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A longitudinal study on change in empathy in the first two years among medical students

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Abstract

Introduction: Change of empathy as students progress through medical school has been varyingly described with some studies reporting a decline and others little change. This study longitudinally assessed empathy change from the start of the first year to the start of the third year in a batch of medical students.

Method: This study was carried out at Patan Academy of Health Sciences which has adopted an innovative basic sciences curriculum comprised of medical humanities, problem based learning, rural residential postings, early patient interactions and longitudinal chronic patient follow-ups. Students in the intake of 2019-20 filled the Jefferson Scale of Empathy-Student version questionnaire at the start of first and third years. Participants provided voluntary informed consent. Institutional Review Committee granted ethical approval to the research.

Result: Fifty-three students who participated in the study at the start of the first year were followed up at the start of the third year. The mean(±SD) empathy score showed a significant rise at the start of the third year, 112.9(±8.7) compared to the score at the start of the first year 105.6(±10.5) with a rise of 7.2 points (95% CI=3.8-10.7), p-value<0.001. In males there was a rise of 8.6 points (95% CI=3.2-14.0), p-value=0.003 and in females 5.8 points (95% CI=1.3-10.4), p-value=0.014. The rise was also seen in some subgroups based on future-speciality choice.

Conclusion: This study showed a significant rise in empathy scores in the third year when compared to the start of the first year. This may be attributed to PAHS's innovative curriculum.

Keywords: Empathy; Innovative Curriculum; JSE-S; Longitudinal Study; Medical Humanities; Medical Student

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Introduction

Empathy, in the context of patient care, is described as a cognitive attribute which involves an understanding (rather than feeling) of patient's concerns and experiences, and an ability to communicate this understanding.[1]

It has been shown that empathy increases patient satisfaction and reduces the time taken to recover.[2,3] In the healthcare provider, it arouses an intention to help the patient in daily interactions, and it can improve job satisfaction and reduce the chance of burnout.[4,5]

Studies from the western hemisphere report a progressive decline in empathy as students progress through medical school with a sudden drop in the third year.[6,7] Studies in the Asian context, particularly Japan and India, have reported more stable levels of empathy as students progress through medical school but most of these studies are cross-sectional.[8-10] More recent longitudinal studies in India observed empathy levels declining in students as they reached their clinical year while another done in Japan reported no change.[11,12] No longitudinal study spanning several years had been carried out in Nepal to measure and track the levels of empathy in medical students.

The teaching of communication skills, problem based learning, creative arts, reflective writing, early clinical exposure and longitudinal patient follow-up starting during the basic science years are said to increase empathy.[13]

Therefore, this study was carried out to follow a cohort of students in a medical school in Nepal offering an innovative curriculum and measure their empathy levels as they progressed through the first two (basic sciences) years.

Method

This study was a part of the continuing longitudinal study of empathy which followed a cohort of medical students from the start of their first year to the start of their third year.

This study was carried out at Patan Academy of Health Sciences (PAHS). This institution is a public, not-for-profit, tertiary academic medical institution located in the city of Lalitpur, Nepal and is based at Patan Hospital which is the main teaching hospital for the academy. It is dedicated to improving rural health in Nepal by training health workers and also strives to serve as a model of innovative medical education in a developing country.

This study enrolled students in the Bachelor of Medicine and Bachelor of Surgery (MBBS) program at PAHS from the admission year 2019-20. These were the tenth batch of students enrolled in the institution. These students usually have finished 12 years of schooling before they are eligible to apply for medical school admissions. Students typically spend 1-2 years after grade 12 to prepare for the common entrance exam and are assigned to a given school based on their merit and choice. All 65 students in the particular admission year were invited to participate in the study. Students were first enrolled in the study at the start of the foundation block which is right after admission to PAHS and they were followed up just over two years later at the start of the third year. All participants were explained about the freedom to deny participation in the study.

The MBBS program under the School of Medicine at PAHS has incorporated many teaching-learning activities which may not feature in a traditional medical school curriculum. The Medical Humanities module within the introductory foundation course for first year students is a 16-hour-long module that explores diverse topics such as disability, the elderly, death and dying, social injustice, compassion and doctor-patient relationships through media such as art, photography, film, stories, essays and poetry.[14] Aside from the Medical Humanities module students are provided additional teaching in topics such as communication skills and ethics which are taught early in the first year. Students also undergo creative arts at the end of the cardiovascular system block when they are invited into an arts competition entitled 'My Heart'. The Introduction to Clinical Medicine (ICM) allows students to visit patients in the wards and practice history taking right from the first year. The Community Based Learning and Education Program (CBLE) is a teaching-learning method where students are posted to urban marginalized communities and rural communities. All the students are mandatorily exposed to the PAHS curriculum.

This study utilized the Jefferson Scale of Empathy-Student Version (JSE-S), a self-administered written questionnaire, developed to measure empathetic qualities and tendencies amongst healthcare students and professionals.[15] The Jefferson Scale of Physician Empathy was developed by a group of medical education researchers at Jefferson Medical College to fulfill the need of measuring empathy in the context of medical education and patient care. The JSPE was developed particularly to measure cognitively defined empathy. The scale has twenty items measured on a Likert type scale scored from 1 to 7 and ranging from Strongly Disagree to Strongly

Agree. To discourage a given respondent from passively and consistently choosing agree or disagree through all the items without much deliberation, 10 of the items are positively worded and directly scored whereas 10 of the items are negatively scored. There are three domains in the JSE-S, linked to perspective taking, compassionate care and standing in the patient's shoes. The total scores thus could range from 20 to 140. A higher value indicates a higher level of empathy.[16] The JSE-S was administered in English which is the language of teaching-learning at PAHS. All students were well versed in English. There is no separate Nepali version of the JSE-S. The JSE-S was first administered to the students at the start of the Foundation Course in the beginning of the first year in 2020. It was administered after a Medical Humanities Module in this course and it was again administered at the start of the third year when they had completed the two years of basic sciences and graduated to the third year in 2022. Alongside the JSPE, demographic information and information on the choice of specialty was also chosen. Students completed the questionnaire in one sitting in the first year, and one sitting at the start of the third year.

The 'Future Specialty' was defined as the medical specialty the first-year students wished to pursue after graduation. Future Specialty is categorized into three broad groups: 'People-Oriented' which includes internal medicine, pediatrics, obstetrics-gynecology, family medicine, and psychiatry; 'Technology and Procedure-Oriented' which includes surgery, neurosurgery, orthopedic surgery, and public health; and 'Undecided', for students unable to identify a future specialty. This broad grouping of specialty classification has been used in previous empathy studies.[18]

All data were cleaned after entering into Microsoft Excel and checked for discrepancies. The outliers were spotted with the box and whiskers plot and removed as necessary. All data management and analysis followed the JSE-S Professional Manual and User Guide.[17] The scores on the JSPE were computed as follows: ten positively worded items, linked to "perspective-taking" were scored directly (strongly disagree=1, strongly agree=7), whilst 10 negatively worded statement items were reverse scored (strongly disagree=7, strongly agree=1). Among the negative statement items, eight were regarding "compassionate care" and two concerned "standing in the patient's shoes". Descriptive analysis was carried out by the grouped mean scores. Empathy score were obtained for the whole cohort and subgroups using independent T-test and the ANOVA test. To compare the difference in scores between the first year and third year, paired T-test was used after first checking for normality in distribution.

Tests were considered significant at a p-value of ≤0.05. All analysis was conducted using the statistical software SPSS 20.

Informed consent was sought from all the students and participation was voluntary. There was no coercion or pressure as can happen when teachers are conducting a study on students. All participants understood that this was not a test but a research study aiming to measure and report finding related to empathy. All the entries in the final study dataset were anonymized with codes replacing names. All the data related to the study were kept securely with the study team. Ethical approval was obtained from the Institutional Review Committee, PAHS.

Result

All 65 (100%) students in the batch provided consent and participated in the study in the first year of which 3 (4.6%) were excluded due to being extreme outliers. Of the 62 students who were followed up in the third year only 53 (81.6%) students could be reached. There were 27 (51%) male and 26 (49%) female. All the students were between the age of 18 and 22 at the start of the study. The students were grouped into three groups based on which specialty they thought they would pursue in the future like described previously.[18]

There was no statistically significant difference in empathy score based on the preferred future specialty both at the start of the first year of medical school and at the start of the third year (Table 1). This similarity in scores could also be observed across both genders.

The empathy score of entire batch at the start of first year was 105.6±10.5 and at the start of third year was 112.9±8.7, (Table 2). The change could also be observed across both genders although the change is slightly lower for females compared to males.

Similarly, when grouping students by their choice of future specialty, a change was observed in the empathy levels of both the people oriented and procedure or technology oriented groups. The undecided group only had a slight increase which was not statistically significant (Table 3).

Discussion

This study which measured empathy scores among medical students who had just entered the third

Table 1. Comparison of future specialty group scores, at the start of first year and at the start of third year

Jefferson Scale of Empathy Timing of assessment	Subgroup of Future Specialty			p-value*
	People Oriented [Mean±SD]	Procedure or Technology Oriented [Mean±SD]	Undecided [Mean±SD]	
Start of first year (n=62)	107.3±9.5	103.1±9.8	109.0±11.6	0.143
Start of third year (n=53)	117.4±5.6	112.4±9.0	111.7±9.7	0.306

*One-way ANOVA; SD: standard deviation

Table 2. Comparison of scores at the start of first year and at the start of third year overall and by gender

	Start of First Year Mean±SD	Start of Third Year Mean±SD	Difference in mean	p-value*
Entire batch (n=53)	105.6±10.5	112.9±8.7	7.2	<0.001
Males (n=27)	103.9±10.9	112.6±9.9	8.6	0.003
Females (n=26)	107.5±10.0	113.3±7.7	5.8	0.014

*Paired Sample T-test for score comparison; SD: standard deviation; CI: Confidence Interval

Table 3. Comparison of scores at the start of first year and at the start of third year by each future specialty group

Future Specialty Group	Start of First Year Mean±SD	Start of Third Year Mean±SD	Difference in mean	p-value*
People oriented (n=8)	109.8±7.1	117.4±5.6	7.6	0.039
Procedure/technology oriented (n=30)	103.1±10.0	112.4±9.0	9.2	<0.001
Undecided (n=15)	108.6±12.0	111.7±9.7	3.1	0.384

*Paired Sample T-test for score comparison; SD: standard deviation

year and compared it to their empathy scores at the start of their medical school revealed that there was a significant rise in empathy levels as measured by the Jefferson Scale of Empathy. This study was the first study to follow students up over a period of two years and assess the changes in empathy levels in Nepal. Earlier studies on medical student empathy in Nepal were either cross-sectional[19] or only assessed empathy before and after a short course.[18,20]

The cross sectional study done across four medical colleges in Nepal[19] showed a difference in scores between various colleges, but the study did not assess the scores based on the year of education nor did it undertake a longitudinal follow-up. It was a non-random sampling of students in each college. Since there is a change in scores in our cohort between the first and third years we cannot make a comparison of score with this study which only measured empathy once but the students are in the final year. Nevertheless, the scores in the final year are lower than the scores of students in our study in both the first and the third year. It is difficult to know if scores declined for these students as they progressed through medical school.

In another study empathy was assessed before and after a short course in Medical Humanities using the Interpersonal Reactive Index(IRI) to measure it, and showed a rise in scores.[20] It is difficult to make comparisons when different instruments have been used. A previous study done by our group, which was an antecedent to this study, also showed a rise after a short course in Medical Humanities.[18] These studies do not document whether empathy changes were sustained over the long term. There have been no studies in the Nepali context which show changes in empathy over a period of two years. Nevertheless, these studies go on to show that curricular interventions can lead to a rise in empathy scores.

This consistency of empathy rise was observed in all the groups of students, those who preferred a people-oriented specialty, the students who preferred a procedure-oriented specialty and those who were undecided. Likewise, this consistency was observed in both males and females.

These finding are similar to the cross sectional study conducted in Japan which has shown that empathy scores in the final year was higher in comparison to empathy scores in the first year.[8] Other studies documenting an empathy rise in Japan attributed it to the incorporation of a Humanitude Care Methodology in medical education[21] or the teaching of communication skills.[12]

In contrast to this study there are other studies which have found no significant difference in empathy as students have progressed through medical schools

and other studies which have reported only a small decline. One study done in India showed that there was no statistically significant differences in empathy score throughout all the years of Medical School.[9] Yet another study which cross-sectionally examined empathy throughout all the years of a medical school and repeated the observations over several years showed that as the students became more senior their empathy levels declined.[22]

Empathy decline is said to start at the end of the third year in medical school. Unlike our study, there are several studies which report on the declining empathy levels as students progress through medical school particularly from the United States of America.[6,7] Some studies attribute this decline to the development of hedonistic characteristics while others claim that identification with a role model who is cold and uncaring but only concerned with the task at hand, emphasis on the technological(or scientific) rather than humanistic aspect of medicine and a sense of being a part of a privileged or elite group is said to be the cause of the declining empathy.[23] Medical students typically start dealing patients in the third year and that is perhaps the reason why these attributes take hold at that point.

The admission to medical school in the United States takes place after the college degree is obtained whereas in Nepal it typically happens one or two years after the end of high school. It may be that those with a more empathetic predisposition join medical school in the former setting but once they get into it their expectations are not met hence leading to a decline, whereas in the latter setting students are fresh and have not got rigid expectations and can be molded in medical school.

There are several reasons for a lack of rise in empathy scores. A focus on the biomedical side of medicine, lack of encouragement to be empathetic, and low amount of emotional capacity (i.e. low capacity to be empathetic), and the insurmountable complexity of patients-both their medical conditions and their socioeconomic conditions may be some of the reasons. A lack of role models and also the culture of cynicism and desensitization among medical students may also be the reasons for lack of empathy.[13] Additionally, fear of making mistakes, time pressure, lack of sleep, a hostile environment and a curriculum which is focused elsewhere may be some of the reasons why students focus less on the doctor-patient relationship. Stressful training may also be putting unrealistic demands on many students.[7]

At this stage it may be time to consider the questions: Does the curricular structure at the Patan Academy of Health Sciences lend itself to maintaining the empathy levels of medical students at PAHS? Can we conclude that the basic science course, the pattern of teaching-learning and the modality of examinations at PAHS is the educational intervention that is required to prevent a decline in empathy in the first two years of medical school?

PAHS has attempted to systematically inculcate humanistic attributes in its medical students. Most of the curricula for medical students in Nepal aim to teach the technological aspects of medicine and assume that humanistic qualities are gained automatically. In contrast, society expects that doctors possess these qualities. The notion that if empathy is to be expected then it has to be taught has gained a lot of traction in recent years[24] and there is also evidence that curricular interventions can lead to a rise in empathy.[25]

The curriculum at PAHS even in the first two years (basic science years) is oriented towards patients and communities. Community Based Learning and Education, the teaching-learning method that this employed, students are posted to areas where the marginalized people of society. They are also posted to observe rural health posts where basic medical care is provided along with health promotion and disease prevention activities. They undertake a community diagnosis posting in which they are posted to a locality where they undertake household surveys. The latter two of these postings are residential where students live with the locals in their homes for a few days, eating the food they eat and sharing the lives that they live. At the end of each posting they engage in reflective writing about their experiences.

Thus, through these postings students at PAHS are exposed to the biopsychosocial model of disease in contrast to the purely biological model of disease that is encountered during discussions of pathophysiology of an illness or the biomedical model during ward discussions. Awareness of the biopsychosocial model may have led students to be more empathetic.

It may be too early to draw conclusions from one study, clearly more data has to be gathered and comparisons have to be drawn across different medical curricula. There is need of evidence of educational interventions with control groups for comparison that show that training can indeed increase empathy.

Although the teaching-learning processes and the curriculum at PAHS have been designed in some

ways to target empathy it may still be premature to say that the curriculum structure has led to declines in empathy without a comparison. Future cohort studies should be carried out in different medical schools throughout Nepal and also in schools which have different curricula and teaching methods.

There are several limitations in this study. Empathy was measured based on students' scores on rating scale based on a self-administered questionnaire. The validity and reliability of JSE-S in a Nepali context also has to be assessed. Translation of this instrument to fit the Nepali cultural context may need to be carried out. Empathy has to be perceived by patients and their family, therefore, it has to be determined to what degree does the empathy scores measured here actually correspond to behavior in a clinical setting as experienced by patients. Additionally, the perception of co-workers, patients and managers who have worked with PAHS graduates can also be assessed to determine their levels of empathy.

This study has been carried out in only a single medical school. Without a control group for comparison, it may be unjustified to say whether the PAHS curriculum can be attributed to maintaining empathy levels.

A large number of students missing in the follow up at the start of the third year could also have affected study results.

Qualitative approaches such as interviews and possibly covert observations and other mixed method research approaches carried out among patients can be used to assess the empathy levels of their doctors or medical students.[23] Empathy instruments also have to be correlated with patients' perceptions and experiences of empathy.[26]

Lastly, most of the studies show a decrease in empathy levels in the third year or later. The final observation in this study was carried out just at the beginning of the third year. Therefore, the students in this cohort may yet face a decline in empathy levels.

Conclusion

This study showed a rise in empathy levels from the start of the first year of their training to the start of their third year. The innovative curriculum they were exposed to may have a role in the increased empathy levels. More robust studies must be carried out to document empathy levels in health professionals, its changes over the years and the reasons for those changes.

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Conflict of Interest

None

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Author Contribution

Concept, design, planning: RG, MS; Literature review: RG, MS, AA; Data collection/analysis- KGC, AA; Draft manuscript- AA; Revision of draft: RG, MS, KGC, AA, AHD; Final manuscript: AA; Accountability of the work: RG, MS, KGC, AA, AHD.

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