

Telepsychiatry: knowledge, effectiveness, and willingness; assessments of psychiatrists in Saudi Arabia

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ABSTRACT

الأهداف: تهدف هذه الدراسة إلى تقييم معرفة الأطباء النفسيين وإدراكهم فيما يتعلق بالطب النفسي عن بعد وتقييم مدى استعدادهم لتبني الممارسة السريرية للطب النفسي عن بعد في المملكة العربية السعودية.

المنهجية: أجريت هذه الدراسة الاستطلاعية بين الأطباء النفسيين العاملين في المملكة العربية السعودية خلال الفترة من نوفمبر 2020م حتى مايو 2021م. وذلك من خلال استبيان يتم تعبئته ذاتياً ويتضمن البيانات الاجتماعية والديموغرافية والعوامل المتعلقة بالمعرفة والإدراك والاستعداد والحوافز وفعالية الطب النفسي عن بعد. وقد تم توزيعها من خلال المنصات الإلكترونية. تم جدولة البيانات وتجهيزها في MS Excel، وتم إجراء جميع التحليلات الإحصائية باستخدام الإصدار 26 من SPSS.

النتائج: كانت العينة 328 طبيباً نفسياً مسجلين في المجموعة بمتوسط عمر 25-35 سنة (48.8%). تتألف المجموعة بشكل رئيسي من السعوديين (83.5%). فاق عدد المشاركين الذكور عدد الإناث 70.4% إلى 29.6%. بشكل عام، كان مستوى معرفة الطب النفسي عن بعد (الاتصالي) للأطباء النفسيين ضعيفاً (51.8%)، بينما (48.2%) من المستجيبين أظهروا معرفة جيدة. ومع ذلك، أظهر جميع المستجيبين تقريباً تصوراً جيداً (80.8%)، مع تصنيف 19.2% فقط على أنهم يفترقون للتصور الكافي. بالإضافة إلى ذلك، فإن الأفراد الأكبر سناً والاستشاريين والأطباء ذوي الخبرة من 11 إلى 15 عاماً والأطباء الذين يتفاعلون مع المرضى عبر البريد الإلكتروني وأولئك الذين تلقوا بشكل متكرر أسئلة المرضى المتعلقة بالاتصال عبر الإنترنت أشاروا إلى زيادة المعرفة.

الخلاصة: على الرغم من أن الإدراك كان إيجابياً فيما يتعلق بالطب النفسي الاتصالي، إلا أن معرفة الأطباء النفسيين بالموضوع كانت غير كافية. تعتمد معرفة الأطباء النفسيين على سنهم، وموقعهم، وسنوات خبرتهم، والتفاعل المتكرر مع المرضى من خلال المنصات الإلكترونية عبر الإنترنت، ومع العملاء الذين قدموا تفاصيل الاتصال الخاصة بهم عبر الإنترنت.

Objectives: To assess psychiatrists' knowledge and perception regarding telepsychiatry and evaluate their willingness to adopt telepsychiatry clinical practice in Saudi Arabia.

Methods: A cross-sectional study was conducted among psychiatrists working in Saudi Arabia from November 2020 through May 2021. A self-administered questionnaire comprising socio-demographic data, factors related to knowledge, perception, willingness, barriers, and the effectiveness of telepsychiatry, was distributed via online platform. Data were tabulated and cleaned in MS Excel, and all statistical analyses were performed using SPSS v26.

Results: There were 328 psychiatrists enrolled in the group with an average age of 25–35 years (48.8%). The group comprised mainly Saudis (83.5%); male participants outnumbered females (70.4% to 29.6%). Overall, the psychiatrists' telepsychiatry knowledge level was poor (51.8%), while (48.2%) of the respondents showed good knowledge. However, nearly all respondents exhibited good perception (80.8%), with only 19.2% classified as poor. In addition, older individuals, consultants, clinicians with 11–15 years of experience, clinicians interacting with patients via email, and those who frequently received patient questions regarding online communication indicated increased knowledge.

Conclusion: Although perception was positive regarding telepsychiatry, psychiatrists' knowledge on the subject was deemed insufficient. Psychiatrists' knowledge depended on their age, position, years of experience, frequent interaction with patients through an online platform, and clients that provided their online contact details.

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The earliest telemedicine trials were in the 1950s when Norfolk State Hospital and Nebraska Psychiatric Institute used closed-circuit television to provide patient consultations. Telemedicine has various branches; it includes telepsychiatry, which offers psychiatric care through any form of telecommunication, such as video conferencing.¹ Telecommunication provided for both psychiatrists and their patients a convenient, easy, and fast tool to connect both parties for accessible psychiatric evaluations, various forms of therapy such as individual, group, family therapy, medication management, and essential information on their diseases; most importantly it saved both time and effort for both psychiatrists and their patients.^{2,3} It can also be utilized for non-clinical applications, such as organizational learning, in addition to infinite services.⁴ Telepsychiatry can be applied in situations where patients stay in rural areas or move from distant areas become difficult; also, in follow-ups or medication refills.⁵ Many patients reported their satisfaction with telecommunications.³ Telepsychiatry, similar to any technology, faces barriers or limitations in its use; therefore, considerable research has been conducted to identify these barriers.²⁻¹³ Barriers such as technical, interpersonal challenges hindering their use of Telepsychiatry, lack of cost-effectiveness, the opposing view among psychiatrists; as many psychiatrists find it challenging to accept Telepsychiatry, and they are reluctant to accept the effectiveness of this service delivery and think that system workflow integration should be improved. In addition, psychiatrists dislike their inability to take physical steps to ensure patients' comfort.²⁻⁷

Furthermore, Telepsychiatry is the most active telemedicine application functioning as a feasible alternative for current mental health services, improved care services, and early treatment. Regardless of the benefits mentioned previously; psychiatrists are less satisfied with it because the quality of audio-visual technology impacts the reliability of teleconsultation. In addition, there were a few limitations when addressing satisfaction, such as the lack of return to clinics (RTCs), small sample sizes, and no apparent difference in satisfaction between Telepsychiatry and face-to-face consultation. For that reason, substantial research has been conducted to identify this satisfaction limitation as it is still unknown whether opposing is due to the program or technology. User acceptance or Patients and cultural factors presented a primary barrier or challenges in implementation, as many Saudi psychiatrists are skeptical of Telepsychiatry's outcomes, and clinicians are unsatisfied with the service, affecting their willingness to utilize telemedicine. The second barrier

is consumer acceptance, impacting patients' willingness to be treated by telemedicine. Other obstacles are the lack of qualified experts to implement the technology, essential Information and Communications Technology (ICT) infrastructure, and acceptable strategies and plans for implementing telemedicine in Saudi Arabia. In addition, some health providers lack ICT skills and cannot apply the innovation.⁶⁻¹³ Thus, there are scattered current data investigating psychiatrists' satisfaction with Telepsychiatry in Saudi Arabia. Therefore, this study aims to fill the research gap in this area.

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Table 1 - The psychiatrists' socio-demographic characteristics. n=328

Study data	n (%)
<i>Age group</i>	
25–35 years	160 (48.8)
36–45 years	95 (29.0)
46–55 years	49 (14.9)
56–65 years	19 (05.8)
>65 years	05 (01.5)
<i>Gender</i>	
Male	231 (70.4)
Female	97 (29.6)
<i>Nationality</i>	
Saudi	274 (83.5)
Non-Saudi	54 (16.5)
<i>Position</i>	
Resident	140 (42.7)
Specialist	79 (23.8)
Consultant	110 (33.5)
<i>Years of experience in psychiatry</i>	
1–5 years	129 (39.3)
6–10 years	66 (20.1)
11–15 years	57 (17.4)
16–20 years	39 (11.9)
>20 years	37 (11.3)

Methods. Materials and methods. Study settings, participants, and sampling. This is a cross-sectional study conducted among psychiatrist working in Saudi Arabia. A self-administered questionnaire was distributed among psychiatrists using online platform (WhatsApp, emails, social media). The questionnaire was composed of socio demographic data, factors related to knowledge, perception, willingness, barriers and effectiveness of telepsychiatry. It was conducted in Saudi Arabia from November 2020 through May 2021. Psychiatrists working in Saudi Arabia were randomly selected and asked to take part in an online-based survey. The number of psychiatrists in Saudi Arabia are 1259 was used for sample size calculation, and the values were placed in the level of precision formula that yielded a sample size of 295. To increase the validity of the results, the sample size was increased to 328. All participants received an online web page explaining the study purpose and were requested to provide informed consent before the online questionnaire proceeded.

Table 2 - Factors related to telepsychiatry knowledge. (n=328)

Statements	Low	Average	High
	n (%)	n (%)	n (%)
Are you familiar with telepsychiatry technology?	98 (29.9)	171 (52.1)	59 (18.0)
Are you familiar with the medical applications of telepsychiatry technology?	121 (36.9)	156 (47.6)	51 (15.5)
How often are conferences, speeches, or meetings held in your workplace regarding telepsychiatry technology?	180 (54.9)	109 (33.2)	39 (11.9)
Are you familiar with telepsychiatry tools?	131 (39.9)	145 (44.2)	52 (15.9)
Are you familiar with telepsychiatry guidelines?	177 (54.0)	109 (33.2)	42 (12.8)
Are you familiar with the use of telepsychiatry in other countries?	163 (49.7)	137 (41.8)	28 (08.5)
Is continuous training in the use of telepsychiatry necessary for doctors?	62 (18.9)	157 (47.9)	109 (33.2)
Total score (mean±SD)	12.3±3.45	--	--
<i>Level of knowledge</i>			
Poor (≤12 score)	170 (51.8)	--	--
Good (>12 score)	158 (48.2)	--	--

The assessment of psychiatrists' knowledge toward telepsychiatry is described in Table 2.

Table 3 - Factors related to the perception of telepsychiatry. (n=328)

Statements	Disagree	Agree
	n (%)	n (%)
Telepsychiatry is a viable approach for providing medical care services to patients	46 (14.0)	282 (86.0)
There is a potential role for information and communication technology (ICT) in healthcare	42 (12.8)	286 (87.2)
Using telepsychiatry systems can save time and money	32 (9.8)	296 (90.2)
Telepsychiatry systems can save effort	36 (11.0)	292 (89.0)
The application of ICT in healthcare is already available	121 (36.9)	207 (63.1)
Total Score (mean±SD)	4.15±1.17	--
Level of perception		
Poor (≤3 score)	63 (19.2)	--
Good (>3 score)	265 (80.8)	--

The factors related to perception toward telepsychiatry are shown in Table 3

Table 4 - Factors related to willingness towards telepsychiatry. (n=328)

Statements	Disagree	Agree
	n (%)	n (%)
I want to consult with large centers in my specialty from my hospital	39 (11.9)	289 (88.1)
The implementation of telepsychiatry technology is appropriate to the current conditions in hospitals	36 (11.0)	292 (89.0)
I think that my colleagues would be willing to implement telepsychiatry technology	47 (14.3)	281 (85.7)
Telepsychiatry systems can be integrated into existing systems	50 (15.2)	278 (84.8)

Table 4 describes the factors related to willingness towards telepsychiatry. It reveals that the majority of psychiatrists were willing to learn and implement telepsychiatry at their current workplace

Prevention of responses repetition was made through the linking of every survey response with an internet protocol. The Medical College Institutional Review Board, Imam Mohammad Ibn Saud Islamic University, Riyadh, Saudi Arabia, approved this study protocol.

Inclusion and exclusion criteria. Psychiatrists in Saudi Arabia of either gender residents, specialists, consultants were included in the study. Psychiatrists working outside Saudi Arabia, other medical specialties, and psychologists were excluded from this study.

Data collection tools. A self-administered questionnaire was used to collect data, which are outlined below. Comprising socio-demographic data, factors related to knowledge, perception, willingness, barriers, and the effectiveness of telepsychiatry. Three Psychiatry consultants evaluated the questions, and a pilot study was conducted to ensure that questions were straightforward and understandable.

Statistical analysis. Data were presented as numbers, percentages, mean, standard deviation, and median (min-max). Knowledge of telepsychiatry was assessed using seven questions (Table 3) with “low” as 1, “average” as 2, and “high” as 3 in the answer options. The total score for knowledge was obtained by adding the seven questions, and a possible score range of 3–21 was generated, indicating higher scores as more knowledge

of telepsychiatry. The mean score determined the level of knowledge; poor knowledge was classified in the range of 3–12 points, and more than 12 points indicated good knowledge. The participants’ perception was assessed by five questions (Table 4) where “disagree” was 0, and “agree” was 1 in the answer options. The total perception score was obtained by adding the five questions and generating the score range 0–5, indicating that higher scores showed a high perception of telepsychiatry. The mean score was used to determine the perception level; respondents with three points or less were classified with poor knowledge, and those with above three points were considered to have a good perception of telepsychiatry.

The knowledge and perception scores were compared with socio-demographic characteristics, computer access, and literacy factors using the Mann–Whitney Z-test and Kruskal–Wallis H-test. A *p*-value of <0.05 (two-sided) was used to indicate statistical significance. In addition, normality tests were performed using the Kolmogorov–Smirnov test and the Shapiro–Wilk test. Knowledge and perception scores were abnormally distributed; thus, non-parametric tests were applied. All data analyses were performed using a statistical package for social sciences, version 26 (SPSS, Armonk, NY: IBM Corp.).

Table 5 - Statistical difference between the knowledge and perception scores regarding the psychiatrists' socio-demographic characteristics. (n=103).

Factors	Knowledge score (21) Mean±SD	H/Z test P-value	Perception score (5) Mean±SD	H/Z test P-value
<i>Age group^a</i>				
25–35 years	11.4±3.11	Z=-4.236	3.91±1.31	Z=-3.349
>35 years	13.1±3.57	<i>p</i> <0.001**	4.39± 0.92	<i>p</i> =0.001 **
<i>Gender^b</i>				
Male	12.5±3.41	Z=-1.621	4.27±1.01	Z=-1.897
Female	11.9±3.53	<i>p</i> =0.105	3.89±1.39	<i>p</i> =0.058
<i>Nationality^b</i>				
Saudi	12.4±3.52	Z=-0.252	4.19±1.11	Z=-0.840
Non-Saudi	12.1±3.14	<i>p</i> =0.801	3.98±1.32	<i>p</i> =0.401
<i>Position^c</i>				
Resident	11.4±3.24	H=23.198	4.09±1.17	H=3.050
Specialist	12.2±2.73		3.99±1.38	
Consultant	13.6±3.78	<i>p</i> <0.001**	4.36±0.91	<i>p</i> =0.218
<i>Years of clinical experience^a</i>				
1–5 years	11.2±2.93		4.08±1.15	
6–10 years	12.5±3.23	H=22.609	3.89±1.42	H=7.035
11–15 years	13.4±3.69	<i>p</i> <0.001**	4.23±1.18	<i>p</i> =0.071
>15 years	13.2±3.77		4.46±0.76	
<i>How often do you interact with patients via emails or social media in your role as a doctor?^a</i>				
Never	10.0±2.88	H=36.378	3.88± 1.19	H=8.066
Sometimes/Rarely	12.8±3.22		4.17±1.11	
Often/Always	12.8±3.62	<i>p</i> <0.001 **	4.28±1.18	<i>p</i> =0.018 **
<i>Number of smart devices^a</i>				
One	11.9±3.66		4.08±1.22	
Two	12.4±3.45	H=6.349	4.07±1.14	H=4.799
Three	12.9±3.17	<i>p</i> =0.096	4.41±0.89	<i>p</i> =0.187
More than three	11.9±3.44		4.09±1.39	
<i>Have patients asked about online methods to contact you?^b</i>				
Yes	12.7±3.51	Z=-3.712	4.19±1.15	Z=-1.639
No	11.1±2.95	<i>p</i> <0.001**	4.04±1.14	<i>p</i> =0.101
<i>Are you concerned regarding possible legal issues when interacting with patients online?^b</i>				
Yes	12.4±3.41	Z=638.37	4.14±1.14	Z=1.109
No	12.1±3.67	<i>p</i> =0.565	4.24±1.20	<i>p</i> =0.268

^a*p*-value was calculated using the Kruskal–Wallis H-test, ^b*p*-value was calculated using the Mann

Results. When measuring the difference in the knowledge and perception scores regarding the psychiatrists' socio-demographic and computer literacy, the older (>35 years) age group's mean knowledge score ($Z=-4.23$; $p<0.001$) and perception score ($Z=-3.349$; $p=0.001$) were significantly higher. In addition, we observed that psychiatric consultants demonstrated significantly better knowledge scores ($H=23.198$; $p<0.001$) but not perception. Furthermore, respondents with 11–15 years' experience exhibited significantly higher knowledge scores ($H=22.609$;

$p<0.001$), and psychiatrists that the patients questioned about online means of communication also showed significantly higher knowledge scores ($Z=-3.712$; $p<0.001$). However, psychiatrists who had never interacted with patients via email or social media demonstrated significantly low knowledge scores ($H=36.378$; $p<0.001$) and perception scores ($H=8.066$; $p=0.018$) (Table 5).

Discussion. The rationale of the present study was to evaluate psychiatrists' knowledge and perception regarding telepsychiatry and determine their willingness

and effectiveness in its use. In this study, psychiatrists' knowledge of telepsychiatry was insufficient. More than half (51.8%) of psychiatrists constituted a poor level of knowledge, while 48.2% had a good level, with a mean score of 11.6; SD 3.51 of 21 points. Several papers have reported a low level of knowledge in online health consultations. For example, Albarrak et al¹⁴ (2021) reported that the majority of physicians have a low level of knowledge of telemedicine technology. Likewise, Ayatollahi et al¹⁵ (2021) indicated that clinicians' knowledge about telemedicine was limited, consistent with our report.

Furthermore, in Poland, reports indicated that only 15% of respondents demonstrated a broad telepsychiatry knowledge, while 10% could not define telepsychiatry.¹⁶ However, Zayapragassarazan (2016) reported that the knowledge of healthcare professionals in a teaching hospital in the Puducherry Region of India was adequate.¹⁷ Approximately 80% reported a fair to a good level of knowledge, and only 24% exhibited inadequate knowledge of telemedicine, higher than the knowledge level of psychiatrists in our study. We identified that the factors attributed to an increased telepsychiatry knowledge level are older clinicians, consultants, those with 11–15 years of experience in psychiatry, those who often use emails and social media, and those whom the patients frequently ask to contact them through online platforms. This study is the first paper in Saudi Arabia to evaluate the predictors of knowledge and could be a significant supplemental finding of the study's discipline.

Moreover, in assessing specific knowledge of telemedicine, we noted that the respondents' familiarity with telepsychiatry technology was moderate (44.6%), higher than in the paper of Zayapragassarazan (2016),¹⁷ but lower than that of Shittu et al. (2021).¹⁸ Conversely, psychiatrists demonstrated inadequate information regarding the medical application of telepsychiatry technology. Therefore, since many were not experts in the method and guidelines, conferences, speeches, or meetings in the workplace using telepsychiatry were limited. However, many psychiatrists are interested in continuous training regarding telepsychiatry, believing it is necessary for them as doctors.

Perception of telepsychiatry was another indicator in this study. Our investigation noted that based on 5 statements of perception, the overall mean score was 4.15 (SD 1.17), with most classified as having a good level of perception (80.8%) and only 19.2% inadequate. This result is consistent with the paper of Albarrak et al., who documented that approximately 90% of physicians demonstrated a high perception

of telemedicine.¹⁴ However, in Iran,¹⁵ the clinicians showed a moderate telemedicine perception level, lower than in our report. In Poland,¹⁶ a significant proportion of physicians demonstrated positive aspects of this method of medical care. However, nearly two-thirds (63%) would not want telepsychiatry to be generally implemented in their current practice. In the United States,¹⁹ patients and health providers were satisfied with their telepsychiatry services, although providers were more likely to show concerns about the potential side effects of telepsychiatry on therapeutic understanding. We conclude that an increase in perception might be predicted in an older age group, while a decrease would likely be seen among those who do not interact with patients through email or social media.

In further investigating the factors contributing to telepsychiatry perception, we noticed that most psychiatrists demonstrated high perception in 4 out of 5 statements (varying from 86% to 90.2%), including: "Using telepsychiatry systems can save time and money"; "Telepsychiatry systems can save effort"; "There is a potential role for information and communication technology (ICT) in healthcare"; and "Telepsychiatry is a viable approach for providing medical services to patients." The psychiatrists only exhibited a moderate level in the statement "the availability of ICT in healthcare." These results are consistent with a paper conducted in Riyadh, Saudi Arabia.¹⁴ The authors stated that almost all (93.3%) of physicians agreed that telemedicine can save time and money, that it is a feasible approach for delivering healthcare services to patients (93.2%), and can save effort (88.6%). Another paper reported in India¹⁷ showed a better perception of the online medical services method, documenting that most health professionals working in a teaching hospital expressed that telehealth would enhance patients' direct access to medicine, especially in emergency and chronic medical illnesses. Similarly, Kissi et al²⁰ (2020) indicated that telemedicine services' viewpoints and perceived usefulness were found to influence physicians' behaviors. They explained that this reaction results from increased efficiency, superior services, quality of patient care delivery, and satisfaction among physicians in using telehealth services, and concluded that the acceptance of telemedicine services in healthcare settings depends on physicians' and patients' satisfaction with the service's utilization.

In addition, the willingness of physicians to use telepsychiatry was examined in this study. Based on our investigation, most respondents demonstrated their willingness to launch telepsychiatry technology at their current workplace (89%), believing that their

colleagues would be willing to implement this method (85.7%). Furthermore, they believed that telepsychiatry could be integrated into the current medical care system (84.8%) and may have the necessary tools to conduct online consultations in large centers related to their specialty (88.1%). In a study by Shittu et al¹⁸ (2021), the authors stated that the willingness of healthcare workers towards telemedicine depends on their current knowledge regarding telehealth applications, the perception of telehealth benefits, and reduced barriers to telehealthcare, in line with our report.¹⁸

The barriers that might influence psychiatrists not to adapt to telepsychiatry were also discussed in this study. Based on our accounts, the primary barrier affecting the decision to accept telepsychiatry was the concern of patients' privacy and confidentiality (64%), followed by the lack of consultation between information technology experts and clinicians (49.1%), and lack of suitable training in the use of equipment (48.8%), consistent with the papers of Albarrak et al. (2021),¹⁴ Ayatollah et al. (2021),¹⁵ and Wojtuszek et al. (2016).¹⁶

Finally, more than half of the respondents believe that telepsychiatry effectively treats and assesses patients with psychiatric illness (52.1%, and 56.4%, respectively). Study future implications, online method is important for the continuous delivery of medical care services among patients requiring therapy.

Conclusion. Although there was a positive perception regarding telepsychiatry, psychiatrists perceived knowledge about it was deemed insufficient. Psychiatrists' increased knowledge depends on their age, position, years of experience in psychiatry, frequent interaction with patients through an online platform, and clients often asking how to reach them online. Willingness to adapt to telepsychiatry depends on the hospital's situation, eagerness to learn more about online consultation psychiatry in a large hospital, and listening to colleagues' views regarding new methods they believe are effective in treating and examining psychiatric patients. Patients' privacy and confidentiality are the negative factors in adopting these changes. Thus, hospital management should take initiatives to address this issue. Given this, it is important to address the gaps in psychiatrists' knowledge. Poor knowledge is attributed to their lack of familiarity with telepsychiatry technology and its guidelines. Thus, continuous training of physicians is important to achieve better knowledge, the necessary tool in implementing telepsychiatry as a medical service in our region.

Limitation. As any cross-sectional, self-administered questionnaire limitations are subject to recall bias and

probability of misinterpretations cannot be ruled out, which may influence the results of the study. Moreover, the survey was done on psychiatrists working exclusively in Saudi Arabia, therefore, the generalizability of the result to other countries is limited. The questionnaire was there is no well-established, standardized questionnaire up to our knowledge.

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Statistics

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Describe statistical methods with enough detail to enable a knowledgeable reader with access to the original data to verify the reported results. When possible, quantify findings and present them with appropriate indicators of measurement error or uncertainty (such as confidence intervals). Avoid relying solely on statistical hypothesis testing, such as the use of *P* values, which fails to convey important information about effect size. References for the design of the study and statistical methods should be to standard works when possible (with pages stated). Define statistical terms, abbreviations, and most symbols. Specify the computer software used.