Attitudes of medical students in Khartoum, Sudan towards the doctor-patient relationship: a cross-sectional study

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ABSTRACT

Background/Objectives. Effective communication is a fundamental factor in creating a healthy doctor-patient connection that enhances patient satisfaction and outcomes. The doctor-patient relationship is essential to the delivery of high-quality medical care~~, and an essential means of establishing a healthy doctor-patient relationship is effective communication that allows for better patient satisfaction and outcomes.~~. This study aimed to assess the attitude of medical students in their clinical years~~,~~ at the University of Khartoum towards the doctor-patient relationship and ~~to~~ identify the factors associated with patient~~-~~centeredness.

Participants/Setting. The study was conducted on medical students in their clinical years from December 2020 to March 2021. The study sample consisted of 353 medical students from years 3 to 6.

Design. The cross-sectional study utilized the Patient Practitioner Orientation Scale (PPOS) for the measurement of student attitudes towards the doctor-patient relationship. PPOS scores are calculated as a mean score that ranges from 1 (indicating doctor or disease centered inclinations) to 6 (indicating patient centered or egalitarian inclinations). Medical students' demographic data were collected and included; gender, age and study year.

Results. 313 students completed the survey (response rate: 89%). The average total PPOS score and the ~~'Caring'~~caring and ~~'Sharing'~~sharing subscale scores for the entire cohort were 4.08 ~~(+/-~~± 0.53~~ SD),~~ 4.43 ~~(+/-~~± 0.58 ~~SD)~~ and 3.72 ~~(+/-~~± 0.72~~ SD),~~ respectively. Female gender ~~(p < 0.05) and later school year (p < 0.05) were~~was significantly associated with patient~~-~~centered attitudes. ~~Age had no association with PPOS scores.~~When compared to the start of their clinical curriculum, students' attitudes were significantly more patient-centered by the conclusion of their studies (P < 0.001).

Conclusion. ~~Medical~~ A decent level of patient-centeredness was demonstrated by medical students at the University of Khartoum~~ display a satisfactory level of patient centeredness~~ , and gender ~~plays a role~~had an impact on this quality. Additional consideration should be given to the ~~degree of~~finding that students' orientations were more patient~~ centeredness exhibited by an individual. More work needs to be done to address the fact that students were not as competent~~-centered in the caring dimension and less so in the ~~'Sharing' facet of patient centeredness as they were in the 'Caring'~~sharing one.

~~***Keywords*** Doctor-patient relationship, medical student, patient centeredness, patient centered care, PPOS.~~

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INTRODUCTION

The doctor-patient relationship is ~~essential~~critical to ~~the delivery of~~ providing high-quality medical ~~care, where an essential means of establishing a healthy~~treatment, and effective communication is a crucial component of creating a strong doctor-patient relationship ~~is effective communication that allows for better~~. This improves patient ~~satisfaction,~~ happiness and compliance and ~~affects~~has a favorable impact on health outcomes ~~in a positive manner.~~[~~[~~1~~]~~

~~Following the analysis of a number of recorded doctor~~]. Patient-centered communication gives the patient ~~interactions, it was deduced that seven different physician styles exist, with two significant extremes at each end of the spectrum. The extremes were dubbed~~ more power, including information, as well as a role and responsibility in decision-making [2]. It is now widely acknowledged that patient-centered ~~style vs a doctor-centered style. The difference in the definition of the two styles revolved around the extent to which power was shared between the physician and the~~care is an essential element for raising the standard of healthcare delivery, patient~~.[2,~~ care plans, and medical education [3~~]~~]. Shorter hospital stays, fewer problems, greater patient happiness and understanding, and a decreased risk of litigation are just a few of the quantifiable advantages of effective communication associated with patient-centeredness [4].

Various interpretations and definitions of patient-centeredness have been put forth over the years by researchers and scientists alike. It was also proposed that a patient-centered style is to be contrasted to a disease-centered one, where in the latter the physician employs a solely biomedical means of providing healthcare instead of attempting to relate to the patient and empathize with them [5, 6]. ~~It was therefore decided, that doctor~~Doctor-centered physicians ~~commanded~~command the visit by deciding what is talked about during the visit, not establishing a two-way mechanism of exchanging information, and ~~did~~do not allow patients to participate in decision-making, as ~~oppose~~opposed to patient-centered physicians that ~~were~~are eager to create a partnership with their patients and ~~to~~ allow patients to participate actively wherever their health ~~was~~is concerned.~~[4]~~

[5]. ~~Various interpretations and definitions of patient-centeredness have been put forth over the years by researchers and scientists alike, where it. It was also proposed that a patient-centered style~~

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~~is to be contrasted to a disease-centered one, where in the latter the physician employs a solely biomedical means of providing healthcare instead of attempting to relate to the patient and empathizing~~empathize ~~with them.[3,4]~~

~~As it happens there remains to be a role to doctor-patient congruence and incongruence, and conformity between patient's expectations and physicians perceived behavior in the satisfaction of patients.[3]~~

~~[5, 6]. In an attempt t~~To better understand the tendencies and orientations towards the various physician styles, a ~~previously v~~validated instrument known as the Patient-~~-~~Practitioner Orientation Scale (PPOS) has been developed to assess the extent to which people hold patient-centered attitudes. It is an 18-item instrument originally designed to be administered to either doctors or patients and measures ~~individual's~~individual attitudes toward the doctor-patient relationship along two dimensions termed ~~'Sharing'~~sharing and ~~'Caring'. [3,5]~~ caring [7].

~~The fact that medical students represent future physicians warrants the investigation of their attitudes towards the doctor-patient relationship so as~~Despite efforts by educators to ~~be able to identify the nature of the believes they hold towards the matter.[6]~~

~~The doctor-patient relationship is thought of as being the cornerstone for better delivery of care and improved patient satisfaction and in spite of educators' attempts to introduce~~ implement patient-centered curricula ~~that foster patient centeredness, a large body~~, there is a sizable amount of qualitative and ~~ethnographic data exists to suggest~~anthropological evidence to support the idea that the culture of medical education ~~focuses~~lays more emphasis on the biomedical ~~mechanisms~~mechanics than on the ~~issues central to patients'~~matters that are relevant to patients' preferences, ~~concerns~~worries, and emotions.~~[5]~~

~~While evidence suggests that by encouraging patients to take on an active role in their health care, which is promoted by physicians adopting a patient centered style of care, physicians can increase the effectiveness of their therapeutic activities.~~

~~That being said we find that an ever~~ [8]. A growing ~~population~~number of doctors and medical students ~~dismiss~~downplay the importance ~~and vitality~~ of patient-centeredness and disregard it in their ~~everyday~~daily practice ~~but reality remains to be that in order to warrant the best delivery of care, patient satisfaction with consequent better adherence to treatment and possible improved outcome of therapy ; there needs to be added attention to promotion of patient centeredness in medical schools~~, despite evidence that suggests that encouraging patients to take an active role in their health care can increase the effectiveness of doctors' therapeutic activities [4]. However, patient-centeredness must be encouraged as part of the ~~educational~~training curriculum~~.~~ in medical schools in order to provide the best care delivery, patient satisfaction, adherence to treatment, and possibly enhanced therapeutic outcomes [9]. Incorporating patient-centeredness into medical school curricula could help future doctors provide high-quality care and create efficient health systems, but doing so requires knowledge of the levels and trends in patient-centered attitudes that exist today [10]. Because medical students represent future physicians, it is necessary to investigate

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their attitudes toward the doctor-patient relationship in order to identify the nature of the beliefs they hold [11].

Various studies have come forth to describe the attitudes of medical students as they relate to patient-centeredness. Brazilian medical students were found to have strong patient-centered beliefs, as were their American counterparts, while Pakistani students had strong doctor-centered beliefs [11-13]. Scholars in America and Singapore discovered that gender was one of the factors influencing patient-centeredness [13, 14]. Other studies assessing medical student attitudes towards patient-centered care using the Patient Practitioner Orientation Scale (PPOS) have been conducted in Saudi Arabia, Mali, Greece, Sweden, China and Nepal [10, 15, 16, 17, 18, 19]. Studies of this kind in Africa have proven scanty to nonexistent, and thus hopefully this study will shed light on a highly under researched subject matter that forms the scaffold for better delivery of care and allow for the evolution of how the doctor-patient relationship is viewed by medical educators and medical students alike.

This study was conducted to find out more ~~on~~about the attitudes of medical students towards the doctor-patient relationship and hopefully achieve results that can support the demand for curricula that foster patient-centeredness. The aims of this study have been to: (1) describe the attitudes of medical students in their clinical years towards patient-centered care using the Patient Practitioner Orientation Scale (PPOS), and (2) determine if gender and academic year are associated with patient-centered attitudes.

~~Studies of the kind in the region have proven scanty to nonexistent and thus hopefully this study will have shed light on a highly under researched subject matter that forms the scaffold for better delivery of care and, allow for the evolution of how the doctor patient relationship is viewed by medical educators and medical students alike.~~

~~The aims of this study have been to: (1) to quantify and describe the attitudes of 3rd, 4th, 5th and 6th year medical students towards patient centered care using the patient practitioner orientation scale (PPOS) and (2) to determine the factors (gender, academic year, etc.) associated with patient-centered attitudes.~~

MATERIALS & METHODS

Study design and participants

We conducted a descriptive, cross-sectional study at the ~~faculty of medicine,~~ University of ~~Khartoum~~Khartoum's Faculty of Medicine, where ~~a 6 year undergraduate~~ the medical ~~curriculum is fostered.~~

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~~The faculty offers an undergraduate bachelor's degree in medicine to a total of 2,335 students, spread out across 6 years.~~

~~The~~ program ~~consists of~~is divided into 3 ~~years that constitute the Basic Clinical Sciences leg of the curriculum and are~~ pre-clinical years followed by ~~an additional~~ 3 clinical years ~~where the learning consists entirely~~. The majority of attendees are female. Clinical ~~Sciences.~~

~~It is worth noting that clinical~~ rotation ~~is introduced in the 3rd year of medical training, wherein students start attending occasional clinical rounds in two main subjects, namely; surgery and internal medicine.~~

~~Clinical round rotation then becomes more~~begins in the third year and grows increasingly regular and frequent as students ~~advance in~~progress through their medical ~~years, reaching its pinnacle in the 6th and final year of the medical~~ education ~~program.~~

. Participants were chosen ~~to be~~from among medical students in their ~~3rd, 4th, 5th~~third, fourth, fifth, and ~~6th year~~sixth years (clinical years) of ~~medical education whom have~~study who had received exposure to patients that ~~ranges~~ranged from ~~a~~ minimal to ~~a~~ full regular hands-on experience.

Instrument

Data were collected ~~by way of~~using a pretested, structured, close-ended, and self-administered, previously devised and standardized scale, ~~in addition to~~ as well as fields ~~aimed at the acquiring of~~designed to collect participant sociodemographic ~~data of participants.[7]~~

information. Pretesting (pilot survey) was conducted on 14 students chosen at random to test for questionnaire field understanding and practicality~~.~~

~~;~~; their results were not part of the final sample. The questionnaire consisted of a total of 21 fields that included, sociodemographic data~~;~~, with age, gender, and study year constituting the first 3 fields, respectively.

. An 18-item instrument, which uses a 6-point ~~Lickert~~Likert scale ranging from strongly agree (given a score of 1) to strongly disagree (given a score of 6), known as the Patient Practitioner Orientation Scale (PPOS~~)~~), was used to measure the students' attitudes toward the doctor-patient relationship~~.[7]~~

. Overall mean scores were calculated and could range from 1 (doctor-centered or paternalistic) to 6 (patient-centered or egalitarian~~). Scores higher than 3.5 indicate patient centered orientations.[8] In addition to a total~~) [7]. All questionnaire items presented were in the English language. Along with an overall score, the PPOS ~~measures~~gauges attitudes ~~towards~~regarding the doctor-patient ~~relationship along~~interaction on two subscales~~, namely; Sharing~~: sharing and ~~Caring.~~ caring. The ~~Sharings~~sharing subscale is composed of questions 1, 4, 5, 8, 9, 10, 12 and 15, while the ~~Caring~~caring subscale is composed of questions 2, 3, 6, 7, 11, 13, 14, 16 and 17 of the items constituting the questionnaire. The ~~sharing score measures~~responding individual's level of support for the ~~degree to which the respondent believes~~idea that ~~power and control should be shared between~~ the patient and the doctor should share authority and ~~patient.~~ decision-making is indicated by the sharing score. The caring score ~~measures the degree to which~~assesses how concerned a respondent is with the ~~respondent cares about the value~~importance of warmth and support in the doctor-patient ~~relationship and the degree to which the respondent~~

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believesinteraction as well as how strongly they feel that the doctor should inquireask about psychosocial matters.

Meanpsychological issues. The mean scores for each of the subscales were calculated for the nine items in each of the sharing and caring scales and could, as well, range from 1 (doctor-centered or paternalistic) to 6 (patient-centered or egalitarian).

Sampling and data collection

The survey was administered to 3rd, 4th, 5th and 6th -year students, all of whom had had varying degrees of clinical rotation. Students in these years were especially chosen since they represent the most experienced and mature students and because their opinions would be more carefully considered than those of their first- and second-year counterparts, who have had no clinical exposure. The corresponding total number of students enrolled in each year werewas as follows:: 350 students in their third year, 346 students in their fourth year, 311 students in their fifth year, and 325 students in their sixth year. SampleThe sample size was calculated using Slovin's formula, which amounted to 308 participants. The designated sample size of 308 was increased by an additional 15% to allow for the making up of non-responses encountered during the period of data collection, giving a sum total of 353 participants.

Systematic stratified random (probability) sampling technique was employed and applied to a database containing student names obtained from the faculty administration. An interval was calculated and run through the database for the selection of participants. 353 students were invited to participate by filling out an online survey, which was sent to targeted individuals on various social media platforms due to CovidCOVID-19 restrictions on accessibility to students. The survey consisted of 21 fields requiringand took an average of 5 minutes to be completedcomplete. Data werewas collected throughoutfrom late December of 2020 and intoto late January of 2021.

Statistical analysis

Data collected werewas cleaned and coded in a Microsoft Excel 2019 spreadsheet and thenbefore being entered into and analyzed usingwith the Statistical Package for Social Sciences (SPSS) version 23. DescriptiveThe descriptive statistics applied included; frequencies and percentages for the description of demographics as well as means for the average LickertLikert scale responses.

Probability Assumptions of normality of distribution were assessed using Kolmogorov-Smirnov test, and probability tests were performed to examine the relationships between PPOS scores, Caringthe caring and Sharingsharing subscale scores, and demographic variables. Student's t-test was run to examine the relationship between gender and Overallthe overall PPOS score, and that between gender and Caringthe caring and Sharingsharing subscale scores.

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The difference in means across different study years was compared using one-way ~~Analysis~~analysis of ~~Variance was~~variance (ANOVA) for both the overall PPOS scores and the ~~Caring~~caring and ~~Sharing~~sharing subscale scores.
~~Statistical significance was set as a p-value <~~ Post-hoc comparisons with the Bonferroni test were conducted to detect differences among the subgroups. P-values of 0.05 or less were considered significant.

Ethical approval

Ethical clearance was obtained from the Ethical Committee at the Department of Community Medicine, Faculty of Medicine, University of Khartoum. Ethics approval ID: 2/2022, Com.~~med.~~ Med. The objectives and purpose of the study were stated and explained in writing to every participant. Informed written consent was requested and obtained from all participants. The study was based on ~~"Do~~"do no harm~~"~~" principles. The participants were not identified.

RESULTS

Students from the academic years 3~~-~~–6 participated in this study (n~~=~~ = 353).
Of the ~~eligible~~ 353 students that were invited to participate, 313 ~~students~~ responded by completing the PPOS instrument, making up an overall response rate of 89%.
The majority of the participants were ~~females,~~ female (65~~%, while males made up the remainder 35% of the sample. The sample distribution by gender and academic year is shown in **Table 1.**~~ %). The participants' ages ranged from 20 to 27, and the mean age was 23~~.~~ ± 1.4. **Table 1** displays the distribution of students.

The average total PPOS score for the entire cohort was 4.08 ~~(+/-~~ ± 0.53~~ SD),~~ ranging from 2.39 to 5.56. ~~The distributions of overall PPOS scores by medical school year and gender are shown in **Figure 1.**~~ Higher PPOS scores indicate ~~a~~ more patient-centered and egalitarian attitudes towards the doctor-patient relationship.
The average ~~'Caring'~~caring score for the entire cohort was found to be 4.43 ~~(+/-~~ ± 0.58~~ SD),~~ while the average ~~'Sharing'~~sharing score for the entire cohort was 3.72 ~~(+/-~~ ± 0.72~~ SD).~~ **Table 2** displays PPOS and subscale scores by country. The total PPOS scores and the scores for the ~~'Caring'~~caring subscale and ~~'Sharing'~~the sharing subscale differed between males and females.

Female students were found to have a higher total PPOS score ~~(~~of 4.16 ~~+/-~~ ± 0.52~~ SD),~~ than their male counterparts (3.93 ~~+/-~~ ± 0.51~~ SD).~~). Females had also scored higher in the ~~'Caring'~~caring and ~~'Sharing'~~sharing subscale ~~domain~~domains. Upon further investigation, gender was found to be significantly associated with

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the total PPOS score (p= = 0.000), ~~'Caring'~~the caring subscale score (p= = 0.001~~)~~), and ~~'Sharing'~~the sharing subscale score (p = 0.006).
Table ~~2~~3 displays these results.

PPOS scores were also found to have differed across study years. Lower PPOS scores were observed among 3rd year students (3.76 ~~+/-~~± 0.52) than was observed among those in ~~6th~~6th year (4.31 ~~+/-~~± 0.50). With the exception of a slight drop in overall PPOS score in the 5th year, overall PPOS scores showed a steady rise, and ~~were~~the difference in means was found to be ~~significantly associated with medical school year (~~statistically significant (F = 14.7, p= < 0.~~000~~001). **Table ~~2~~3** displays these results.
~~Age, however, did not show a significant association with overall~~ Subsequent Bonferroni testing indicated higher PPOS scores~~.~~ in fourth (p = 0.001), fifth (p = 0.002) and sixth (p = 0.000) year students as compared with third year students. Sixth year students also demonstrated a significantly higher PPOS score than fourth (p = 0.020) and fifth (p = 0.008) year students, while there was no statistically significant difference in PPOS scores between fourth and fifth-year students (p = 1.000).

DISCUSSION

~~This study explored the attitudes of medical students in clinical years towards the doctor patient relationship using the Patient Practitioner Orientation Scale (PPOS), a previously validated instrument.[7]~~
To the best of our knowledge, this is the first ~~Sudanese~~ study to ~~assess the attitudes of~~be conducted in Sudan to evaluate medical ~~students towards~~students' perceptions toward the doctor~~-~~-patient ~~relationship~~interaction. Comparing Sudanese medical students' scores with scores from around the world allows for a more comprehensive understanding of the attitudes displayed by Sudanese medical students~~.~~

, where very little attention is directed to administering curricula that nurture and foster patient-centeredness and where the nature of medical practice is greatly impoverished in the cornerstones of ideal delivery of care. Our findings have shown that our sample of Sudanese medical students exhibit patient~~-~~-centered inclinations, as indicated by an overall PPOS score of 4.08. ~~Scores higher than 3.5 indicate patient centered orientations.[8]~~
Overall PPOS scores compared to those of students from different parts of the world are as follows~~:~~: Pakistan (3.40), China (3.63), Nepal (3.7), ~~KSA~~Saudi Arabia (4.00), ~~US~~America (4.57~~),~~) and Brazil (4.66~~).[4, 5, 7-10]~~

) [11-13, 15, 18, 19]. Medical students at the University of Khartoum have demonstrated patient~~-~~-centeredness in every possible domain~~:~~, including the overall PPOS, ~~Sharing~~sharing and ~~Caring~~caring subscales. Their scores varied ~~to~~from those of their Malian counterparts, which had been lower in all domains. Overall PPOS scores~~, Sharing~~ and ~~Caring~~sharing and caring subscale scores for Malian students were 3.38, 3.04 and 3.68, respectively, as ~~oppose~~opposed to the 4.08, 3.72 and 4.43 scored by our sample of Sudanese medical students in the same respective domains~~.[12]~~ [10].

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Females, ~~whom~~who have been known to score higher overall PPOS scores and are therefore associated with patient~~–~~-centered attitudes, were found to have higher scores than their male counterparts in this part of the world as well. ~~(Female students' overall PPOS score 4.16, Male students' overall PPOS score 3.93, p< 0.05).[5]~~
These findings have been consistent ~~to~~with what was found by researchers in ~~the US~~America, Singapore, China, Greece, Sweden, and Brazil, where females were found to have scored higher overall on the PPOS.~~[5, 8, 11, 13-15]~~

[12-14, 16-18]. In Pakistan and Nepal, however, females were found to have the same distribution of PPOS scores as males.~~[6, 9]~~ [11, 19]. The differences observed in this study between male and female overall PPOS scores and mean caring and sharing scores have shown that females tend to be more patient-centered as they've scored higher in all the corresponding domains, which is attributable to their better communication abilities [20].

The mean ~~Sharing~~sharing subscale score (3.72) was lower than ~~those~~that of medical students in Nepal (3.91), ~~KSA~~Saudi Arabia (4.2) and Brazil (4.10). ~~They were; however, higher than the scores~~However, they outperformed those of medical students in China (2.88), Mali (3.04~~),~~) and Pakistan (3.18~~).[6, 8-11, ~~) [10-12~~].~~
, 15, 18, 19]. While the mean ~~Caring~~caring subscale score (4.43) compared to those of other medical students' from around the world are as follows; Nepal (3.51), Pakistan (3.63), Mali (3.68), ~~KSA~~Saudi Arabia (3.8), China (4.53~~),~~) and Brazil (5.20~~).[6, 8-11, ~~) [10-12~~]~~
, 15, 18, 19]. These differences might be explained by religious, cultural, and socio-economic differences between countries. ~~Students~~, as every country varies in its nature of expressing empathy and the extent to which emotion and feeling are relayed [18]. How readily doctors communicate with their patients largely stems from cultural constraints governing the flow of information during the encounter, and as such, a more conservative community would have fewer opportunities for contact between people of different sexes, including patients and doctors, and would therefore greatly impact the quality of the exchange [15].

Our students scored higher in the ~~'Caring'~~caring subscale domain (4.43) than they did in the ~~'Sharing'~~sharing subscale domain (3.72), indicating that they are more interested in ~~Caring~~caring about their patients than they are in ~~Sharing~~sharing information with them.

This quality has also been exhibited by students in China where the culture there is known to prefer doctors who are more inclined to make "doctor-based" decisions on the patients' behalf taking into consideration their psycho-social status, this is unlike the Western culture which prefers doctors to more openly share items relating to the healthcare of patients.~~[8]~~ [18]. The finding of a higher mean caring subscale score could be explained by the possibility that students are aware of the patients' desire for empathy and the creation of connections that allow for mutual channels of understanding [21]. However, it is a widely held belief in Sudanese society that medical professionals must interview patients with the utmost authority or else their medical judgment will be questioned. As a result, decision-making is seen as being solely the responsibility of the doctor, and patient input is not necessarily valued. Such deeply ingrained ideas can make it difficult for our medical students to better express themselves in the sharing realm.

~~This finding of higher mean Caring subscale score could be explained by the fact that students might be aware of the importance of empathy and relating to patients in a way that establishes a bond which allows for mutual channels of understanding.~~

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Overall PPOS scores were also found to ~~be positively associated~~rise significantly with advancing school year (p =< 0.000). ~~With the exception of a very small dip in 5th year all other consecutive years have shown that overall PPOS scores had risen substantially. This finding is contradictory to~~This finding contradicts what was ~~found~~discovered among American ~~medical students~~ and Greek medical students ~~where~~, who saw a drop in overall PPOS scores ~~was associated with advancing~~as their school year~~. This finding;~~ advanced [13, 16]. It, however, was consistent with findings among students in Brazil, where it was reported that students' overall PPOS scores experienced a rise across consecutive medical school years and were therefore ~~highest~~higher among students of later years than they were among those in the earlier years~~.~~ [12]. Other studies have demonstrated no change in overall PPOS scores among students across consecutive school years. ~~Those~~These were the studies from Pakistan, Singapore, and Sweden, ~~where~~which all reported that ~~students'~~students' overall PPOS scores ~~were steady~~remained stable and ~~experienced no~~did not decline throughout their years of medical education, indicating that students ~~were~~did not ~~getting any~~become less or more patient~~-~~centered as ~~they advanced in the~~their years of medical education.~~[6, 13, 15]~~

progressed [11, 14, 17]. This positive association of overall PPOS score with advancing school year among our students suggests that as students advanced in their medical years, they ~~were growing~~became more and more patient~~-~~centered ~~and were in fact not~~, rather than drifting away~~, as was reported by Haidet and companions,~~ from the idealism they held ~~at~~in the earlier years of medical school as they ~~grew~~became more and more engrossed in the biomedical aspects of disease~~.[5]~~, as Haidet and colleagues reported [13]. The rise in patient-centeredness demonstrated by students may be attributed to their rising maturity and clinical exposure as they delve even further into clinical training, spend more time coming into contact with patients, and better appreciate the value of practicing ideals that would refine their encounter with patients and boost health outcomes.

Limitations

The ~~differences observed in~~ purpose of this study ~~between male and female overall PPOS scores, mean 'Caring' and mean 'Sharing scores have shown that females tend to be more patient centered as they've scored higher in all the corresponding domains which is attributable to their better communication abilities.[16]~~

~~This research~~ has ~~attempted~~been to ~~reflect the attitudes of~~capture medical ~~students in clinical years towards~~students' perceptions toward the doctor~~-~~patient relationship, but there ~~remains to have been short comings which when~~are still gaps that, if addressed in future ~~researches~~research on the same ~~subject matter~~topic, should allow for a more comprehensive exploration, assessment, and understanding of patient~~-~~centeredness among medical students. ~~The~~It's important to note that our study ~~was conducted on students from~~ has a number of limitations. Such limitations include a restriction to one medical school. It would be preferable if further studies included students from a number of medical schools to allow for a broader sampling.

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The ~~cross-sectional~~ nature of the study design does not allow for follow-up comparisons to be made, and thus future ~~researches~~researchers might want to consider longitudinal designs in an attempt to better understand the changes in patient-centeredness experienced by medical students as they evolve in their medical undergraduate years. Future research should try to look into medical students' real behaviors towards the doctor-patient relationship since the PPOS only measures attitudes and orientations towards that interaction, not actual behaviors.
~~The PPOS only measures attitudes and orientations of medical students towards the doctor patient relationship and not actual behaviors, future researches must attempt to investigate the behaviors of medical students towards the doctor patient relationship as well.~~

CONCLUSION

It has been found that the medical students at the University of Khartoum in their clinical years display a satisfactory level of patient-centeredness, and that gender plays a role ~~on~~in the degree of patient-centeredness exhibited by an individual, as has also been reported by other studies.

~~Patient centeredness was found to be positively associated with overall PPOS scores and thus~~ Our data also suggests that students are ~~getting~~becoming more patient-centered as their school year ~~advanced.~~

advances. It was also ~~shown~~demonstrated that more work needs to be done to address the fact that ~~students~~ students' orientations were ~~not as competent~~more patient-centered in the ~~'Sharing'~~caring facet ~~of patient centeredness as they were~~and less so in the ~~'Caring'~~sharing one, which ~~warrants~~calls for further investigation ~~as to~~into why these differences in scores ~~have come to~~ exist.
~~Close attention must be paid to the role of hidden curricula as it forms an indirect means of delivering implicit messages to students which might be a factor in driving away their patient centeredness, the unintentional indoctrination associated with the "Hidden curriculum" has been defined as influences that exist outside the formal medical education at an organizational and cultural level.[17]~~

~~Strengths & limitations of this study~~

1. ~~First Sudanese study to assess the attitudes of medical students towards the doctor patient relationship~~
2. ~~The study was conducted on students from one medical school.~~
3. ~~The cross-sectional nature of the study does not allow for follow-up comparisons to be made.~~
4. ~~PPOS only measures attitudes and orientations of medical students towards the doctor patient relationship and not actual behaviors.~~

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Acknowledgments

The authors would like to thank Dr. Edward Krupat for permitting the use of the Patient Practitioner Orientation Scale and for the very helpful material he shared with us, Dr. Elfatih Malik for his keen and constructive words and for the incredible heart and passion he puts into teaching, and all the students who participated in this study for their contribution to this work.

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