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ORIGINAL ARTICLE

Differences in history-taking skills between male and female chiropractic student interns

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ABSTRACT

Objective: The purpose of this study was to determine if there was a difference in history-taking skills between male and female chiropractic student interns.

Methods: This study included 2040 patient histories collected by student interns over a 3-year period. Students were assessed by chiropractic college clinicians on reasoning (ability to derive clinically relevant information using a mnemonic for taking a history), communication, and professionalism using a modified Dreyfus model scoring system on a 1–4 scale (1 = novice, 4 = proficient). Ordinal dependent variables were scores for reasoning, communication, and professionalism. The categorical independent variable was sex of the student intern (male or female). A Mann-Whitney U test was used to compare for differences in nonparametric dependent variables by the sex of the students.

Results: The Mann-Whitney U test revealed that communication scores were greater for female chiropractic interns compared with male chiropractic interns ($p < .001$, with a small effect size ($r = -.08$). There was no statistically significant effect for sex on reasoning ($p = .263$) or professionalism ($p = .098$).

Conclusion: Female chiropractic student interns scored higher than male interns on communication skills during a history-taking patient encounter. This supports the trend seen among female medical school students and physicians that women score higher than men on communication-related assessments.

Key Indexing Terms: Health Occupations Students; Health Communication; Empathy; Chiropractic; Education

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INTRODUCTION

History-taking is an important part of an initial patient encounter.[1] It is used to derive medical information that can guide subsequent healthcare provider decision-making to include asking secondary and tertiary questions that will guide subsequent care. An effective patient history has been shown to provide enough information to correctly diagnose a patient 70%–90% of the time.[2–4] It is not an easy skill to learn. Medical students report struggling with history-taking, and some students find it difficult to manage the emotional impact of patient interactions.[5,6] This supports the position that history-taking is one of the most critical skills for a healthcare provider to have.[7]

There are differences between how male and female healthcare providers interact with patients, which can impact the quality of the patient history-taking encounter.[8–12] Female doctors are more likely to have their patients be active decision-making partners, to be supportive, to ask psychosocial questions, and to engage them in psychosocial counseling.[8–12] Additionally, female doctors have been found to spend more time with their patients; their encounters last 2 minutes longer on average than those of male doctors.[8] These differences in communication skills may be partly responsible for the lower mortality rates of patients treated by female physicians.[13,14]

Communication and empathy play an important role in medical history-taking,[15–17] and are preferred traits that patients want to see in a healthcare provider.[18] Effective verbal communication is essential to derive pertinent information from the patient. Therefore, training in appropriate communication is a critical skill taught in medical programs worldwide.[19] Research on this topic has shown that female medical students score significantly higher than male students in verbal and nonverbal communication.[15] Effective patient communication affects patients' satisfaction, their likelihood to return for follow-up appointments, and their compliance with care recom-

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mendations.[20,21] Female physicians are less likely to interrupt their patients than male physicians, to provide clearer responses to patients' concerns, and to display empathy.[20,21] Empathy is defined as, "the ability to understand and share the feelings of another."[22] This attribute is essential for communicating effectively with patients during the history-taking process.

Research has further demonstrated differences between men and women in how they show empathy.[23] This is due in part to disparities in brain activity patterns, as well as to learned attributes that some researchers have theorized are linked to gender roles in society.[23] For example, women have been found to react faster than men to subtle cues in facial expression related to emotion,[24,25] as well as to bodily cues.[26,27] Similar differences in empathy have been noted between male and female medical school students, as well as between male and female doctors.[28,29] Increased empathy may not always be an ideal trait. Puffer et al theorized that greater empathy on the part of female doctors may be partly responsible for their significantly higher burnout rate than what is seen in their male counterparts; in other words, being empathic takes an emotional toll on a doctor.[29] This may partly explain the significantly higher suicide rate in female healthcare providers compared with their male colleagues.[30]

The objective of this study was to determine whether there are differences in performance on a history-taking assessment between male and female chiropractic student interns. The hypothesis was that female chiropractic student interns would score higher than male student interns on at least one attribute of the patient-history encounter.

METHODS

This research was reviewed and approved by the Texas Chiropractic College Institutional Review Board for human subjects in accordance with the Declaration of Helsinki. History-taking and patient assessment took place at the college's outpatient health center by upper trimester students in their final year at the college.

Chiropractic student interns take several medical histories during patient encounters throughout a trimester. During these encounters, the interns are graded by an attending clinician in the exam room on several skillsets using a modified 1–4 scale Dreyfus model.[31] The Dreyfus model is a generic scale for evaluating student proficiency on physical tasks from novice to expert. For this model, "1" represents "novice," unlikely to be satisfactory unless closely supervised. A "2" represents "advanced beginner," where straightforward tasks are likely to be completed to an acceptable standard. A grade of "3" represents "competent," where the action is fit for the purpose, though it may lack refinement. A "4" is "proficient," representing a fully acceptable standard that can be achieved routinely. A score of "5" represents "expert." The researchers deemed this score out of reach by students in this study. Students were graded on 3 skillsets: reasoning, communication, and professionalism.

The reasoning metric was measured by interns attempting to effectively gain clinically relevant history information from their patient during their history-taking encounter using a mnemonic. This common history-taking mnemonic is OPPQRST[32–34] that stands for: onset, provocative, palliative, quality, radiation, severity, and time. This mnemonic aids doctors in gaining information to help with the development of subsequent secondary and tertiary questions to refine the patient's chief complaint and ancillary health attributes. Evaluation of reasoning addresses the Council on Chiropractic Education's (CCE) meta-competency 1: Assessment and Diagnosis - Outcome 1.[35] Interns were scored on communication to address CCE Meta-competency 4: Communication and Record Keeping, Outcome 2.[35] Professionalism was scored to address CCE Meta-competency 5: Professional Ethics and Jurisprudence, Outcome 2.[35]

Data were collected from a convenience sample of 2040 patient histories taken by chiropractic student interns between May 2018 and May 2021. Scores were recorded by the attending physician using SurveyMonkey (Momentive, San Mateo, CA) and then exported to Excel (Microsoft Office, Redmond, WA). Participating interns needed to be enrolled in trimesters 8–10 of a 10-trimester program. The following attributes were collected for each encounter: trimester, student name, student sex, grader name, reasoning score, communication score, professionalism score, class designation (ie, clinic level I–IV), date, positive grader remarks, and negative grader remarks.

Data were analyzed using SPSS version 20.0 (IBM, Armonk, NY, USA). Results were reported as mean ± SD unless otherwise specified. Ordinal dependent variables were the interns' scores for reasoning, communication, and professionalism during their history-taking encounters. The categorical independent variable was sex of the student intern (male vs female). A Mann-Whitney test was performed to observe the relationship between each of the 3 nonparametric variables in relation to sex of the student intern.[36] An alpha level of $p < .05$ was considered statistically significant for all data analyses.

RESULTS

The analysis included 1006 histories recorded by male interns and 1034 histories recorded by female interns. The Mann-Whitney U test revealed that communication scores were greater for female chiropractic interns ($Mdn = 3.00$) compared with male chiropractic interns ($Mdn = 3.00$), $U = 474{,}774.00$, $z = -3.60$, $p < .001$, with a small effect size of $r = -.08$. There was no statistically significant effect for sex on reasoning ($p = .263$) or professionalism ($p = .098$). Table 1 compares data between the 2 study groups for reasoning, communication, and professionalism. Table 2 demonstrates some of the most common positive and negative remarks by graders for male and female student interns.

DISCUSSION

Completing a patient history requires a combination of effective communication and empathy. Good doctor-

Table 1 - Comparison of Scores for Reasoning, Communication, and Professionalism Between the 2 Study Groups on the Modified Dreyfus Scale. Data Listed as Mean ± SD

Attribute	Male Interns	Female Interns
Reasoning	2.82 ± 0.53	2.83 ± 0.54
Communication	2.86 ± 0.51	2.94 ± 0.51
Professionalism	3.04 ± 0.58	3.08 ± 0.56

Table 2 - Frequent Grader Comments on Female and Male Students Relative to "What Went Well" and "What to Improve" During the Patient-History Encounter

5 Most Common "What Went Well" Comments by Graders
Female Attributes
Professional
Good pace and calm nature
Great at connecting with patient
Great communication
Relatability, made patient feel comfortable
Male Attributes
Good clinical questions
Extremely detailed
Great rapport and speed
Confidence
Excellent follow-up questions
5 Most Common "What To Improve" Comments by Graders
Female Attributes
Get comfortable faster in the room
Focus on your confidence
Avoid leading questions
Don't be too comfortable in the room
Lead the patient encounter more
Male Attributes
Try to connect with the patient more
Don't repeat information you already know
Don't talk too fast, you were jumpy
No eye contact with the patient, looked at the computer screen a lot
Ask more open-ended questions

patient communication skills have been correlated with an increase in patient compliance, satisfaction, mental health, and quality of life.[37–40] Poor communication between doctors and patients has been shown to contribute to increases in malpractice lawsuits.[41,42] The importance of the aforementioned attributes has led to increased calls to improve patient communication skills in the curriculum of doctoral healthcare programs.[43,44]

Not only does effective healthcare provider communication help the patient, but it decreases the stress on the healthcare provider as well. Effective patient communication by healthcare providers has been shown to lower work-related stress and improve job satisfaction.[45]

Healthcare provider stress (as defined by the Centers for Disease Control and Prevention),[46] has been shown to be correlated with increased errors of judgement,[47] higher doctor burnout rates,[48] and rising suicide rates.[49]

Many factors can impact the differences in history-taking skills between female and male healthcare providers, including cultural norms and gender-stereotyped attitudes on the part of healthcare providers.[50,51] An example of gender-stereotyped attitudes could be a male doctor not taking a healthcare complaint of a female patient as seriously as a female doctor and vice versa.

The major finding of this study was that female chiropractic student interns performed better than male student interns on the communication attribute of a history-taking encounter. This trend aligns with existing research that female medical school students tend to score higher than male medical school students on communication tasks.[15,52] This appears to be a trend that continues into professional life, as has been seen in studies that compared communication between male and female physicians.[20,21]

Possible directions for future research that could stem from this study are: 1) Are there differences in history-taking skills between chiropractic vs allopathic students?, 2) Are patients more compliant and satisfied with female chiropractic doctors compared with male chiropractic doctors?, and 3) Do female chiropractic doctors have high burnout rates, similar to the rates found among female medical doctors?

A strength of this study is the large data set collected over 3 years involving thousands of patient-history assessments. This study cannot rule out grader bias on the dependent variables analyzed. For example, would a grader naturally grade a women student higher on communication skills because of any implicit positive gender bias that women are more effective communicators than men, based on traditional gender stereotypes?[53] This study did not collect data on the sex of the patient and did not measure gender discordance between the healthcare provider and the patient. For example, would a female student intern take a better history from a female patient than from a male patient? Preliminary research on this subtopic suggests there are minor differences in how a healthcare provider communicates with each of the sexes and on how this affects healthcare outcomes.[54,55]

CONCLUSION

The findings of this research study demonstrate that female chiropractic student interns are more effective communicators than male student interns, when taking a patient history. These findings match what has been seen among female medical school students and female physicians. Further study is warranted to determine the causes of these differences and possible countermeasures that chiropractic colleges could adopt to improve male student communication performance.

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