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Relationship of Scores of Empathy with Human Body Dissection and Gender among Undergraduate Medical Students of BPKIHS

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ABSTRACT

Introduction: Medical empathy is defined as the predominantly cognitive attribute that involves the ability to understand patients' experiences, concerns, and perspectives, and communicate this understanding with the intention of helping.

Objectives: The main aim of present study was to determine the relationship of human body dissection and gender with level of empathy among the first and third year undergraduate medical students of B.P. Koirala Institute of Health Sciences.

Methods: A cross-sectional study conducted on first and third years medical students between the periods of August 2020 to March 2021. "The Jefferson Scale of Physician Empathy-Student version" was used for assessment of empathy. Sample size of the study was 176 and the results were analyzed in Statistical Package for the Social Sciences, version 11.5. Student's t-test,ANOVA and bivariate correlation models were employed for statistical analysis. The p <0.05 was considered as the significant level.The respondent rate of questionnaire was 88%.

Results: The mean empathy score was found to be 88.13.The empathy score increased with increase of age (p<0.001) and year of course (p=0.066).The empathy score of Nepalese student was found to be lower as compare to Non–Nepalese student (p=0.016). The bivariate correlation analysis between empathy score and age was found to have positive correlation with statistical significant level (rs=0.270;p<0.001).

Conclusions: These results suggest that the empathy score of Nepalese students' increases with age and year of medical education.

Keywords: Clinical detachment; dissection; empathy; jefferson scale.

INTRODUCTION

Medical empathy has been defined as the predominantly cognitive attribute that involves the ability to understand patients' experiences, concerns, and perspectives, and communicate this understanding with the intention of helping.[1,2] The JSPE (Jefferson Scale of Physician Empathy) measures empathy in the context of medical education and patient care.[1]

Apart from imparting essential anatomical knowledge, the human dissection room can serve as an ideal ground for cultivating humanistic values among medical students.[3] Researchers have noted that while dissecting a human cadaver, students come across a myriad of emotional reactions which later on helps them to comprehend the psychosocial factors associated with patient's illness and thereby contribute to the making of empathetic physicians of tomorrow.[4]After an extensive search of the existing literature, we found that very few studies had explored the medical students' attitudes towards human body dissection or medical empathy or explored a relationship between both variables in Nepal.

Therefore, this study aimed to determine the relationship of human body dissection and gender with level of empathy among the first and third year undergraduate medical students of B.P. Koirala Institute of Health Sciences (BPKIHS), Nepal.

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METHODS

A comparative cross-sectional study was conducted from August 2020 to March 2021, at B.P. Koirala Institute of Health Sciences. The study was conducted after taking informed consent from medical students and ethical clearance (IRC/1764/020) from the Institute.All regular undergraduate medical students of first and third year of BPKIHS were included in the study. Students having past history or diagnosed with anxiety and stress disorders were excluded from the study.

The sample size was calculated by using the following formula, $n = 2SD^2(Z_{\alpha/2}+Z_{\beta}) / d^2$.In the study conducted at India (2014) , the mean score of empathy in two groups were 102.77 and 105.68 respectively with Standard deviation of 12.12.[5]

Whereas, n = minimum sample size per group;

SD=standard deviation from the previous study

$Z_{\alpha/2} = Z_{0.05/2}$

$= Z_{0.025/2=}$1.96 (from Z table) at type I error of 5%

$Z_{\beta} = Z_{0.20}$=0.842(from Z table at 80% power)

d=effect size=difference between mean value =-2.91

$n = 2X12.12^2(1.96+0.842)/(-2.91)^2$

= 97.21==Minimum 98 per group

Thus, the sample size of the present study was calculated as 196.In our institute, each year 100 medical students were selected. We had recruited all first and third year undergraduates Medical students who gave consent to participate in the study. Hence, the census sampling technique was used as sampling method.

The Jefferson Scale of Physician Empathy (JSPE) was designed to measure empathy specifically in medical students and physicians in the context of patient care.[6] The scale was originally developed by the researchers at the centre for research in medical education and health care at Jefferson Medical College, Philadelphia. We used revised JSPE (S) student version, for our assessment of empathy among our medical students. We obtained prior permission from the authorities of Jefferson medical college to use the scale. The scale was constructed on the basis of an extensive review of the literature, followed by the pilot studies with groups of practicing physicians, medical students and residents. The revised version contains self-reporting questionnaire having 20 Likert type items on a 7 point scale (1= strongly disagree to 7= strongly agree). It has scores ranging from 20 to 140. The higher scores are interpreted as more empathetic behavior. Several studies have supported the validity (construct, divergent, Convergent, criterion related) and reliability (Cronbach's coefficient alpha, test–retest) of the JSPE-S among medical students and physicians.[7]

We had distributed the JSPE-S questionnaire separately for two batches. For first year medical students, we had distributed the questionnaire just before first human body dissection practical session whereas for third year medical students who had already gained the experience of dissection, the questionnaire were distributed during the beginning of their third professional academic year. After providing proper instruction about the scale, adequate time was given for students to mark responses.

All statistical procedures were performed on Statistical Package for the Social Sciences version 11.5. Student's t-test, ANOVA and bivariate correlation models (Pearson correlation) were employed for statistical analysis**.** The $p < 0.05$ was considered as the significant level.

RESULTS

Out of total 200 students, 176 students responded to our questionnaire with a response rate of 88%. Maximum (62.5%) participants were less than 22 years of age. More than half (56.8%) participants were first year medical students having no experience of human body dissection. Around two-thirds of participants (67%) were male. Most of the students (70.5%) were Nepalese. In our study, 23.9% students plan to pursue internal medicine followed by 19.3% Surgery specialty in future. In medical sub-specialty, 40.5% students plan to pursue cardiology whereas in surgery sub-specialty, 47% plan to pursue cardiothoracic in future (Table 1).

Table 1: Distribution of different parameters recorded.

SN	Parameter	Number(N)	Percentage (%)
1	**Age**		
	<22	110	62.5%
	22-24	58	33%
	25-27	8	4.5%
2	**Year of Medical school** [a)]		
	First Year	100	56.8%
	Second Year	76	43.2%
3	**Gender**		
	Male	118	67%
	Female	58	33%
4	**Nationality**		
	Nepali	124	70.5%
	Non Nepali	52	29.5%
5	**Human Body Dissection**		
	No (not experienced)	100	56.8%
	Yes (experienced)	76	43.2%
6	**Specialty of interest**		
	Anesthesiology	3	1.7%
	Dermatology	8	4.5%
	Emergency Medicine	4	2.3%
	Internal Medicine	42	23.9%
	Neurology	14	8.0%
	Neurosurgery	26	14.8%
	Obstetrics/Gynecology	5	2.8%
	Orthopaedic Surgery	7	4.0%
	Pediatrics	3	1.7%
	Psychiatry	5	2.8%
	Radiology	10	5.7%
	Surgery	34	19.3%
	Undecided	15	8.5%
7	**Medical Sub-specialty** [b)] **of interest**		
	Cardiology	17	40.5%
	Critical Care/Pulmonary	4	9.5%
	General Internal Medicine	3	7.1%
	Gastroenterology	8	19.0%
	Hematology/Oncology	1	2.4%
	Infectious disease	1	2.4%
	Rheumatology	1	2.4%
	Other	2	4.8%
	Undecided	5	11.9%
8	**Surgical Sub-specialty** [c)] **of interest**		
	Cardiothoracic	16	47.0%
	General Surgery	12	35.3%
	Transplant	1	3.0%
	Undecided	5	14.7%

Values are presented as number and percentage. [a)] Total number of participants are 176.[b)]For those students who has selected internal medicine as primary specialty of interest. [b)] For those students who has selected surgery as primary specialty of interest.

The mean empathy score was 88.13. Empathy score increased with increase in age of students with statistically significant value (p<001).Third year medical students (89.53%) has higher empathy score than first year (87.07;p=0.066). Males has slightly higher empathy score than females (p=0.948). Non-Nepalese students has higher empathy score than Nepalese students with statistically significant value (p=0.016) (Table 2).

The bivariate correlation analysis between empathy score and age was found to have positive correlation with statistical significant level ($r_{s=}$0.270;p<0.001). Similarly, there was positive correlation with statistical significant level between empathy score and nationality of students ($r_{s=}$0.181;p=0.016) (Table 3).

Table 2: Descriptive table showing Mean (SD)

SN	Parameter	Mean Empathy Score (SD)	P-Value
	Total Empathy Score(ES)	88.13 (8.77)	-
1	**Age** <22 22-24 25-27	 86.70(7.80) 89.41(8.83) 98.50(13.02)	**<0.001****
2	**Year of Medical school** First Year [a)] Second Year [b)]	 87.07(8.88) 89.53(8.47)	0.066
3	**Gender** Male Female	 88.16(9.61) 88.07(6.80)	0.948
4	**Nationality** Nepalese Non Nepalese	 87.10(7.72) 90.58(10.55)	**0.016***
5	**Human Body Dissection** No (not experienced) Yes (experienced)	 87.07(8.88) 89.53(8.47)	0.066

Data are presented as Mean (SD) with p-value.[a)] First year medical students having no experience of human body dissection. [b)] Third year medical students having two years experience of human body dissection. P-value * <0.05, **<0.001.

Table 3: Bivariate correlation between different parameters.

	Age	Gender	Specialty	E.S	Nationality	Human Body dissection
Age	1	-0.092 (0.226)	-0.082 (0.281)	0.270** (<0.001)	0.261** (<0.001)	0.735** (<0.001)
Gender		1	0.053 (0.481)	-0.005 (0.948)	0.102 (0.176)	-0.050 (0.511)
Specialty			1	0.069 (0.364)	0.045 (0.556)	-0.104 (0.170)
E.S				1	0.181* (0.016)	0.139 (0.066)
Nationality					1	0.265** (<0.001)
Human Body dissection						1

Pearson correlation between different parameters. Data are presented as r_s and p-value. P-value * <0.05, **<0.001.

DISCUSSION

Experiences within the anatomy laboratory have the potential to give students the components of empathy to help shape their future practice of medicine.The medical school gross anatomy laboratory has often been referred to as a "rite of passage" for young physicians where they not only attain knowledge of the body, but also gain insight in teamwork, responsibility, humanism, communication, and empathy.[8] Dissection in the amphitheatre awakes interest and motivation towards acquiring new knowledge and positively modulates attitudes and emotions regarding death. Medical empathy is a complex construction including aspects of an individual's personal life with professional training and other individuals' experience.[9-11]

Previous reports had shown that the score obtained on a medical empathy test may become reduced with the passing of years spent in medical schooldue to factors such as stress, excessive workload and increased time spent on the medical studies.[12-14] The study conducted in Colombian medical students showed no relationship between attitudes about dissection and JSPE score.[15] Average score obtained by females was slightly lower than that for males in our study; this observation was disagreement to that reported in a sample of Colombian students[15] and Mexican students[16].The mean empathy score of medical students in BPKIHS was 88.13.This value was lower than that reported in Colombian[15] (113.34);Mexican[16] (110.2) ; American[17] (115) ;Pakistan[18] (90.63) and Japanese[19] medical students (104.3). The differences in the empathy score across the countries could be due to differences in cultural and social factors. Cultural background could also provide an explanation for the differences obtained between males and females.

Our study reported that the students who had done cadaveric dissection had higher empathic score than those who had not done dissection. The study conducted among Japanese medical students observed increase in empathy scores while progressing through medical school which was in agreement to our study but statistically not significant difference was observed in that study.[19] According to a study on empathy of medical school students in the U.S. conducted using the Jefferson Scale of Physician Empathy-Student Version (JSPE-S), the empathy scores declined significantly during their 3rd year, which was their first full year of clinical experience showing disagreement with our findings.[20] Another study conducted on South Korean medical students showed burnout levels increased significantly with medical students' rising seniority regardless of gender showing disagreement with our findings[21].Our study also reported that Non-Nepalese Students has higher empathy score than Nepalese Students which could be due to difference in cultural and social factors.

The study done at Oakland university reported significant difference between participants' feelings regarding the dissection experience building compassion and empathy in the lab ($p<0.001$). Before dissecting, most participants agreed dissecting a cadaver would build compassion and empathy. Yet, after dissecting, participants felt neutral or disagreed that dissecting a cadaver would build compassion and empathy. There was no significant difference when assessing the mean of empathy scores before and after the dissection experience through the Jefferson Scale of Empathy (JSE) ($p=0.399$) which was in agreement to our study ($p=0.066$).[8]

Involvement of only one university site and using only JSPE-S scale were major limitations of this study. In future, quantitative results gained in this study could formulate the new research questions, which should be further investigated by qualitative study methods regarding medical empathy. Qualitative studies could go deeper into this topic and help in constructing medical empathy tests and ways of measuring empathy. Attitudes about dissection should also be dealt with in more depth, as should how those can affect learning about anatomy and acquiring the values and attitudes necessary for professional performance.

CONCLUSIONS

The dissection course in gross anatomy can serve as one of the ways to develop the professional skill of clinical detachment and its balance with empathy .Our results suggest that the empathy score of Nepalese students' increases with age and year of medical education. This study suggested the comprehensive nature of empathy in undergraduate medical students can be assessed better by applying multi-dimensional empathy measurement tools. We suggest future steps in medical education to improve medical students' academic efficacy through various educational and non-educational interventions.

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Conflicts of Interest: None

NJHS

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