



## HEALTH STUDENTS' PERSPECTIVES ON PATIENT CONFIDENTIALITY AND RECORD-KEEPING ETHICS

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### ABSTRACT

**Background:** Various medical communities and associations have approved codes of ethics that place a significant emphasis on the importance of maintaining privacy and confidentiality. Students have been expected to respect patients' rights.

**Aim:** This study aimed to investigate health sector university students' level of knowledge and attitudes toward the importance of patient confidentiality of information.

**Methods:** The study utilized a convenient sampling method to select 402 health sector students from universities in Saudi Arabia. The study adopted a cross-sectional design, including all students studying health specialties at Saudi universities. The study was conducted for all students of health specialties at Saudi Universities. The study was performed from October 12, 2022, to February 20, 2023. The questionnaire consisted of three sections focusing on knowledge, attitudes, and demographic characteristics.

**Results:** Overall, most participating students have good level of knowledge (66%) and positive attitudes (53%) toward maintaining patient confidentiality.

**Keywords:** Confidentiality, Ethics, Knowledge, Attitudes, Patient Rights, Professional Patient Relations.

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## PERSPECTIVAS DOS ESTUDANTES DE SAÚDE SOBRE A CONFIDENCIALIDADE DOS PACIENTES E A ÉTICA DE MANUTENÇÃO DE REGISTROS

### RESUMO

**Antecedentes:** Diversas comunidades e associações médicas aprovaram códigos de ética que colocam uma ênfase significativa na importância de manter a privacidade e a confidencialidade. Espera-se que os estudantes respeitem os direitos dos pacientes.

**Objetivo:** Este estudo teve como objetivo investigar o nível de conhecimento e atitudes dos estudantes universitários do setor de saúde em relação à importância da confidencialidade das informações dos pacientes.

**Métodos:** O estudo utilizou um método de amostragem conveniente para selecionar 402 estudantes do setor de saúde de universidades da Arábia Saudita. O estudo adotou um design transversal, incluindo todos os estudantes que estudam especialidades de saúde em universidades sauditas. O estudo foi realizado para todos os estudantes de especialidades de saúde nas universidades sauditas. O estudo foi realizado de 12 de outubro de 2022 a 20 de fevereiro de 2023. O questionário consistiu em três seções focadas em conhecimento, atitudes e características demográficas.

**Resultados:** Em geral, a maioria dos alunos participantes tem um bom nível de conhecimento (66%) e atitudes positivas (53%) em relação à manutenção da confidencialidade do paciente.

**Palavras-chave:** Confidencialidade, Ética, Conhecimento, Atitudes, Direitos dos Pacientes, Relações Profissionais com os Pacientes.

## PERSPECTIVAS DE LOS ESTUDIANTES DE SALUD SOBRE LA CONFIDENCIALIDAD DEL PACIENTE Y LA ÉTICA DE MANTENIMIENTO DE REGISTROS

### RESUMEN

**Antecedentes:** Varias comunidades y asociaciones médicas han aprobado códigos de ética que ponen un énfasis significativo en la importancia de mantener la privacidad y la confidencialidad. Se espera que los estudiantes respeten los derechos de los pacientes.

**Objetivo:** Este estudio tuvo como objetivo investigar el nivel de conocimiento y actitudes de los estudiantes universitarios del sector salud hacia la importancia de la confidencialidad de la información del paciente.

**Métodos:** El estudio utilizó un método de muestreo conveniente para seleccionar a 402 estudiantes del sector de la salud de universidades de Arabia Saudita. El estudio adoptó un diseño transversal, que incluye a todos los estudiantes que estudian especialidades de salud en las universidades sauditas. El estudio se llevó a cabo para todos los estudiantes de especialidades de salud en las universidades sauditas. El estudio se realizó entre el 12 de octubre de 2022 y el 20 de febrero de 2023 y constó de tres secciones centradas en el conocimiento, las actitudes y las características demográficas.

**Resultados:** En general, la mayoría de los estudiantes participantes tienen un buen nivel de conocimiento (66%) y actitudes positivas (53%) hacia el mantenimiento de la confidencialidad del paciente.

**Palabras clave:** Confidencialidad, Ética, Conocimiento, Actitudes, Derechos del Paciente, Relaciones profesionales del paciente.

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## 1 INTRODUCTION

Different medical communities and associations have approved codes of ethics that place a high emphasis on privacy and confidentiality<sup>1,2</sup>. Confidentiality is a fundamental aspect of legal health records and an ethical foundation for providing exceptional care<sup>3</sup>. Patients' rights to confidentiality are emphasized in religious texts, the Hippocratic Oath, and nearly all contemporary code of ethics<sup>4</sup>. The term "confidentiality" has a narrower meaning, referring specifically to the protection of personal information and the obligation of healthcare professionals not to disclose information without the patient's consent. Confidentiality is often used interchangeably with the term "informational privacy"<sup>2</sup>.

Confidentiality is a key virtue in building trust between healthcare providers and patients. Health professionals have a legal duty to ensure the handling of patient data in a private and secure manner<sup>5</sup>. Students in the healthcare field are expected to respect patients' rights to confidentiality, and they should also be aware of the consequences of breaching patient confidentiality<sup>6</sup>. Confidentiality refers to limiting access to personal information to authorized individuals and following authorized procedures at appropriate times and in approved manners<sup>7,8</sup>. Respecting patients' confidentiality means keeping privileged communication confidential and not disclosing it without the patient's consent<sup>9</sup>. The principle of respect for autonomy is commonly discussed in the context of health care interventions, but it is also relevant to issues such as confidentiality, fidelity, privacy, and truth-telling<sup>10</sup>.

Focusing too narrowly on decisions regarding health care interventions can cause other situations involving patient autonomy to be overlooked<sup>11,12</sup>. Recent studies have explored the attitudes of medical students and operating room nurses towards patient privacy, and the findings indicated that both groups had negative attitudes towards privacy and confidentiality issues<sup>13,14</sup>. For that, the aim of the current study is to investigate health sector university students' level of knowledge and attitudes toward the importance of patient confidentiality of information.

## 2 METHOD

### 2.1 STUDY DESIGN

Cross-sectional analytical study. The study conducted for all students of health specialties at Saudi Universities. The targeted sample composed of those who have completed



the first year of their bachelor's degree "Preparatory year". The study was performed from October 12, 2022, to February 20, 2023.

## 2.2 DATA COLLECTION METHODS

A survey was sent out to health students in various Saudi Arabian universities through different online platforms such as emails, Twitter, Facebook, and text messages. The Ministry of Higher Education reports that there are approximately 21,000 health sector students in all universities in Saudi Arabia. We used a nonprobability sampling method and determined that a minimum of 400 participants was necessary by calculating the sample size with a 95% confidence interval and a 5% margin of error.

## 2.3 DATA COLLECTION INSTRUMENT

The survey used in this study was selected after reviewing similar literature<sup>6,3,15</sup> The data collection instruments were a demographic questionnaire and a self-administered questionnaire created by Hosseini Ghavamabad et al. in 2019<sup>13</sup>, which was modified by Karasneh R in 2021<sup>16</sup>. The questionnaire consisted of two sections: Knowledge, which had seven multiple-choice questions, and Attitude, which had 14 statements on a 4-point Likert scale. In the knowledge section the participants could respond with "yes," "no," or "I don't know." Participants received two points for each correct answer and one point for each incorrect response, resulting to a total knowledge score of 14. The knowledge section was scored from 7 to 14, with a higher score indicating greater knowledge about patient data confidentiality. To analyze knowledge, the number of correct answers was calculated as the sum score for each respondents. A mean of seven questions regarding knowledge of patient confidentiality was calculated, and those who scored above the mean were classified as having "good" knowledge, while those who scored below were classified as having "poor" knowledge<sup>16</sup>.

The attitudes section of the questionnaire consisted of 14 questions, which were scored on a 4-point Likert scale ranging from "never" to "always." This section was scored from 14 to 56, with a higher score indicating greater confidentiality regarding patient data sharing. To analyze attitudes, the correct direction of the attitude for each question was determined. A mean of the 14 questions related to attitudes toward patient confidentiality was calculated, and those who scored above the mean were classified as having a "favorable" attitude, while those who



scored below the mean were classified as having an "unfavorable" attitude, according to Entwistle VA in 2010.

#### 2.4 VALIDITY AND RELIABILITY OF THE INSTRUMENT

The questionnaire's knowledge and attitude sections had face, content, and construct validity, and confirmatory factor analysis confirmed the appropriateness of all questions to collect data. The survey was pilot tested on 21 participants who were not part of the study sample. The Cronbach's alpha values were calculated to be 0.79 and 0.89 for the knowledge and attitude sections, respectively, indicating acceptable internal consistency and reliability. For the whole questionnaire, the Cronbach's alpha value was 0.83, further indicating acceptable internal consistency and reliability.

#### 2.5 ETHICAL CONSIDERATIONS

The study adhered to the Helsinki Declaration and received ethical approval from the authors' Institutional Review Board (IRB) (Ref. No. [REDACTED]). No identifying personal information such as names or addresses was collected from the participants.

### 3 RESULTS

The study survey was completed by 402 students from seventeen Saudi universities with varying study levels in the health sector. As for the time of admission, 86 (21.4%) students joined the university in 2018-2019, while 102 (25.4%) joined in 2019-2020. In terms of specialization, 191 (47.5%) students came from colleges of medicine, and 127 (31.6%) from colleges of nursing. In terms of universities, most of the kingdom's universities are represented. In terms of gender, 274 (68.2%) of the participants were females, while 128 (31.8%) were males. Of the participants, 108 (30.1%) had GPAs between 4 and 4.49, while 121 (30.1%) had GPAs between 4.5 and 5. Three hundred and sixty-eight (91.5%) of the students were single. Direct contact with patients was experienced by 331 (82.3%). The number of students who received ethics courses in dealing with patients is 346 (86.1%). A total of 205 (51%) attended private courses related to ethics. A total of 14 (53.2%) participants had experience with ethical dilemmas.



**Table 1**  
*Demographic Characteristics*

Item	Frequency	Percent
<b>Age (Total 402 participants)</b>		
Mean 22.07 ± 1.95		
<b>The university entrance year</b>		
2015-2016	21	5.2
2016 - 2017	52	12.9
2017 - 2018	47	11.7
2018-2019	86	21.4
2019-2020	102	25.4
2020 -2021	69	17.2
2021-2022	25	6.2
<b>Specialty</b>		
Dental	2	0.5
Diagnostic radiology	2	0.5
Lab	3	0.7
Mechanical production	1	0.2
Medicine	191	47.5
Nursing	127	31.6
Nutrition	12	3.0
Pharmacy	16	4.0
Public health	40	10.0
Radiology	7	1.7
Respiratory therapy	1	0.2
<b>University</b>		
Al Baha University	7	1.7
Al-Jouf university	46	11.4
Almoosa college	2	0.5
Batterjee Medical College	1	0.2
Bisha University	22	5.5
Hail	45	11.2
mam Abdulrahman Bin Faisal University	10	2.5
Jeddah	2	0.5
Jizan University	3	0.7
King Abdulaziz University	105	26.1
King Fasil University	42	10.4
King Saud bin Abdulaziz	57	14.2
King Khalid University	2	0.5
Najran	52	12.9
Tabuk	2	0.5
Taif University	3	.7
Vision colleges	1	.2
<b>Gender</b>		
Female	274	68.2
Male	128	31.8
<b>GPA's for last academic year</b>		
2.5 - 2.9	34	8.5
3 - 3.49	55	13.7
3.5 - 3.99	84	20.9
4 - 4.49	108	26.9
4.5 - 5	121	30.1
<b>Marital status</b>		
Divorced	4	1.0
Married	28	7.0



Single	368	91.5
Widow	2	0.5
<b>Experience of direct contact with the patients?</b>		
No	71	17.7
Yes	331	82.3
<b>Receiving ethics courses in basic study about medical ethics?</b>		
No	56	13.9
Yes	346	86.1
<b>Attending any private training courses about medical ethics?</b>		
No	197	49.0
Yes	205	51.0
<b>Did you have previous experience with an ethical dilemma?</b>		
No	188	46.8
Yes	214	53.2

Table 2 illustrates the students' knowledge about confidentiality of patient information. Among the seven questions, the highest score was obtained in the first question about *"Does confidentiality governed by law?"*. The majority of participants (66.7%) said "yes" giving a mean score of  $1.67 \pm 0.47$  out of 2. The following question was *"Does non-medical information considered confidential?"* where the majority (61.7) answered "yes" giving a mean score of  $1.62 \pm 0.49$  out of 2. In general, the results show that the percentages of participants who were able to answer each question correctly were higher than those who gave wrong answers, except for question six *"Can patient confidentiality be breached if the disease contagious?"*. The majority (55.5%) of participants answered "yes" which lowered the mean score of that question to  $1.29 \pm 0.45$ . The mean score of the knowledge subscale was  $10.51 \pm 1.77$  out of 14, which indicates that participants have above average level of knowledge about patient confidentiality. Overall, as shown in table 3, from all sample, 66% have good level of knowledge, while 34% have poor knowledge about the patient confidentiality.

**Table 2**

*Knowledge about patient confidentiality among the students*

Item	Frequency	Percent	Scores' Mean $\pm$ SD
<b>1. Does confidentiality governed by law]</b>			
Don't know	72	17.9	<b>1.67 <math>\pm</math> 0.47</b>
No	62	15.4	
Yes	268	66.7	
<b>2. Does non-medical information considered confidential]</b>			
Don't know	63	15.7	<b>1.62 <math>\pm</math> 0.49</b>
No	91	22.6	
Yes	248	61.7	
<b>3. Do policies allow to access medical records freely</b>			
Don't know	75	18.7	<b>1.43 <math>\pm</math> 0.50</b>
No	171	42.5	
Yes	156	38.8	
<b>4. Can the third party access a result without patient consent]</b>			



Don't know	54	13.4	<b>1.56 ± 0.50</b>
No	224	55.7	
Yes	124	30.8	
<b>5. Can confidentiality be breached if a patient has died]</b>			
Don't know	77	19.2	<b>1.46 ± 0.50</b>
No	184	45.8	
Yes	141	35.1	
<b>6. Can patient confidentiality be breached if the disease contagious]</b>			
Don't know	64	15.9	<b>1.29 ± 0.45</b>
No	115	28.6	
Yes	223	55.5	
<b>7. Patient confidentiality can be breached if the disease is not contagious]</b>			
Don't know	63	15.7	<b>1.50 ± 0.50</b>
No	201	50.0	
Yes	138	34.3	
<b>Mean&amp; Std. Deviation</b>			
<b>10.51± 1.77 (Out of 14)</b>			

**Table 3**

*Students' distribution of level of knowledge about confidentiality*

	<b>Frequency</b>	<b>Percent</b>
<b>Good</b>	265	65.9
<b>Poor</b>	137	34.1
<b>Total</b>	402	100.0

Table 4 presents the participants' perceived attitudes toward maintaining confidentiality. Overall, for each question in the scale, the percentage of participants who were able to answer correctly was higher than those who failed to answer. The highest score was obtained for the question *"I allow non-medical personnel (eg, cleaning staff) to enter the examination room whilst I am providing care to patients"*, which was  $3.05 \pm 1.05$  out of 4, followed by *"I make and receive phone calls about patients' conditions when I am near other patients"* with a mean score of  $3.02 \pm 1.07$  out of 4. On the other hand, the lower scored item was *"I use virus protection and encryption software on the devices on which I store patient information"* which obtained a mean score of  $2.59 \pm 1.19$  out of 4. The mean score of the Attitude subscale was  $40.64 \pm 8.63$  (Out of 56), which is equivalent to 72.57% of 100. Overall, 53% of participants have positive attitude toward maintaining patient confidentiality, while 47% have negative attitude, as shown in table 5.





**Table 4**

*Perceived attitudes toward maintaining confidentiality among the students*

Item	Frequency	Percent	Scores' Mean $\pm$ SD
<b>[1. I make sure to take the information from the patient and document it completely confidentially]</b>			
Always	194	48.3	2.97 $\pm$ 1.19
Never	82	20.4	
Rarely	42	10.4	
Sometimes	84	20.9	
<b>[2. I discuss patients' conditions with them in front of other patients to save time and place]</b>			
Always	37	9.2	2.99 $\pm$ 1.03
Never	172	42.8	
Rarely	89	22.1	
Sometimes	104	25.9	
<b>[3. I allow non-medical personnel (eg, cleaning staff) to enter the examination room whilst I am providing care to patients]</b>			
Always	41	10.2	3.05 $\pm$ 1.05
Never	191	47.5	
Rarely	81	20.1	
Sometimes	89	22.1	
<b>[4. I use a universal serial bus (USB) to store patient information]</b>			
Always	45	11.2	2.99 $\pm$ 1.07
Never	181	45.0	
Rarely	80	19.9	
Sometimes	96	23.9	
<b>[5. I use a personal computer to store patient information]</b>			
Always	72	17.9	2.80 $\pm$ 1.14
Never	154	38.3	
Rarely	84	20.9	
Sometimes	92	22.9	
<b>[6. I send patient information online]</b>			
Always	53	13.2	2.89 $\pm$ 1.08
Never	159	39.6	
Rarely	92	22.9	
Sometimes	98	24.4	
<b>[7. I send information by phone]</b>			
Always	51	12.7	2.85 $\pm$ 1.05
Never	146	36.3	
Rarely	100	24.9	
Sometimes	105	26.1	
<b>[8. I deal with the information of patients with sensitive diseases (mental illnesses, sexual diseases, etc.) with more caution]</b>			
Always	172	42.8	2.84 $\pm$ 1.19
Never	85	21.1	
Rarely	65	16.2	
Sometimes	80	19.9	
<b>[9. I use virus protection and encryption software on the devices on which I store patient information]</b>			
Always	126	31.3	2.59 $\pm$ 1.19
Never	108	26.9	
Rarely	74	18.4	
Sometimes	94	23.4	
<b>[10. I discuss my patients' conditions with my colleagues during work breaks]</b>			
Always	43	10.7	2.72 $\pm$ 1.00
Never	117	29.1	



Rarely	98	24.4	
Sometimes	144	35.8	
<b>[11. I discuss my patients' conditions with my colleagues in open spaces, such as reception areas and corridors]</b>			
Always	44	10.9	2.97 ± 1.05
Never	171	42.5	
Rarely	90	22.4	
Sometimes	97	24.1	
<b>[12. I discuss my patients' conditions with my friends outside the workplace]</b>			
Always	35	8.7	2.97 ± 1.01
Never	166	41.3	
Rarely	94	23.4	
Sometimes	107	26.6	
<b>[13. I leave notes about my patients' conditions on my desk]</b>			
Always	40	10.0	3 ± 1.05
Never	180	44.8	
Rarely	83	20.6	
Sometimes	99	24.6	
<b>[14. I make and receive phone calls about patients' conditions when I am near other patients]</b>			
Always	44	10.9	3.02 ± 1.07
Never	189	47.0	
Rarely	78	19.4	
Sometimes	91	22.6	
<b>Mean &amp; Std. Deviation</b>			
<b>40.64± 8.63 (Out of 56)</b>			

**Table 5**

*Students' attitudes toward maintaining patient confidentiality*

	Frequency	Percent
Negative	189	47.0
Positive	213	53.0
Total	402	100.0

### 3.1 PREDICTORS OF STUDENTS' KNOWLEDGE AND ATTITUDES TOWARD PATIENT CONFIDENTIALITY

Tables 6 displays the results of correlations between the collected demographic variables and students' knowledge and attitudes toward patient confidentiality. The analysis showed that all demographic variables including age, gender, year of study, marital status, and specialty have no statistically significant correlations with students' knowledge and attitudes toward patient confidentiality. Only two variables showed weak level of correlations. University has weak positive correlation with students' level of knowledge ( $r=0.103$ ,  $P$ -value = 0.038); and with students' attitude toward patient confidentiality ( $r=0.193$ ,  $P$ -value= 0.00). Additionally, students' GPA has significant but weak negative correlation with students' attitude toward patient confidentiality ( $r=-0.100$ -,  $P$ -value= 0.045).

**Table 6***Predictors of students' knowledge and attitudes toward Patient Confidentiality*

		students' knowledge of Patient Confidentiality	students' attitudes toward Patient Confidentiality
<b>Age</b>	Pearson Correlation	0.019	0.046
	Sig. (2-tailed)	0.700	0.356
<b>The university entrance year</b>	Pearson Correlation	-0.077	-0.049
	Sig. (2-tailed)	0.126	0.325
<b>Data collector</b>	Pearson Correlation	-0.051	0.018
	Sig. (2-tailed)	0.309	0.721
<b>Specialty</b>	Pearson Correlation	0.005	-0.001
	Sig. (2-tailed)	0.913	0.984
<b>University</b>	Pearson Correlation	0.103*	.193**
	Sig. (2-tailed)	0.038	0.000
<b>Gender</b>	Pearson Correlation	0.032	0.087
	Sig. (2-tailed)	0.516	0.081
<b>GPA's for last academic year</b>	Pearson Correlation	-0.040	-.100*
	Sig. (2-tailed)	0.429	0.045
<b>Marital status</b>	Pearson Correlation	0.053	0.073
	Sig. (2-tailed)	0.288	0.144

#### 4 DISCUSSION

Healthcare professionals encounter many ethical dilemmas during their clinical practice. Preparing them when they are students with the appropriate ethical and legal principles is vital to build their knowledge and influence their attitudes toward maintaining patient's confidentiality, and to prevent any legal or ethical risks in their future practice<sup>5</sup>. This study was conducted to assess the level of knowledge and attitudes of health sector students in maintaining the confidentiality of patient information and patients' records. The study sample included males and females students from different health specialties from 17 colleges and universities in all regions in Saudi Arabia.

The study results revealed that approximately 66% of the participated students have good level of knowledge about the confidentiality of patients' information. This result is higher than the results from similar studies done in Ethiopia (59.8%)<sup>9</sup>, and in Iran (56.5%)<sup>13</sup>. Likewise, the mean score of knowledge domain was 10.51 out of 14 (SD=1.77), which was higher than the results by Karasneh et al., 2021<sup>16</sup> that surveyed physicians from public and private healthcare institutions in Jordan and reported a mean of 7.34 (SD=2.92). Students' attitudes toward maintaining patient confidentiality was positive for the majority of the students (53%), which raised the mean score of attitude scale to 40.64 out of 56 (SD= 8.63).

According to our results, receiving ethics courses during undergraduate study by 86% of the students could be a factor that contributed to raise participants' level of knowledge.



Furthermore, several factors can be considered as contributing factors that influenced participants' attitude such as attending training courses about medical ethics by 51% of the participants; having clinical experience of direct contact with patients by 82% of them; and having previous experience with ethical dilemmas which all are essential for enriching and shaping the attitude toward patient confidentiality.

The majority of participants were able to answer some of the knowledge questions correctly. For example, they agreed that patient confidentiality is governed by law, and they agreed that non-medical information considered confidential. However, two items were considered weak areas where participants were not confident in answering them correctly. These questions were about breaching confidentiality when the patient dies and when the disease is contagious which were answered correctly by only 46% and 29% respectively. This could be due to the limited clinical experience for students with these two patients categories. Instructors, and/or supervisors usually assign students to be exposed to active patients to maximize their benefits of interacting with patients, and do not assign them to dying patients. Additionally, for students' safety, supervisors are often trying to keep students away from infected cases especially during COVID-19 pandemic. These reasons might minimize students' exposure to such cases and affect their responses in these specific questions.

In our study, participants' perceived attitude toward maintaining patient confidentiality was generally positive as reflected by the positive responses of 53% of them. Although this percentage is considered good as compared to other studies<sup>9,16</sup>. There are some questions in the attitude scale that assess the frequency of breaching patient confidentiality by conducting specific actions were answered by "always", or "sometimes" by considerable percentage of participants. For instance, more than third of the participants answered the question about sending patient information online by either "always", or "sometimes". Similar proportion also applied to questions regarding discussing patients' conditions with colleagues during break; and discussing patients' conditions with friends outside the workplace. A vigilant assessment of responses is important to gain insight about the extent to which patient confidentiality might be breached by students. These findings mandate closer supervision and guidance to students when dealing with real patients.

The correlations between demographic characteristics and knowledge and attitude of health professionals were reported in some studies<sup>9,16</sup> but in our study, the analysis did not show significant correlations except for the university and the GPA, which are both weak correlations. The university is positively correlated with the level of knowledge and attitude. The correlations can be explained by the variety of universities in our sample that included 17



universities from all regions in Saudi Arabia. Universities offer different programs and courses to health professional students. In Saudi Arabia, universities do not offer unified programs even for the same specialties. Some universities focus on ethical and legal issues while others vary based on their curricula. The teaching methods also vary based on the programs' goals and content. Furthermore, the clinical training to students and their level of exposure to patients also vary based on the programs and the universities as well. All these variances among universities and how they deliver their programs may contribute to the correlations we found between universities and the level of knowledge and the attitude of their students. It is expected that the more clinical exposure to clinical cases and to ethical dilemmas, the more the student would understand and apply ethical principles among which is maintaining patient confidentiality.

Contrary to our expectations, another correlation in this study was, ( $r = -0.1$ ,  $p$ -value = 0.045) which indicates a weak negative correlation between the students' GPA of last academic year and the students' attitude toward patient confidentiality. Against what we expected, this correlation indicates that having high GPA actually does not correlate with practicing high level of maintaining patient confidentiality. However, this result might be statistically influenced by low variance among the GPAs because the majority of our sample (57%) have a high GPAs that range between 4 to 5.

The study results highlight the importance of assessing the level of knowledge and attitudes toward maintaining patient confidentiality. Although the general results are positive, health care professionals and educators need to pay more attention toward helping all health professions students gain the necessary knowledge and skills before they move to the work life to prevent any breach of patient confidentiality. This can be achieved by different strategies such as by adding more focus and time on teaching students the ethical principles as part of their undergraduate curricula either by designing a whole course about medical ethics, or at least having different lectures distributed in different courses/ blocks in the curricula. Another strategy is by revising the teaching methods they use in delivering the material and make evidence-based decision about the best method that serve better in delivering this content. Using Problem-based learning or team-based learning, clinical scenarios, simulation labs are all examples of alternatives that can be utilized in delivering medical ethics content and training<sup>17</sup>. Revising the clinical training plans is another approach that can help in ensuring that each student gets enough exposure to different cases and be able to maintain patient confidentiality. Delivering the content in theory and practice should be followed by in depth assessment of whether the students really gained the knowledge and became able to handle ethical dilemmas and able to maintain patient confidentiality. Part of students' assessment should include giving



a constructive feedback to students to encourage good practices and highlight the unethical practice that may harm the patients with or without intention, and to correct their future practice. Graduating qualified health professionals is pivotal goal for educational institutions that worth huge efforts from educators, program directors and hospital leaders to ensure having a safe and ethical practice in the future.

#### Limitations

Using a self-report questionnaire is a limitation for the current study.

## 5 CONCLUSION

Up to our knowledge, this study is the first in the country that assessed the level of knowledge and attitudes of healthcare professionals toward maintaining patient confidentiality that targeted almost all universities in all regions in Saudi Arabia. The study highlights the importance of assessing these variables to gain insight about the current level, Overall, the majority of participating students have good level of knowledge and positive attitudes toward maintaining patient confidentiality. However, based on the response, there are portions of students who breached the confidentiality of patients. Although this category of students is not large, paying more attention to students' ethical practice is vital to prevent patients' harm and to ensure safe and ethical practice from all healthcare professions students in Saudi Arabia. Some strategies were given to help educators and hospital leaders to build good knowledge and clinical training for students, which eventually can enhance the level of knowledge and build positive attitudes for all students. Future research should be done to investigate which educational strategies and clinical training is more successful in enhancing students' ethical knowledge and practice.

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