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Assessing Mental Illness Referral Request Acceptance: A Nationwide E-Referral Data From Saudi Arabia

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Background and Objective: Mental disorders significantly impact quality of life and life expectancy, representing a leading cause of global disease burden. Healthcare systems worldwide face challenges in meeting mental health service demands, particularly due to specialist shortages and geographical barriers. Saudi Arabia has implemented an innovative nationwide electronic referral system (SMARC) as part of its digital health transformation strategy to enhance mental healthcare accessibility. This study examined SMARC's effectiveness in facilitating mental health service access by analyzing patient transfer acceptance rates between healthcare facilities and identifying factors influencing these rates.

Methods: This retrospective cross-sectional study analyzed 9722 mental health electronic referrals within SMARC from January 2020 to December 2021. Descriptive statistics characterized referral patterns, while bivariate and multivariable logistic regression analyses identified factors associated with referral acceptance, calculating adjusted odds ratios (aORs) and 95% confidence intervals.

Results: The system achieved an overall acceptance rate of 82.5%, with different patterns across age groups and regions. Lower acceptance rates were observed for ages 15–25 years (aOR = 0.84; 95% CI = 0.70–0.99) and 46–65 years (aOR = 0.83; 95% CI = 0.70–0.99) compared to ages 26–35 years. Life-saving referrals showed the highest acceptance (aOR = 2.60; 95% CI = 1.51–4.48), while psychiatrist availability significantly influenced acceptance rates (aOR = 1.36; 95% CI = 1.17–1.58). External referrals were half as likely to be accepted as internal ones (aOR = 0.51; 95% CI = 0.42–0.64).

Conclusion: SMARC demonstrates effectiveness in optimizing mental healthcare access through strategic matching of patient needs with available resources. The system's selective acceptance patterns reflect its capability to prioritize care based on clinical urgency and resource availability. These findings provide valuable insights for policymakers to keep enhancing digital health infrastructure and mental healthcare delivery. The SMARC model offers a promising framework for implementing similar digital referral systems globally to improve mental healthcare coordination and accessibility.

Keywords: mental health, psychiatry, referral systems, acceptance rates, health policy, Saudi Arabia, regional variation, Saudi Medical Referral Center

Introduction

Providing the required health care for people with mental disorders is a growing public health concern.[1] The World Health Organization (WHO) has highlighted the high prevalence of mental disorders globally, with one in every eight

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people living with mental disorder.[2] This high prevalence marks mental disorders as a leading cause of the global disease burden and disability worldwide.[3] Its incidence is expected to continue rising, increasing the disease burden in the coming years.[3] Both quality of life and life expectancy are diminished by mental disorders, which require rigorous prevention and treatment plans.[4] However, global healthcare systems are under-resourced to meet the high demand for mental health needs, creating a significant gap between the demand and provision of care.[2]

Healthcare system in Saudi Arabia is undergoing a significant transformation to enhance service quality and improve accessibility as part of Saudi Vision 2030.[5] The Ministry of Health (MoH), the primary healthcare provider, has introduced a new patient-centered Model of Care (MoC) to enhance social, mental, and physical health of individuals.[5] This new MoC ensures patients receive care tailored to their health needs. The MoC is organized into six systems: Keep Me Well, Chronic Care, Urgent Care, Planned Care, Safe Birth, and Last Phase, with mental healthcare integrated within the Chronic Care system aiming to address mental healthcare gaps.

Access to mental healthcare services in Saudi Arabia is provided by the MoH through 21 specialized mental health hospitals, with a total capacity of 4046 beds, in addition to 99 psychiatric clinics distributed across the regions of the country.[6] Additional mental health services are also available through other governmental and private hospitals.[7] Also, within the primary healthcare centers, Primary Psychological Clinics, which are known as Comprehensive Guidance Clinics, are easily accessible to the public.[6]

To further enhance quality and accessibility of care, including mental health, digital health services have been adopted in Saudi Arabia. The MoH offers a 24/7 telephone consultation service, enabling individuals to seek immediate medical advice,[6] supplementing the services of the Psychological Consultation Center under the National Committee for Mental Health Promotion.[8] This center offers psychological consultations by trained and experienced mental health professionals via a call-in service. Other digital platforms include the Sehhaty platform, which provides users with access to virtual clinics,[9] and the Qareboon App, which provides mental text counseling by specialized professionals.[10]

However, most people with mental disorders around the globe have limited and delayed access to the required healthcare services.[2,11] Several factors play a role in the lack of access, including a shortage of specialized mental health professionals, geographical barriers where patients reside at a distance from specialized mental health complexes, and deficiencies in mental healthcare systems.[12,13] Saudi Arabia has recognized these challenges and initiated efforts to improve access through novel solutions.[14] Implementing an electronic referral (e-referral) system represents one promising approach to enhance connectivity between facilities, promote communication and coordination, and improve decision-making. This integrated system is designed to connect various healthcare facilities via a unified platform.[15,16] Together, these effects of the e-referral integrated system can increase access and reduce waiting times for those requiring mental health care.[17,18] Recognizing these potential benefits, several countries have adopted e-referral systems, and Saudi Arabia has begun implementing this technology as well.[19–21]

Building on this knowledge, Saudi Arabia has implemented a nation-wide e-referral system known as the Saudi Medical Appointments and Referrals Centre (SMARC).[16] This system links all MoH and governmental hospitals, and the majority of private hospitals across the 13 Saudi administrative areas into one platform to coordinate patients' referrals. Mental illness referrals are one of the referrals requested in SMARC. This system offers three types of referrals according to patients' medical conditions, which are life-saving, emergency, and routine referrals.[22] These categories provide details of the severity of patients' conditions, which facilitate decision-making and prioritization of care to those in most need.[22]

This system provides an opportunity to comprehensively explore the balance between mental illness demand and supply at a national level, by exploring the number of patients who successfully were accepted to be transferred from one hospital to another (known as referral acceptance rate) where the required healthcare resources are available. Understanding the scale of demand and supply of mental health care can guide effective healthcare resource allocation and inform developing strategies for prevention and treatment programs, to subsequently reduce the disease burden.[23] This will also highlight areas for improvement in the referral process to better coordinate patients' referrals and allow timely access to the required care.

Therefore, this study aimed to explore the acceptance rate of mental illness referral requests in Saudi Arabia and identify predictors associated with the acceptance rate. This innovative study is the first to analyze the acceptance patterns of mental e-referrals at a national level in Saudi Arabia. It explores SMARC e-referral data of mental referral acceptance, providing valuable insights into care accessibility and factors influencing it. Also, the current literature of

e-referral systems examined the referrals initiated from primary healthcare centers,[24–26] unlike SMARC e-referral system, which coordinates referrals between secondary, tertiary, and specialized care. The findings provide new perspectives of e-referral systems that can enrich the existing literature.

We hypothesize that specific patient and referral-related factors are significantly associated with mental health e-referral acceptance rates across Saudi Arabian healthcare facilities.

Materials and Methods

Study Design and Setting

This retrospective cross-sectional study analyzed data from SMARC system covering the period from January 2020 to December 2021. The SMARC system, which manages all e-referrals across Saudi Arabia, stands out from traditional referral systems by mainly supporting the exchange between secondary and tertiary facilities and specialized healthcare providers. All MoH and governmental hospitals and the majority of private hospitals have access to this system to request a referral.

To initiate a referral request, the treating physician first identifies the need for additional medical resources, then upload the referral request to the SMARC e-referral system, with the assistance of the office of coordination and eligibility for treatment, which is available in each hospital with direct access to the e-referral platform. The request is uploaded, based on the patient's medical condition, as either emergency or routine with up to three suggested hospitals offering the requested resources. The e-referral system can also suggest hospitals, as an assistant tool, to streamline the referral process. Emergency referrals need to be accepted by the chosen hospitals within 72 hours, while routine referrals have up to 14-day acceptance window. If the request is rejected within this period, the e-referral system automatically forwards it to additional hospitals. If no hospital has accepted the request once the specified timeframe elapses, it is escalated to SMARC medical referral management team to secure acceptance from a wider pool of governmental and private hospitals, both within the same region of the original hospital or in other regions. Meanwhile, patients continue receiving necessary healthcare at the original hospital.

For life-saving referrals, SMARC provides a 24/7 hotline for treating physicians to call and request immediate acceptance. These calls are directed to on-call specialized consultants for review and decision-making. Once a life-saving referral is accepted, the treating physicians will receive the name of the receiving hospital, then upload the accepted request to the e-referral system for monitoring and data storage.

This study electronically extracted all mental referral requests stored in the SMARC e-referral system, using the digital features of this system. The SMARC e-referral system covers nationwide data from the 13 Saudi administrative areas. The 13 administrative areas are pooled, under the new healthcare transformation, into five Business Units (BUs) as the following: Riyadh and Alqassim in the Central BU; Eastern administrative area in the Eastern BU; Makkah, Medina, and Albaha in the Western BU; Hail, Aljouf, Northern Border and Tabuk in the Northern BU, and Asir, Jazan, and Najran in the Southern BU.[27]

Ethical Consideration

The Institutional Review Board (IRB) of the Ministry of Health approved this study (Ref: 23–77-E), and all procedures were designed to guarantee anonymity and ensure the confidentiality of the data collected.

Study Measurements

The primary outcome was mental health e-referral acceptance status, coded as a binary variable: 0 = referral not accepted and 1 = referral accepted. Potential predictors included sociodemographic characteristics of the patients such as age, sex, and nationality; season of the year, BUs, and year of referral. The characteristics of the psychiatric electronic referral requests included the type of referral, which was categorized as life-saving, routine outpatient department (OPD), routine inpatient, and emergency. Life-saving referral refers to a mental illness that requires urgent intervention to save mortality/morbidity, while emergency referral represents a less urgent mental illness where medical intervention can wait a couple of days. The characteristics of the referrals also included the reason for the referral (such as the lack of available specialty, physician, equipment, or bed). This study also examined the pathways of referrals as internal and external referrals. Internal referral is defined as transferring a patient from one healthcare facility to another within the same

administrative area, while external referral refers to transferring a patient between two healthcare facilities located in two different administrative areas.

Statistical Analysis

Descriptive statistics including mean ± standard deviation for continuous variables and frequencies for categorical variables were used to summarize the data. Bivariate associations between e-referral acceptance status and referral characteristics were examined using chi-square tests for categorical variables and *t*-tests for continuous variables.

To assess factors associated with e-referral acceptance while controlling for confounders, a multivariate binary logistic regression model was constructed using the following equation:

$$\text{logit}(\text{P}(\text{Acceptance} = 1)) = \beta_0 + \beta_1(\text{Age\_categories}) + \beta_2(\text{Sex}) + \beta_3(\text{Nationality}) + \beta_4(\text{Year}) + \beta_5(\text{Season}) + \beta_6(\text{Business\_units}) + \beta_7(\text{Type\_of\_referral}) + \beta_8(\text{Reason\_for\_referral}) + \beta_9(\text{Referral\_Direction}) + \varepsilon$$

Where acceptance is the binary outcome variable (0=rejected, 1=accepted); β0 is the intercept; β1-9 are the regression coefficients for the predictor variables (Age_categories, Sex, Nationality, Year, Season, Business_units, Type_of_referral, Reason_for_referral, Referral_Direction); and ε is the error term.

The logistic regression analysis estimated the adjusted odds ratios and 95% confidence intervals for each predictor on e-referral acceptance while controlling for the influence of other variables in the model. Statistical significance was assessed at the P <0.05 level. All statistical analyses were conducted using STATA version 16 (StataCorp, 2020. StataCorp LLC, College Station, TX).

Results

Sociodemographic Characteristics

Table 1 presents the demographic characteristics of 9722 participants who were diagnosed with mental health conditions, with an overall referral acceptance rate of 82.5%. Most referrals were for Saudi nationals (87.03%), men (64.12%), and patients aged 26–35 (23.58%). Referrals increased in 2021 to account for 58.24% of the total referrals over the study period. The seasonal distribution was steady, although autumn showed a slight increase at 28.11%. Most referrals occurred in the western region (45.11%), and across all regions, the majority of referrals were internal (91.70%). Patients accepted for referrals were significantly different from those rejected (p-value <0.005) in two categories: age and BUs.

Table 1 Sociodemographic Characteristics of Patients According to e-Referral Status Between 2020 and 2021 Across Saudi Arabia

Characteristics	Total N (%) 9722(100)	Rejected N (%) 1701 (17.50)	Accepted N (%) 8021(82.50)	P-value
Age (Years)				< 0.01**
< 6	405 (4.17)	71(17.53)	334(82.47)	
7–14	573 (5.89)	101(17.63)	472(82.37)	
15–25	1777 (18.28)	334(18.80)	1443(81.20)	
26–35	2292(23.58)	385(16.80)	1907(83.20)	
36–45	2101(21.61)	393(18.71)	1708(81.29)	
46–65	1807(18.59)	319(17.65)	1488(82.35)	
>65	767(7.89)	98(12.78)	669(87.22)	

(*Continued*)

Table 1 (Continued).

Characteristics	Total N (%) 9722(100)	Rejected N (%) 1701 (17.50)	Accepted N (%) 8021(82.50)	P-value
Sex				0.491
Males	5491 (64.12)	956(17.41)	4535(82.59)	
Females	3072 (35.88)	553(18.00)	2519(82.00)	
Nationality				0.2220
Non-Saudi	1261(12.97)	236(18.72)	1025(81.28)	
Saudi	8461(87.03)	1465(17.31)	6996(82.69)	
Year				0.226
2020	4060(41.76)	688(16.95)	3372(83.05)	
2021	5662(58.24)	1013(17.89)	4649(82.11)	
Seasons				0.1449
Winter	2677(27.54)	463(17.30)	2214(82.70)	
Spring	2228(22.92)	423(18.99)	1805(81.01)	
Summer	2084(21.44)	341(16.36)	1743(83.64)	
Autumn	2733 (28.11)	474(17.34)	2259(82.66)	
Business Units				< 0.001***
Central	1100(11.31)	304(27.64)	796(72.36)	
Eastern	1178(12.12)	181(15.37)	997(84.63)	
Western	4386(45.11)	787(17.94)	3599(82.06)	
Northern	1548(15.92)	118(7.62)	1430(92.38)	
Southern	1510(15.53)	311(20.60)	1199(79.40)	
External vs Internal				0.0553
Internal	8915(91.70)	1540(17.27)	7375(82.73)	
External	807 (8.30)	161(19.95)	646(80.05)	

Notes: Results were presented as frequency [number (N) and percent (%)]. **Significant difference at $p < 0.01$ and ***significant difference at $p < 0.001$.

However, the acceptance was relatively even across age and BU groups, with the highest acceptance noted among individuals over 65 years and from Northern BU.

Referral Characteristics According to Referral Acceptance Status

As detailed in Table 2, the descriptive analysis of e-referral requests shows specific trends in referral types and reasons. Life-saving referrals were accepted at the rate of 100%, followed by routine admission at 82.87%, while emergency referrals were the lowest at 78.06%. The predominant reasons for referral acceptance were unavailable physician and subspeciality, with acceptance rate of 86.81% and 82.04%, respectively. Unavailable bed was the least reason for referral acceptance at 69.96%. All patterns and differences were statistically significant (p-value < 0.001).

Table 2 E-Referral Characteristics According to the Status of E-Referral Requests Between 2020 and 2021 Across Saudi Arabia

Referral characteristics	Total N (%) 9722(100)	Rejected N (%) 1701 (17.50)	Accepted N (%) 8021(82.50)	P-value
Referral Types				< 0.001***
Life-saving	184(1.89)	0(0.00)	184(100.00)	
Routine OPD	2820(29.01)	483(17.13)	2337(82.87)	
Routine admission	2976(30.61)	377(12.67)	2599(87.33)	
Emergency	3842(38.49)	821(21.94)	2921(78.06)	
Reason For Referral				< 0.001***
Unavailable subspecialty	6680(68.71)	1200(17.96)	5480(82.04)	
Unavailable physician	2274(23.39)	300(13.19)	1974(86.81)	
Unavailable machine	302(3.11)	61(20.20)	241(79.80)	
Unavailable Bed	466(4.79)	140(30.04)	326(69.96)	

Notes: Results were presented as frequency [number (N) and percent (%)]. ***significant difference at $p < 0.001$.

Table 3 Multivariable Logistic Regression Analysis of Predictors for Referral Acceptance Between 2020 and 2021 Across Saudi Arabia

Predictors	Adjusted OR	P-value	95% CI
Age			
> 6	0.77	0.11	0.57–1.06
7–14	0.78	0.08	0.59–1.03
15–25	0.84	< 0.05*	0.70–0.99
26–35	*Ref*		
36–45	0.87	0.10	0.73–1.03
46–65	0.83	0.04*	0.70–0.99
> 65	0.97	0.84	0.75–1.26
Sex			
Males	*Ref*		
Females	0.92	0.19	0.82–1.04
Nationality			
Non-Saudi	*Ref*		
Saudi	1.01	0.93	0.85–1.20
Year			
2020	*Ref*		
2021	0.90	0.07	0.80–1.01

(*Continued*)

Table 3 (Continued).

Predictors	Adjusted OR	P-value	95% CI
Season			
Winter	*Ref*		
Spring	0.89	0.14	0.76–1.04
Summer	1.06	0.51	0.89–1.25
Autumn	0.98	0.78	0.84–1.14
Business Units			
Central	*Ref*		
Eastern	1.10	< 0.001***	1.59–2.50
Western	1.67	< 0.001***	1.41–1.97
Northern	5.03	< 0.001***	3.88–6.50
Southern	1.53	< 0.001***	1.26–1.87
Type of referral			
Emergency	*Ref*		
Life-saving	2.60	< 0.001***	1.51–4.48
Routine OPD	1.51	< 0.001***	1.29–1.76
Routine admission	1.70	< 0.001***	1.47–1.97
Reason for referral			
Unavailable subspecialty	*Ref*		
Unavailable physician	1.36	< 0.001***	1.17–1.58
Unavailable machine	0.91	0.58	0.67–1.26
Unavailable bed	0.65	< 0.001***	0.52–0.81
Referral Direction			
Internal	*Ref*		
External	0.51	< 0.001***	0.42–0.64

Notes: *Significant difference at $p < 0.05$ and ***significant difference at $p < 0.001$.

Predictors of Acceptance of Psychiatric e-Referral Requests

Table 3 presents the outcomes of the multivariable logistic regression analysis. Age groups, when compared to the reference group (26–35 years), did not uniformly predict acceptance likelihood, with only the (15–25) and (46–65) age groups showing a statistically significant decrease (aOR = 0.84, p-value < 0.05, and aOR = 0.83, p-value = 0.04), respectively. The likelihood of referral acceptance varied significantly among BUs, when compared to the central BU, with a notable five-fold increase in acceptance for referrals originating from the northern BU (aOR = 5.03, p-value < 0.001). The type of referral was a significant predictor, with life-saving referrals having the highest odds of acceptance (aOR = 2.60, p-value <0.001) compared with emergency referrals. Reasons for referral also significantly influenced acceptance rates, notably referrals for unavailable psychiatrists (aOR = 1.36, p-value < 0.001) compared to unavailable subspecialties. The direction of referral was a significant

factor, with external referrals being less likely to be accepted than internal ones (aOR = 0.51, p-value < 0.001). There were no statistically significant differences in sex, nationality, year, and season.

Referrals According to Referral Status Across the Five BUs and 13 Administrative Areas

Appendix 1 details the distribution and acceptance rates of referrals across the five BUs and 13 administrative areas of Saudi Arabia. Acceptance and rejection rates varied significantly across BUs and administrative areas, and these differences were statistically significant at the <0.001 level.

Discussion

This study provides important insights into the utilization and acceptance of psychiatric e-referrals in Saudi Arabia, offering a comprehensive analysis of nationwide data from 2020 to 2021. As the first large-scale study of psychiatric e-referrals in Saudi Arabia, it provides a baseline understanding of e-referral utilization while identifying potential targets for improving coordination of mental healthcare delivery. Our results demonstrate differences in the number of referral requests and acceptance rates influenced by factors such as BU, patient's age, referral type, and referral reason. Overall, this study constitutes an important step in evaluating and strengthening mental health system across Saudi Arabia.

Our study found variations in the referral requests and acceptance rates among the five BUs, with acceptance rates ranging from 72.36% to 92.38%. The overall acceptance rates across the BUs demonstrate SMARC's impact in enhancing access to mental healthcare resources, considering the challenges faced by global health systems in mental health service accessibility.[2,11] However, the lowest acceptance rate for requests originating from the central BU requires further exploration of the referral reasons. A possible explanation could be due to the sufficient availability of mental health resources in the central BU, compared to the other BUs,[28,29] thus reducing the necessity for referrals as resources might be readily available in the originating hospitals. Nevertheless, this system provides a progressive solution through its centralized electronic service platform to coordinate and optimize mental healthcare delivery.

Patients aged 26–35 years demonstrated the highest referral requests and significantly the highest referral acceptance rate. This aligns with previous studies indicating higher prevalence and severity of mental illnesses in young adults.[30,31] Young adults face high-pressure responsibilities, including work–life balance, financial obligations, and caring for both older parents and young children.[32,33] These factors likely contribute to increased mental health service needs and acceptance rates. Given the limited diagnostic data in this study, future studies to comprehensively investigate mental health diagnosis will enable better analysis of the e-referral system in coordinating mental healthcare delivery.

Acceptance rates were equal among both genders and nationalities, demonstrating equality in receiving mental healthcare resources regardless of sociodemographic characteristics. This highlights SMARC's effective functioning and rigorous triaging mechanism based on patients' needs, despite known gender differences in mental healthcare needs and treatment seeking.[34] Similarly, acceptance rates remained stable in 2020 and 2021, despite increased referral volume in 2021 likely due to the COVID-19 pandemic.[2] This underscores the consistent availability of mental healthcare resources before and during the pandemic.[35]

Referral requests slightly varied across seasons, yet no significant seasonal differences were observed in the acceptance rates. This suggests the system is resilient to potential seasonal fluctuations in demand. Wider literature notes seasonal variations in psychiatric admissions and diagnosis patterns in other countries due to environmental factors.[36,37] However, Saudi Arabia's hot climate, with fewer extreme seasonal fluctuations, may account for the consistent referral patterns observed in our analysis.[38] Nevertheless, the absence of significant variations in acceptance rate highlights the system's efficiency in delivering mental healthcare consistently around the year.

All life-saving referrals were accepted, prioritizing acceptance of patients who are in urgent need. Compared to other referral types, life-saving referrals also exhibited the highest likelihood of acceptance. The prioritization of life-saving referrals reflects best practices, as literature shows improved outcomes when critically and mentally ill patients receive prompt care.[39] The high acceptance rate could also be attributed to the triaging process implemented by SMARC, represented by a dedicated hotline to receive and expedite life-saving referral requests acceptance. Despite the triaging system, the complete acceptance of life-saving referrals reflects the capability of the healthcare sector to manage all critically ill mental patients across the country.

Referrals due to psychiatrist unavailability showed significantly higher acceptance odds compared to those due to other referral reasons, demonstrating SMARC's effectiveness in maximizing limited specialist resources. While this finding reflects the documented global challenges in psychiatric workforce recruitment and retention,[40,41] the e-referral system's success in facilitating high acceptance rates suggests its value in optimizing specialist allocation. SMARC's ability to efficiently match patient needs with available psychiatric expertise, complemented by strategic initiatives including expanded training programs, strengthened support staff infrastructure, and technology integration (telepsychiatry and artificial intelligence tools), represents a promising model for improving mental healthcare access. The system's success in coordinating care despite workforce constraints demonstrates how digital health solutions can enhance healthcare delivery even in resource-limited settings.[42,43]

Internal referrals demonstrated higher acceptance rates compared to external referrals (49% more likely), reflecting the inherent complexities of inter-regional transfers. The coordination of external referrals requires sophisticated logistics, particularly given Saudi Arabia's vast geographical expanse, often necessitating aeromedical transport with its associated specialized healthcare teams, travel logistics and associated costs.[44,45] While patient safety considerations and clinical stability requirements can affect eligibility for long-distance transfers,[46] SMARC has successfully facilitated a remarkable 80% acceptance rate for external referrals. This demonstrates the system's effectiveness in coordinating complex inter-regional care transfers and highlights Saudi Arabia's robust healthcare infrastructure in managing nationwide patient mobility.

This study reveals systematic patterns in psychiatric e-referral acceptance rates across Saudi Arabia, offering valuable insights for healthcare resource optimization. SMARC's ability to identify demographic and regional variations enables strategic implementation of targeted interventions, including age-specific support services,[30,31] and optimized resource distribution.[14,29,47] The system's demonstrated success in matching patient needs with available resources[44,46] establishes it as a cornerstone of Saudi Arabia's digital health transformation. SMARC's effectiveness in coordinating psychiatric care delivery provides a proven model for healthcare system enhancement, advancing the nation's commitment to healthcare accessibility, quality, and equity.[35] These findings offer valuable guidance for the continued development and implementation of digital health initiatives nationwide.

This study's findings should be considered within the context of certain limitations. The observational design, while providing valuable insights into referral patterns, limits causal inferences between predictors and acceptance rates. Future prospective, longitudinal studies could strengthen these relationships and provide temporal insights. Future validation through medical record reviews could enhance the accuracy of our e-referral data analysis.[48] Furthermore, the data of this study were restricted to the years 2020 to 2021, which were uniquely impacted by the COVID-19 pandemic, which may affect the generalizability of the findings to other periods. Examining data beyond our study's pandemic timeframe could offer insights into typical referral patterns.[29] Although our regression model adjusted for multiple variables, additional clinical data including diagnostic information and severity measures could enhance understanding of referral decision-making. Mixed methods research exploring provider perspectives could further illuminate referral practices.[49] Nevertheless, this pioneering analysis of SMARC's nationwide psychiatric e-referral data provides a robust foundation for understanding mental healthcare access patterns in Saudi Arabia. The findings offer valuable insights for healthcare system optimization and establish a baseline for future research examining the evolution of psychiatric referral processes.

Conclusion

E-referrals are selectively accepted based on the patient and referral characteristics across Saudi Arabia. Younger (15–25 years) and older (46–65 years) age groups had lower acceptance rates than the 26–35 age group. Referrals for life-saving conditions and those mentioning psychiatrist unavailability had higher acceptance. Internal referrals were accepted more often than external ones. The SMARC e-referral system demonstrates remarkable success in facilitating mental healthcare access through its innovative digital infrastructure, achieving an overall acceptance rate of 82.5% despite global challenges in psychiatric service accessibility. The system's sophisticated triaging mechanisms and automated referral escalation protocols effectively prioritize critical cases while optimizing resource utilization across regions. This digital transformation in healthcare delivery, exemplified by SMARC, provides policymakers with real-time data to inform strategic resource allocation and system enhancements. The study's findings establish a robust foundation for evidence-based policy development in mental healthcare delivery. While future research opportunities exist to enhance the system further through longitudinal studies and expanded clinical data integration, SMARC's demonstrated success in

coordinating nationwide mental healthcare delivery offers valuable insights for healthcare systems globally. The platform's ability to efficiently match patient needs with available resources while maintaining high acceptance rates for critical cases showcases the potential of digital health solutions in advancing healthcare accessibility, quality, and equity.

Disclosure

The authors report no conflicts of interest in this work.

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