the first-year students. In medical faculty, first-year students often find starting new academic life challenging. The impact from the peer mentors' aspect is not widely explore. The aim of this study was to review studies that reported the impact of PAL programs on peer mentors in medical faculty, particularly on their academic life and communication skill. The DOAJ, PubMed Central, SciELO, and Science Direct databases advanced search used to conduct a systematic literature searching. Systematic search was performed according to preferred reporting items for systematic reviews and meta-analysis (PRISMA) checklist recommendations. Five studies were included. All of the reviewed studies shown the impact of PAL programs on mentors' academic life. Three studies have shown both the impact of PAL programs on mentors on their academic life and communication skill. Studies in this review have shown positive impacts on mentors' academic life and communication skill. Good communication skills, empathy, leadership and teaching skills will promote individual abilities and skills as a doctor, be it as a practitioner, or as an educator.

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1. INTRODUCTION

Peer assisted learning (PAL) can be defined as a strategy in teaching in which individuals from similar social groupings who are non-professional teacher assisting one another to learn and learning themselves by teaching [1]-[3]. This is an educational technique where students learned from students. The program of PAL comprises of peer mentoring or near-peer mentoring; mentoring, tutoring, or didactic. The peer mentoring and near-peer mentoring programs are different by the relationship between students and mentor. The program is classified as peer mentoring if the mentor comes from the same academic year and ability. Meanwhile, if the mentor is a senior student, the program is termed near-peer mentoring. The mentoring, tutoring, or didactic programs are separated by the ratio of students. The mentoring program serves the mentor as a role model, provides a more intimate setting, and direct monitoring of student progress. This program requires 1:1 or 1:2 mentor to student's ratio and thus needs more mentor resource.

The tutoring program has one to 3-10 mentors to student's ratio, focused on curricula content, no needs more mentor resources, and the peer-teachers possibly to follow-up by university, but possible drawback for quiet students. The didactic program utilizes the least resource in which its mentors to student's ratio is 1:10. This program uses to minimal resources and teaches the peer-teacher, but limited for feedback, participation, and student interaction [4]. PAL is known as "cognitive congruence" which allows to share a similar knowledge base and learning experience, use language that their learners understand and explain concepts at an appropriate level, and "social congruence" because of their similar social roles so they feel more at ease with a peer- or near-peer teacher than with a senior clinician [5].

PAL was initiated to support the first-year students. In medical faculty, first-year students often find starting new academic life challenging [6]. PAL program, such as peer mentoring, enables them to adapt to the new academic environment and learning method [7]. They are urged to accomplish preclinical academic requirements. Reports on PAL programs implemented in medical faculty generally focused on the mentees' positive impact. Yet, the impact of the peer mentors' aspect is not widely explored. Therefore, we aim to review studies that reported the impact of PAL programs on peer mentors in medical faculty, particularly on their academic life and communication skill.

2. RESEARCH METHOD

This systematic review and narrative synthesis of studies assessing the impact of PAL on the academic life and communication skills of mentors was performed according to preferred reporting items for systematic reviews and meta-analysis (PRISMA) guidelines [8]. The directory of open access journal (DOAJ), PubMed Central, scientific electronic library online (SciELO), and ScienceDirect databases advanced search used to perform a literature searching. We used 'peer mentoring' AND 'medical student' AND 'academic' AND 'communication' keywords. The search filtered by the publication year: 2014-2019.

After elimination of duplicates, a preliminary selection on titles and abstracts was conducted. The next step is assessed full texts articles for eligibility Figure 1. Screening of the articles were done based on these inclusion criteria: i) population was medical student from developed or developing country; ii) exposure of interest was PAL program; iii) outcome was related to the impact of PAL program on peer mentors in medical faculty; iv) types of study were quantitative and qualitative. Joanna Briggs Institute (JBI)'s critical appraisal tools used to critically appraise the included articles. The data from the included articles were extracted and synthesized as descriptive .

3. RESULTS AND DISCUSSION

3.1. Study identification and selection

The database advanced search identified 1,101 articles. Articles gained were 978 from PubMed Central, 99 articles from Science Direct, 22 from DOAJ, and two from SciELO. Duplicate articles were removed. There are 1,064 not relevant articles removed. Twenty-five articles excluded exposure of interest was not PAL program and population was not from medical students. Five eligible articles were from studies conducted for medical faculty students in India, Australia, Israel, United States of America (USA), and Iran. The PRISMA flow chart is shown in Figure 1. Table 1 highlights the summary of the five eligible articles.

3.2. Findings

Study by Singh *et al.* evaluated the participants of the 2010 Mentoring Program in University College of Sciences, Delhi. Alongside 52 faculty mentors, 57 near-peers were assigned to mentor 148 first year medical students in the mentoring program. Feed-back questionnaire was given to the faculty mentors, near-peer mentors, and mentee at the end of the year. The feed-back from the near-peer mentors was made in the form of quantitative and qualitative analyses [9].

Sciocluna *et al.* studied the University of New South Wales' medical faculty students who engaged the 2012 peer learning program. The students from year one and two who completed courses in the first semester. The students were then combined as one cohort to complete courses in the second semester. They formed study groups where the senior became the mentors. Questionnaire for Peer Learning was given online to year 1-6 students. The questionnaire consisted of 26 fixed-response items with fourpoints Lickert scale (strongly agree-strongly disagree) and two open-ended items. The 1-12 fixed-response items and two open-ended items were answered by all students. The rest of the items were targeted according to academic year and peer teaching experience [10].

Dickman *et al.* reported a study on near-peer teachers of Bar Ilan University, Safed, Israel. The near-peer teachers were the first-year students of the Faculty of Medicine who had completed Anatomy course with grade at least 85 out of 100. They were trained in The near-peer instructors (NPI) program. The

Department of Medical Education and the Anatomy program create this NPI program. This program was run at the end of the second semester or on summer break. The students volunteered on a survey at the end of the program. The survey assessed to evaluating the satisfaction with the program and the teachers and also assessed the perceived value of the near-peer teachers. The near-peer teachers answered in five Lickert scale from 1 (lowest) to 5 (highest) [11].

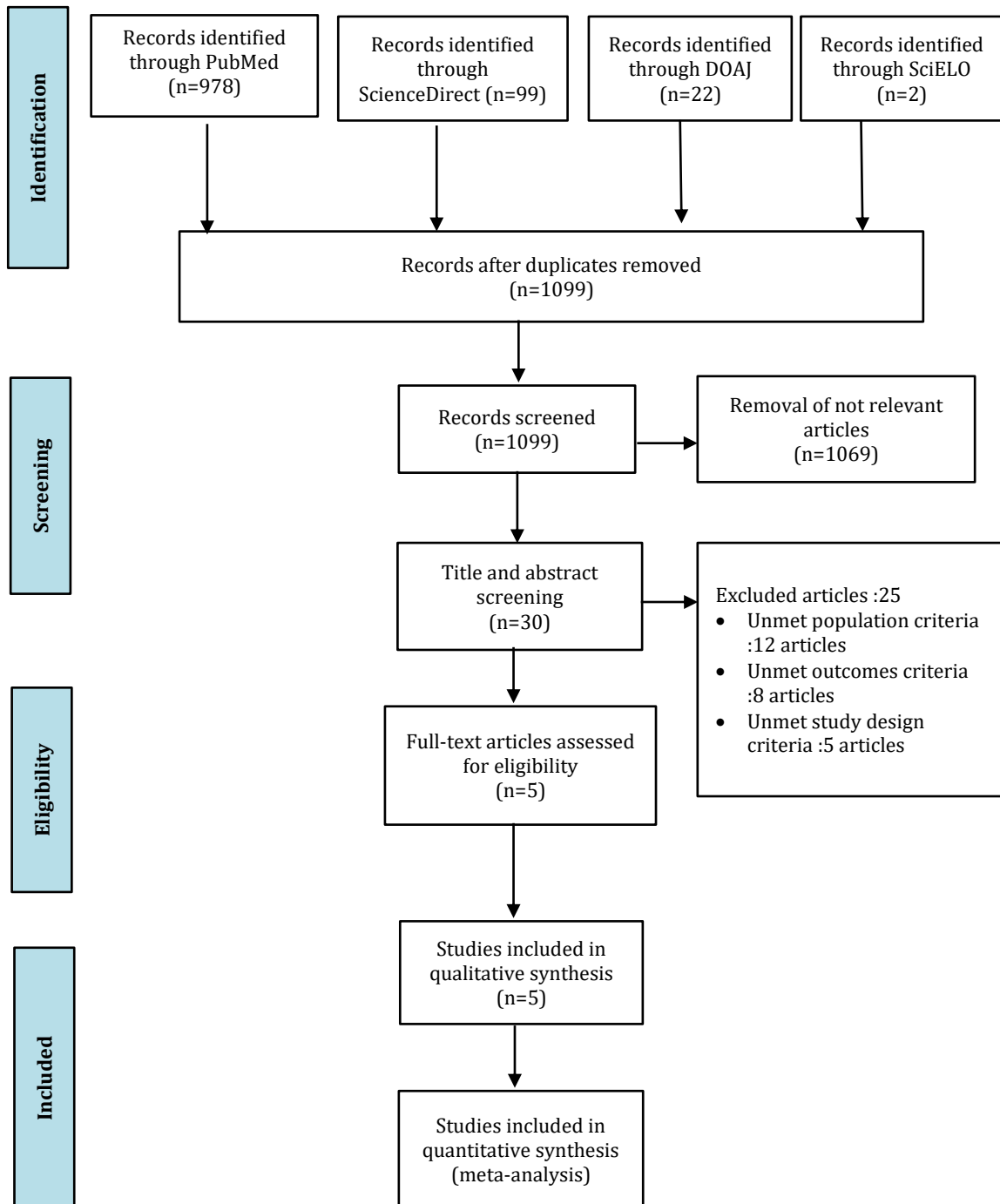


Figure 1. PRISMA flow chart of studies included in the systematic review

Table 1. Summary of eligible articles

Author	Year	Study participants	Country	PAL program	Study type	Data collection tool	Study findings on the impact of PAL on mentors
Singh <i>et al.</i> [9]	2014	52 faculty mentors, 57 near-peers mentors and 48 first-year medical students	India	Near-peer mentoring Program	Descriptive	Questionnaire-quantitative and qualitative data obtained	Increased reflective thinking, sense of altruism, understanding; building partnership; increased confidence, self-satisfaction, leadership, teaching, and communication skill
Sciocluna <i>et al.</i> [10]	2015	328 medical students in years 1–6	Australia	Peer Learning Program	Descriptive	Questionnaire-quantitative and qualitative data obtained	Maintained interaction; increased communication skill, confidence, understanding, knowledge, leadership; improved deep learning.
Dickman <i>et al.</i> [11]	2017	41 medical students	Israel	Near-Peer Instructors (NPI) Program	Descriptive	Questionnaire-quantitative and qualitative data obtained	Improved teaching skill and teaching style.
Andre <i>et al.</i> [12]	2017	880 medical students and 40 MiMs (Mentors in Medicine)	US	Mentors in Medicine (MiMs)	Descriptive-Analytic	Survey-quantitative data	Increased experience, mentoring skill, and leadership skill.
Abdolalizadeh <i>et al.</i> [13]	2017	12 medical students as mentors and 21 medical students as mentees	Iran	Dual Mentoring Program	Descriptive	Interviews-qualitative data	Developed patience, endurance, self-awareness, self-growth, self-reflection, team work, and sense of empathy; improved communication skill and sense of empathy.

Andre *et al.* studied the annual survey data of the vertical peer mentoring program in the University of Texas San Antonio School of Medicine. The vertical peer mentoring program was named Mentors in Medicine (MiMs). The program was set up as part of a student-advising program Veritas. MiMs were recruited from fourth-year students to complement faculty mentoring. The annual survey was performed to all students including the MiMs. It was composed by 16 items with 5 Lickert scale answers [12].

Study by Abdolalizadeh *et al.* analyzed the medical students who joined the dual mentoring program for undergraduate students of Tehran University of Medical Sciences. Focus group design of 21 mentees and 12 mentors was organized in 2012 after one year implementing the program. One of the components analyzed was the mentors' development [13]. The aim of this review is to understand the impact of Peer Assisted Learning on Peer Mentors in their academic life. What we need to underline is that academic life is not only comprised of the role of student and the act of studying in order to earn some scores and pass an exam or department. We can naturally find a common ground of agreement that 'life as a student' is Academic Life. Findings from the studies mention communication skills, empathy, counsel, confidence, problem solving, building relations, self-analysis of own mistakes, and leadership are among the things that mentors feel have improved in their life as a medical student while and after being a mentor to their peers and what those studies have concluded are as follows.

The response rate of the near-peer mentors was 52%. Most of the near-peer mentors (97%) thought that the student mentor program in Mentoring 2010 was beneficial to them. The advantage experienced by the near-peer mentors were dual mentoring, problem solving, responsibility, interaction, confidence, counseling, building relations, and self-analysis of mistakes [9].

Being mentors helped them increase their reflective thinking. They were reminded at the past time of what they should not do so they could advice their junior not to make the same mistake. By teaching their juniors, they could also learn the subject. They developed more respect to the faculty mentors. They had self-realization that they were living and not just studying in the university. Being mentors enabled them to have a sense of altruism and understanding. They thought that the peer-mentoring program's purpose was not only to be a problem solver for the mentees, but also to build partnership and mutual respect. They had sense of positivism and self-esteem. They were aware that their guidance could influence their juniors' decision and thus it should be very appropriate. They gained confidence and self-satisfaction when they knew that the mentee they taught could pass well. The peer-mentoring program brought through their leadership, concern, and goal setting. By reinforcing the near-peer mentor's own knowledge, mentoring has been reported to hone teaching skills a distinct advantage for medical students who are future residents and potential faculty members. Improvement in communication skills has also been reported as a result of mentoring activities; communication is an essential aspect of physician-patient interaction, and all efforts to enhance it would be welcome [9].

The peer-mentoring program helped the peer-mentors maintain interaction with their junior. The near-peer teachers believed that their skill to communicate effectively was improved by teaching their juniors. By maintaining interaction, they could enhance their communication skill. The mentors thought that they need innovation to better the communication with their juniors including those who were shy. 89.2% of second year students who had become near-peer teacher stated that they enjoyed teaching their juniors. 81.6% of them believed that near-peer teaching aided them to achieve more confidence. Nearly all of them (96.3%) felt encouraged to support their juniors. Most of them did not think that teaching their juniors slowed down their learning. The majority of the near-peer teachers (84.4%) felt that their understanding and knowledge of a topic were augmented by being near-peer teacher. This was also indicated by the qualitative data obtained from the 2 open-ended questions. Teaching their juniors promoted their deep learning. Year 4-6 students opined that teamwork in peer learning was an opportunity to hone their abilities such as leadership [10].

The survey for the students in the NPI program mainly focused on assessing the improvement of teaching skill and teaching style of the of the near-peer instructors. In 2013, students gave 3.75 ± 1.02 rating for the NPI program in being able to improve their teaching skill. In 2014 and 2015, the rating was 3.33 ± 0.71 and 3.50 ± 0.85 respectively. In being able to improve their teaching style, the students gave 3.70 ± 0.92 ; 3.56 ± 1.01 ; 3.14 ± 0.95 in 2013, 2014, and 2015 respectively [11]. The qualitative data showed that the students agreed that the NPI program enabled them to cultivate their teaching skills. It also built their universal competencies that would enhance their professionalism [11].

The response rate of MiM survey were 70.5%, 70.7%, and 77.4% in 2012, 2013, and 2014 respectively. All of the respondents in 2012 and 2013 survey were still willing to be MiMs compared to 91.7% in 2014. Survey in 2014 revealed that 71% of them strongly agreed that they were prepared to lead group meeting effectively. 85% strongly agreed that they could guide and advice their juniors. 81% strongly agreed that, on an individual basis, they were prepared to mentor their juniors. They believed that MiM elective could increase their MiM experience (77%), mentoring skill (83%), and leadership (80%) [12].

Abdolalazadeh *et al.* found that mentors had developed patience, endurance, self-awareness, self-growth, self-reflection, team work, sense of empathy during the mentoring program. Intermentor session made discussion and finding solution for the mentees possible. Content emotionally and satisfied to see their mentees passed. The mentors believed that communicating with several mentees with different behavioral and emotional characteristics, specifically 'difficult' ones strengthened their patience and endurance as well as self-awareness. Based on the mentors' perception, communicating with the mentees improved their social skills, particularly their communication skills and sense of empathy. In addition to interact with mentees, the mentors had some opportunities to inform the medical school administrative authorities about problems and concerns of the newly entered students, which resulted in developing an effective relationship with them. Communicating with school officials as well as participating in inter-mentor sessions improved the mentors' ability to criticize and provide feedback to others in an effective manner. They also declared that participating in the mentoring program improved their team-working skills [13].

Studies in this review have shown positive impacts on mentors' life in the academic environment. Program such as PAL has increased students' soft skills needed in their journey in pursuing their goal as a medical practitioner and/or educator and possibly even beyond. Skills such as communication, leadership, teaching/tutoring, confidence, reflective thinking, empathizing, the ability to develop a sense of altruism, and team work are amongst those highlighted by mentors when asked about their experiences in mentoring their peers. The interconnectivity between each aspect developed by mentors as they were involved in peer or near

peer mentoring would make our discussion too entangled from one aspect to another, so to avoid repetition of the same topic we narrowed down all of them into four main aspects: communication, empathy, teaching skills, and leadership where each aspect are supported by their own sub aspects. The chart that shows our frame of thought is shown in Figure 2.

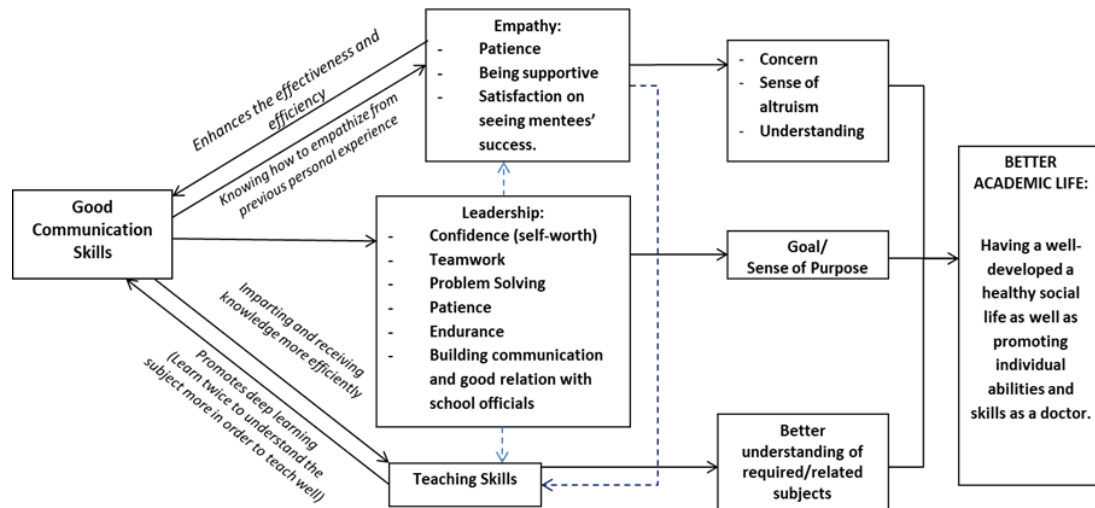


Figure 2. The four aspects developed by mentors during peer assisted learning (PAL) program

3.2.1. Good Communication Skills

Based on the results and discussions on reviewed studies, this study have found that Singh, Scicluna, and Abdolalizadeh all had strongly implied the benefit of peer mentoring program in developing students' communication skills. Supported by previous study with similar result [14]-[17], Singh *et al.* found in their studies that mentors developed improvement in communication skills as a result of mentoring activities, as the previous study [9]. Scicluna *et al.* found that teaching their juniors improved mentors' communication skills. The peer-mentoring program helped peer-mentors in maintaining interaction with their junior. Continuous interactions lead to improvement of their overall communication skills. Some circumstances forced them to be innovative to be better at communicating with their juniors, especially those who are shy [10]. Abdolalizadeh *et al.* supports these findings by stating that mentors had a perception that they improved their social skills, particularly communication skills and empathy. Mentors also had some opportunities to inform the medical school administrative authorities about problems and concerns of the newly entered students, which resulted in developing an effective relationship with them. Communicating with school officials as well as participating in inter-mentor sessions improved the mentors' ability to criticize and provide feedback to others in an effective manner. They also declared that participating in the mentoring program improved their team-working skills [13].

Dickman *et al.* and Andre *et al.* merely discussed or graced the topic of communication at a glance in their studies. Both studies only mentioned the importance and benefits of communication in learning through teaching experience without really acknowledging the changes in communication skills that mentors have throughout their experience as a mentor [11], [12].

Oxford English Dictionary states that "communication is imparting, conveying, or exchanging ideas and knowledge" [18]. This definition describes a general characteristic on the word communication, which is "a process of sharing, conveying ideas, and knowledge through a system or certain mechanism involving symbols, signs and behavior". In every day medicine practice, communication is the center, if not the heart and soul of the whole treatment regimen. The process of imparting and exchanging information and knowledge in medicine is to be applied as a methodical mechanism to extract information that the doctors need from patients-be it from anamnesis and/or physical examination, to arrive at a certain conclusion and form a diagnosis. If these series of information extraction mechanism is flawed or not thorough enough, the diagnosis and treatment would be entirely different from that of what it was intended. Even if the diagnosis was exacted properly, the wrong or inappropriate way to communicate how the treatment should go would lead the patient to interpret the 'doctor's order' differently, or leave their adherence toward the treatment plans that doctors have set up (not being disciplined enough to carry on the treatment regimen or leaving it all completely).

Better care and high-quality medicine for patients starts with good communication [19]. Doctors with good communication skills are more likely to make an accurate, comprehensive diagnosis and detect emotional distress in patients and respond to them appropriately; among others. Good communication with patients would ensure patients' satisfaction on the care they have received and less anxious about the problem involving their sickness. Good communication contributes to patients agreeing with and following advice given by doctors. This gives a hint on the importance of empathy in communication. Not only does good communication paves a path towards a better treatment, but also gives a positive impact on patients' physical condition [20].

3.2.2. Empathy

Empathy has been defined as having an understanding of and identification with the thoughts and feelings of another human being. As a consequence, empathy can describe a wide range of social phenomena, such as feeling concern for another person's situation, internalizing the perceived emotions of other people [21], discerning and accepting other people's motives or intentions, or adopting what others are perceived to believe or to be thinking. Such empathetic responses are thought to increase whenever a person has had a related previous experience, perceives a similarity between himself or herself and another person, receives explicit or implicit empathy training, and with the strength or salience of a personal association [22].

The capacity to take the perspective of others, to be sensitive to their inner experience and to engage with them compassionately, rather than simply sharing their emotions (sympathy) is one of the definition and keyword examples of empathy. In the medical context, empathy can be defined as "appreciation of the patient's emotions and expression of that awareness to the patient". Empathy was also as a cognitive ability in providing care, understanding and patient's perspective, and relates to communication skill in medical fields [23]. Researches have shown the positive outcomes associated with the quality of doctor-patient relationship and doctor-patient communication, and that empathy enhances both. More empathic students receive higher ratings of clinical competence and performed better on history-taking and standardized physical examinations. More empathic medical students and doctors received higher patient satisfaction ratings. Empathy can influence the patient to be able to increase patient satisfaction and compliance in the treatment process [24]-[26]. Patients judge empathy to be very important in consultations, and show better treatment adherence and greater enablement with more empathic doctors [27]-[32].

Doctors and medical care givers are amongst those individuals who are positioned by society as people who treat illness and comforts those who are in their care. It is not out of logic that these individuals are expected to have a high degree of empathy towards their fellow men, given their status. It is, however not always the case. Ethical erosion, a phenomenon where empathy and sympathy declines with increasing clinical experiences has been described in US medical students transitioning from pre-clinical to clinical training, and onwards into specialism and independent practice [33]-[39]. Workplace stress has been cited as a cause of ethical erosion amongst doctors, and increasing levels of clinical responsibility and fatigue secondary to workload are possible drivers of empathy decline [33], [34], [37], [39]-[42]. Having a strong and well developed sense of empathy in a medical student's character traits might help in giving an even better foundation for a more resilient sense of empathy in future doctors. And mentoring juniors or peers might be one of the ways to develop it in early years of medical education.

Based on the mentors' perception, communicating with the mentees improved their social skills, particularly their communication skills and sense of empathy. Mentors had to reflect on their own experiences and choose successful ones to solve similar problems of their mentees in order to help them. This in turn improved their own self-reflection ability. Mentors feel emotionally content and satisfied to see their mentees passed [13]. This finding by Abdolalizadeh *et al.* is also documented by Singh *et al.* where mentors felt that their self-reflecting thinking increased while and after teaching their mentees due to the fact that they were reminded by the past time of what they should not do and advised their junior not to make the same mistake [9].

3.2.3. Teaching skills

"*To teach is to learn twice.*" (Joseph Joubert) [43]. The quote above has a strong relatable essence with the theme discussed in this review. Findings in the journals we have reviewed highlighted the experience of teaching from the mentors' -be it peers or near peers, perspective. Not only do mentors had the experience to learn how to teach, they had to learn twice in order to teach their mentees well. A side effect from that is having better understanding on the subjects they were assigned to teach, mentors have earned a better way of explaining-imparting knowledge to their mentees.

As has been addressed by Scicluna *et al.* in their studies, mentors found that teaching their juniors promoted their deep learning. They felt that their understanding and knowledge of a topic were augmented by being near-peer teacher [10], [44]. This phenomenon has been studied in quite a number of studies. Among others reviews by Fiorella and Mayer, by Duran, and by Annette Burgess. The student tutor self-perceived

benefits such as tutors are driven to engage, analyse and verbalise what they know, and to realise and address their own knowledge gaps [44]. Compared to the students who only study, the students who teach their peers develop relatively more comprehensive understanding of a subject. This is confirmed by study findings by Fiorella and Mayer. They further state that the students who prepare and actually teach have more enduring comprehension that was measured through long-term assessment than those who only prepare to teach [45]. Duran discusses in his review whether teaching is an effective way to learn. The process of teaching comprises preparation, explanation, and feedback. When expected to teach, the students prepares a material to be presented. The students can transfer their knowledge by explaining the material to their peers. Explaining to others allows the students to deepen their learning by reviewing their knowledge and addressing their error. Further, the students can learn through teaching by offering the opportunity to build interaction with their peers. Interaction can be constructed via questioning their peers and giving feed back to the answers. Questioning and giving feed back benefit the student mentors/tutors through organizing their ideas to formulate question and feed back based on in-depth thinking reflecting to their own understanding and limitation [46].

3.2.4. Leadership

Singh *et al.* in their findings found that mentors developed better leadership skills. These mentors also developed a sense of concern and goal. Most near-peer mentors thought that the student mentor program in Mentoring 2010 earn them advantages in dual mentoring, problem solving, responsibility, interaction, confidence, counseling, building relations, and self-analysis of mistakes. Some gained confidence and self-satisfaction when they found out that the mentee they taught could pass well. On the other hand, Scicluna *et al.* found that near-peer teachers believed that teaching their juniors aided them in achieving more confidence. 96.3% of them felt encouraged to support their juniors. Andre *et al.* also emphasized the benefits earned by mentors are leadership skills. They found that 81% strongly agreed that, on an individual basis, they were prepared to mentor their juniors. They believed that MiM elective could increase their MiM experience (77%), mentoring skill (83%), and leadership (80%) [9], [10], [12].

Royal College of Physicians in 2010 stated that “*Our clear view is that doctors have for 25 years, perhaps longer, been failing to give the leadership of which they are eminently capable, and which society rightly expects of them.*” The General Medical Council in the 2009 version of Tomorrow’s Doctors stated: “*Medical students are tomorrow’s doctors. In accordance with Good Medical Practice, graduates will make the care of their patients their first concern, applying their knowledge and skills in a competent and ethical manner and using their ability to provide leadership and analyse complex and uncertain situations*” [47].

“*There is nothing in a physician’s education and training that qualifies him to become a leader.*” (Mathis, “*The Mathis maxims: lessons in leadership*”) [48]. This line from Mathis could not be far from the truth. Medical knowledge alone is insufficient to provide excellent medical care. The role of a physician goes beyond simply providing clinical care and encompasses a leadership role within the health care team, medical centre, profession, and community. Clinicians must master the necessary skills to cooperate and collaborate with other health care professionals and effectively lead a team in the patient-care environment and the larger context, of health care systems [49]. To be competent physicians, taking on peer mentoring leadership responsibility can further develop the skills needed such as enhance their communication, interpersonal, and leadership skills [50]-[52]. Studies carried out in the United States for leadership development were implicit rather than explicit and that leadership development was rarely the main purpose of the activity (O’Connell and Pascoe, 2004) [47].

Each study, research, and review always has limitations and this review is no exception. Our study focused on mentors' point of view, and impacts on mentors' life in the academic environment. While one of which the limitation is that we could only obtain free full-text journal publications. The other is of the language barrier, where we only selected English based articles. This means that our scope of review is relatively narrow.

4. CONCLUSION

Peer Assisted Learning Programs almost consistently give benefits towards mentee or junior students. The benefits include better academic achievements in their medical studies. Studies concerning the impact of Peer Assisted Learning Program, be it peer-mentoring or near-peer mentoring are rarely discussed. Students who are mentors felt that they were not merely being a student, but also living their life and having developed improvements in their academic life as a whole. Mentors have been found to have a better academic life in terms of social skills. Among them are communications skills, empathy, leadership, and teaching skills. These skills that would be the foundation and important modalities that would surely benefit them in their life as a doctor, be it as a practitioner, or as an educator.

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