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Impact of Telephone Medical Consultation Service (937) on Users' Outcomes in Saudi Arabia: A National Study

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Keywords
Compliance · Enablement · Satisfaction · Saudi Arabia · Telehealth

Abstract

Introduction: One of the telehealth tools is the telephone, which has been used to deliver healthcare in many settings in response to increase demand and pressures on existing health services. This study aimed to explore the impact of telephone medical consultation service (937) on users' outcomes in Saudi Arabia. ***Methods:*** This is a cross-sectional study conducted in Saudi Arabia. Telephone interviews were used to collect data. Study participants were selected randomly from the list of medical consultation users in December 2021. Users' outcome was defined as service accessibility, utilization, user compliance, satisfaction, and enablement. Trained data collectors conducted the interviews between February and September 2022. All ethical issues were considered during the research, and the Statistical Package for Social Sciences (SPSS) v.25 program was used to analyze the data. ***Results:*** A total of 2,534 telephone interviews were completed and analyzed from 5,052 trials with a response rate of 50.2%. Most participants were Saudis (92.7%, 2,348), and (54.4%, 1,379) were females. Study participants used the call either for personal help or to help another family member, and more than one-third (38.8%, 983) had inquiries about COVID-19. Most (91%, 2,306) participants were satisfied with the provided service. Users who had answers to their inquiries and those who followed the provided advice were more likely to be satisfied. However, a positive medical history increases the likelihood of dissatisfaction (p value = 0.027). Users had better enablement after calling the 937 telephone medical consultation center. ***Conclusion:*** Most 937 telephone consultation calls were handled without needing face-to-face visits. Most 937 telehealth service users were satisfied and complied with the health advice.

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Introduction

Telehealth refers to all activities used to provide healthcare at a distance without direct physical contact between the patient and the healthcare provider (HCP). Telehealth includes synchronous (phone and video) and asynchronous (short messaging service, e-consults) communications [1]. Telehealth aims to provide safe, better quality, and cost-effective healthcare in response to the increasing demand and pressures on the existing healthcare system [2, 3]. One of the telehealth tools is the telephone, which used to deliver medical consultations in many settings including routine and emergency care, managing acute and chronic conditions, and provision of health education [4].

Telephone triage and consultation services involve people with a health problem receiving assessment and advice over the telephone. This advice may include a recommendation to visit an emergency department (ED) and make an appointment with an HCP or the administration of certain medication with self-care. As a result, the telephone health services may reduce unnecessary demands on face-to-face healthcare services [5, 6].

Internationally, in 2007, the Australian National Health Call Center Network started the triple zero number (000) to seek help and instructions for nonemergency situations. Expert nurses run this service which is accessible from anywhere within Australia and available over 24 h a day, 7 days a week [7]. Additionally, telemedicine is used by many other countries like the USA and the UK to reduce nonurgent ED visits [8, 9]. A systematic review of articles from several countries focused on crucial governance, quality, and safety findings related to telephone-based health triage and advice services concluded that current evidence does not provide definitive answers to questions about the quality of care provided, access, equity of the service, costs, and outcomes [10].

Saudi Arabia has launched the 937 Call Center telephone health services since 2013; the service includes medical consultation, appointment reservations at primary healthcare centers (PHCCs), anti-smoking clinic appointments, and technical support for Ministry of Health (MoH) e-applications [11]. Two previous studies on the 937 services were recently conducted and published in Saudi Arabia. The first study assessed the population's awareness of the service and showed that the level of awareness and utilization are still low [12]. The other study evaluated the satisfaction of the service users and HCPs with the service, which found a high satisfaction levels among the users and the HCPs [13]. However, the impact of 937 services on the users' outcome has yet to be studied, and it is vital to know its effectiveness and efforts to clarify what benefits are sought. So, this study aimed to explore the impact of telephone medical consultation services (937) on users' outcomes in Saudi Arabia.

Significance of the Study

Although the literature showed the level of utilization and overall satisfaction of 937 medical consultation calling center, no previous study has measured the outcome of the medical consultation service. Our findings are relevant to health policymakers interested in understanding the five integrated users' outcome domains (accessibility, health service utilization, user compliance, satisfaction, and patients' enablement) and the factors affecting them.

Outcomes

The first four study outcomes (accessibility, health service utilization, user compliance, and user satisfaction) were identified in reference to Lake et al. [14] systematic review, while patient enablement was identified in reference to Tolvanen et al. [15].

1. Accessibility: Expanding healthcare access to marginalized populations is a common reason for introducing or expanding telephone triage and advice services. Accessibility will be assessed by exploring the sociodemographic characteristics of 937 Call Center users.
2. Health service utilization: Reducing health service utilization is a common advantage cited for telephone triage and advice services. Therefore, we will estimate healthcare utilization indirectly by measuring patient intention if the 937 services did not exist. This was achieved by asking the participants, "what would you have done if you were not able to reach 937 consultations?"
3. User compliance: Poor health outcomes might result from noncompliance with advice to seek appropriate care. Therefore, assessing patients' willingness to adhere to the advice is essential. Compliance with the advice provided by the 937 Call Center was measured by self-report as entirely, partially, or did not follow the advice.
4. User satisfaction: It refers to the overall affective assessment of the pleasurable level of consumption-related experiences with 937 services. It will be measured by asking the participants to rate their experience as satisfied, neutral, or dissatisfied.

5. Patient enablement: The Patient Enablement Instrument is a self-report measure designed to determine patients' feelings of confidence, ability, and coping following a consultation. The Patient Enablement Instrument addresses patients' ability to understand and cope with their problem/illness after consulting the doctor and the degree to which they can keep themselves healthy, feel confident about their health, and help themselves [15].

The study endeavors to bridge the knowledge gap about these domains and will explore the related problems. The appropriateness of the consultation, safety, and clinical outcomes will not be assessed as it is outside the scope of this research.

Study Objectives

The objectives of the study were as follows:

1. To explore the demographic and medical characteristics of 937 service users.
2. To identify the utilization pattern and alternatives of calling 937 Call Center.
3. To identify the advice the 937 Call Center gave and the degree of users' compliance.
4. To explore patients' satisfaction and the associated sociodemographic characteristics.
5. To assess patient enablement after 937 calls.

Materials and Methods

Study Design

A descriptive cross-sectional phone-based interview was conducted to provide a national assessment of the impact of telephone medical consultation service (937) on users' outcomes (service accessibility, utilization, user compliance, satisfaction, and patients' enablement) in Saudi Arabia.

Sample Size

Due to the study's exploratory nature, there is no formal sample size calculation. According to the assumed response rate of 50%, confidence level of 95%, and 2% margin of error, the appropriate sample size was 2,395.

Sampling Technique

The study included participants who lived in Saudi Arabia, were Arabic speakers, and aged ≥18 years. According to 937 medical consultation center source data, the number of telephone calls during the 4th quarter of 2021 was 1,380,369, including 370,913 calls during December 2021. The study sample was selected randomly from (937) telephone medical consultation service users' list during December 2021 in all 20 health districts across the Kingdom to reach generalizable estimates. These data were the most recent available to minimize recall difficulties. A simple random sample technique (the RANDBETWEEN Function in Microsoft Excel Software) was applied to select an average of 77 subjects' phone numbers each day from the daily list of December 2021.

Table 1. Demographic and health characteristics of study participants (Telephone Medical Consultation 937 users) (*N* = 2,534)

Characteristics	Count	Percent
Gender		
Female	1,379	54.4
Male	1,155	45.6
Nationality		
Saudi	2,348	92.7
Non-Saudi	186	7.3
Age group, mean, SD, years	34.5	9.8
18:20	76	3.0
21:30	952	37.6
31:40	983	38.8
41:50	341	13.5
51:60	133	5.2
≥61	49	1.9
Marital status		
Married	1,875	74.0
Single	545	21.5
Divorced	96	3.8
Widow	18	0.7
Living area		
City	2,177	85.9
Village	357	14.1
Education level		
Bachelor's or higher education	1,705	67.3
High school	648	25.6
Intermediate school	103	4.1
Primary school	49	1.9
Illiterate	29	1.1
Profession		
Employed	1,301	51.3
Not employed	937	37.0
Student	185	7.3
Retired	111	4.4
Medical history		
Without medical history	1,711	67.5
Positive medical history	823	32.5

SD, standard deviation.

Data Collection

All randomly selected 937 service users over December 2021 were contacted by 22 trained research assistants and interviewed over the phone from February to September 2022. Data forms were distributed to the assigned data collectors. No names or other identifiers were registered on the answer sheet, only a unique

reference number for each potential participant. Verbal consent was sought from the participants before commencing the questionnaire.

Data Collection Tool

A structured phone interview questionnaire was designed by the research team to collect the data. The questionnaire was developed based on our previous evaluations of similar services involving phone consultations to assess the previously listed outcomes [14–16].

The questionnaire was reviewed by three experts, including a family medicine specialized team in the 937 medical consultation center, for both face and content validity. The questionnaire was examined on 35 subjects. The data from the pilot study were not included in the main study data. The questionnaire took less than 10 min to complete.

Data Analysis

The collected data were reviewed, coded, verified, and statistically analyzed using SPSS v.28 (IBM Statistics, Armonk, NY, USA). Frequency (*N*) and percentage (%) were used to describe categorical data; mean and standard deviation were used to describe continuous data. The χ^2 test was used for proportion comparisons, the *t* test for means between subgroups of normally distributed numerical data, or the Mann-Whitney test for skewed data. The users' satisfaction was assessed on a dichotomous scale: satisfied and neutral/unsatisfied. The statistical significance level was set at $p < 0.05$.

Results

A total of 2,534 phone interviews were conducted with 937 respondent users. The majority (92.7%, 2,348) were Saudis, and (54.4%, 1,379) were females with a mean age of 34.5 years (standard deviation: 9.8 years; range: 18–85 years). Most users were married (74%, 1,875), living in a city (85.9%, 2,177) and holding a bachelor's degree or higher education (67.3%, 1,705), (51.3%, 1,301) are employed, while (37%, 937) are not. About one-third (32.5%, 823) have a positive medical history of diseases (Table 1).

Table 2 describes the participants' responses to the questions related to the utilization of 937 services. More than half of the responders (56.3%, 1,427) used the call for personal help, and (43.7%, 1,107) called the service to help another family member. Over one-third (38.8%, 983) had inquiries about COVID-19, (20.4%, 518) about child health, and (14.8%, 374) about medication. Regarding the reasons for choosing to call 937 medical consultation center over going to the hospital, (37.8%, 957) answered that they had a simple consultation which does not require going to a health facility, (29.4%, 746) had prior utilization and satisfaction with 937 services, (25.7%, 650) to confirm the need to go to health facility, and (23.8%, 602) due to COVID-19 restrictions and fear of contracting infection.

When the study participants were asked about their alternatives to 937 medical consultation services, (35.8%, 906) would go to the ED at a governmental hospital, (27.3%, 692) to a private hospital or clinic, and (13.1%, 331) to a PHCC. Moreover, 937 Call Center users were asked about the advice they had received from the 937 call. The majority (71%, 1,798) had an answer to their inquiries, (30.7%, 777) took the advice to take the medication at home, and (16.1%, 409) took the advice to book an appointment in the PHCC.

Regarding compliance with the advice provided by 937 medical consultation center, (90.7%, 2,171) of the users ultimately complied with the advice they received; however, (6.9%, 164) did not. The main reason for noncompliance was not agreeing with the advice. The participants were also asked about their satisfaction with the service; (91%, 2,306) were satisfied (Table 3).

Table 4 shows the univariate analysis to examine the relationship between users' dissatisfaction with the service and the study variables. It revealed that a 1-year increase in age and a positive medical history could increase the likelihood of dissatisfaction. However, users who had answers to their inquiries and those who thoroughly followed the advice were more likely to be satisfied. Participants' enablement is shown in Figure 1, almost half (49.5%, 1,254) of participants were much better to understand their health problems after calling 937 telephone medical consultation, more than one-third (36.7%, 931) were much better to deal with their health problems, and (17.5%, 444) were much better to prevent their health problem.

Discussion

Telephone medical consultation services are considered a listening ear to patients' health, which helps provide medical care and consultations and improve home health services for emergency and chronic illnesses in daily life [17, 18]. The use of 937 call medical center services increased during the COVID-19 pandemic to avoid direct contact between patients and healthcare team members [19]. Therefore, telehealth has been employed as a vital tool for efficiently and effectively providing high-quality healthcare to Saudi residents [18].

This study showed that most of the 937 telephone medical consultation users are young married females ranging from 21 to 40 years old. This result is consistent

Table 2. Utilization of telephone medical consultation (937) service (N = 2,534)

Utilized telephone medical consultation 937 service	Count	Percent
For whom was the last 937 medical consultation		
For myself	1,427	56.3
For other family member	1,107	43.7
Users' inquiries*		
COVID-19	983	38.8
Children health	518	20.4
Medications	374	14.8
Gastrointestinal medical consultation	182	7.2
Emergency situation	181	7.1
Pregnancy care/gynecological inquiries	162	6.4
Diabetes or hypertension	150	5.9
Body symptoms (e.g., pain, inflammation, fever)	133	5.2
Allergy	55	2.2
Mental health	38	1.5
Dental medical consultation	26	1.0
Chest disease	24	0.9
Smoking cessation	18	0.7
Reasons to choose to call 937 medical consultation center over going to hospital**		
A simple consultation is not needed for health facility	957	37.8
Prior utilization satisfaction with 937 service	746	29.4
To confirm the need to go to a health facility	650	25.7
COVID-19 restrictions/fear of contracting infection	602	23.8
Far distance of health facility	206	8.1
Fast service	141	5.6
Ease of access	120	4.7
Availability at late time	81	3.2
Long waiting for a hospital appointment	45	1.8
Free of charge	12	0.5
User's alternative to 937 medical consultation service		
Go to an emergency at a governmental hospital	906	35.8
Go to a private hospital/clinic	692	27.3
Go to a PHCC	331	13.1
Calling/going to a pharmacy	162	6.4
Searching on the internet/social media	105	4.1
Requesting the ambulance service	77	3.0
Asking friends/relatives	38	1.5
Go to a COVID-19 vaccination center	35	1.4
Calling a physician	31	1.2
Trying SEHA/Sehaty app	15	0.6
Nothing	142	5.6

*Subject may have more than one user's inquiry. **Subject may have more than one reason to choose to call 937 telephone health service.

with Weber et al. [20], who found that older people (65+ years old) were less likely to use telephone-accessed healthcare compared to those aged 18–49. This could be explained that younger and middle-aged people are more familiar with technology, thus more likely to call and use the service. Meanwhile, most 937 Call Center users were Saudis, perhaps due to the false perception of non-Saudi residents that the service is only for Saudi citizens.

The study findings revealed that most users are employees. Most of the 937 Call Center users had higher education levels, mirroring the results from several other studies [21, 22]. This finding may be because educated people are more likely to use technology-based services. The majority (85.9%) of 937 Call Center users live in urban areas or large cities, matching the urban composition and distribution of the Saudi population [23].

Table 3. Users' compliance and satisfaction toward telephone medical consultations among study participants (N = 2,534)

Users' compliance and satisfaction toward telephone medical consultations 937	Count	Percent
Advise provided by 937 medical consultation service*		
Answer to my inquiry	1,798	71.0
Medication with home care	777	30.7
Booking an appointment in PHCC	409	16.1
Advise to go to an emergency	237	9.4
Requesting the ambulance service	21	0.8
User's compliance to the advice provided by 937 medical consultation service (n = 2,393)**		
I completely followed the advice	2,171	90.7
I partially followed the advice	58	2.4
I did not follow the advice	164	6.9
Reason for partial or noncompliance to the advice (n = 222)		
I do not agree with the advice	104	46.8
Inability to follow advice	61	27.5
Change in health problem	36	16.2
I did not understand the advice	21	9.5
User satisfaction with 937 medical consultation service		
Satisfied	2,306	91.0
Dissatisfied	228	9.0
Neutral	141	5.6
Not satisfied	87	3.4

*Subject may have more than one advice provided by 937 medical consultation service. **114 subjects with not applicable answer (answer for an inquiry).

Table 4. Factors associated with users' dissatisfaction with the provided telephone medical consultation service

Variables	Reference category	Univariate analysis, OR (95% CI)	p value
Gender	Male	1.26 (0.96–1.66)	0.093
Age, years	–	1.01 (1.00–1.03)	**0.048***
Nationality	Non-Saudi	1.34 (0.75–2.40)	0.322
Living area	Village	1.30 (0.85–1.99)	0.223
Education	Bachelor's or higher education	1.17 (0.88–1.56)	0.273
Marital status	Married	0.92 (0.67–1.26)	0.602
Profession	Not employed	1.29 (0.98–1.69)	0.073
Health insurance	No	0.99 (0.68–1.46)	0.974
Medical history	Negative	1.37 (1.04–1.82)	**0.027***
Had an answer to their inquiry	No	0.46 (0.35–0.60)	<**0.001***
Completely followed the advice	No	0.06 (0.05–0.09)	<**0.001***

*Statistical significance was set at $p < 0.05$.

The advice given by 937 included the user himself/herself and his/her family members. Most inquiries were about COVID-19, followed by children's health and then the use of medications.

Regarding the reasons for choosing to call 937 medical consultation center over going to a hospital, more than one-third of study participants reported having simple complaints that they did not need a health facility. This

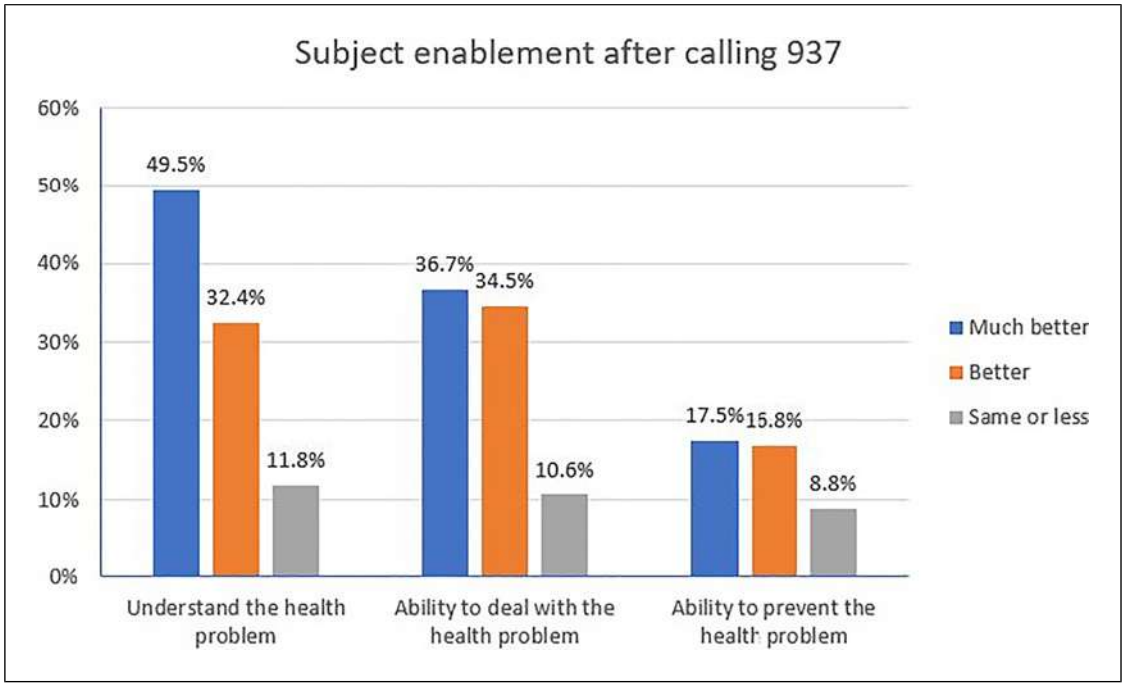

Fig. 1. Subject enablement after calling the 937 telephone medical consultation center.

finding matches that of Tran et al. [8], who confirmed that utilization and compliance with telephone triage advice are influenced by a patient's self-assessment of the needed level of care.

Furthermore, most study participants reported that their inquiries had been answered and they were advised by 937 call to take medication with self-care and to visit PHCC or go to the ED. Two systematic reviews found better compliance with telephone triage advice in patients receiving advice to self-care or to attend ED and lower compliance among those advised to visit a PHCC [24, 25].

The current study examines an important issue: what are the users' alternatives to 937 medical consultation services. Over one-third of users reported going to the ED at a governmental hospital; others reported going to a private hospital or a PHCC. As a result, telehealth services can manage and reduce unnecessary face-to-face interactions that increase the burden on healthcare services [26].

To the best of our knowledge, there is little or no information about users' compliance with the telephone medical consultation service (937) in Saudi Arabia. Indeed, patient noncompliance was associated with the type of advice the user did not agree with or follow. In the same context, compliance in healthcare depends on patient behavior (taking medication, making lifestyle changes, undergoing medical tests, or keeping doctor appointments) [27, 28].

Satisfaction is one of the most studied outcomes for telephone medical consultation services as it enhances service quality [29]. However, this study found a high satisfaction rate and explored the factors associated with users' dissatisfaction. Users who got answers to their inquiries and those who had completely followed the advice were less likely to be dissatisfied. However, patients with a history of chronic disease were more likely to be dissatisfied. This matches the results from a systematic review on telemedicine in otolaryngology, which found higher satisfaction rates among patients and HCPs [30]. Also, Alkhashan et al. [13] found the same results in Saudi Arabia [14].

Regarding patients' enablement after calling the 937 telephone medical consultation center, patients had better enablement to understand their health problems and the ability to deal with their health problems, and to prevent their health problems. Kelly et al. [31] found that consultations in treatment centers were strongly related to lower patient enablement compared to telephone guidance.

However, this is the first study to assess the impact of telephone medical consultation service on users' outcomes in Saudi Arabia, and this study had some limitations. The cross-sectional nature of the study makes causal inferences impossible. The low response rate may limit the generalizability of the study results.

Conclusion

Most of 937 telehealth service users were satisfied and complied with the service. The study predicted some significant factors that may have a negative impact on users' satisfaction, e.g., increase in age and positive medical history. Additional research into sociodemographic heterogeneity and other associated factors in compliance with telehealth advice is needed to prevent potential noncompliance to the provided advice.

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Statement of Ethics

The research proposal has been presented to and approved by the Central IRB of the Ministry of Health, Riyadh, Saudi Arabia (IRB Ref. number: H-01-R-009). Case identities were anonymous throughout the study stages, and confidentiality of the data was maintained as well. Written informed consent to participate was not directly obtained but inferred by completion of the questionnaire. This study followed the Declaration of Helsinki and all applicable local regulations. Data were stored securely and were only accessible by the research team.

Conflict of Interest Statement

The authors have declared no conflict of interest or any competing interests.

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Author Contributions

Walid A.A. Al-Shroby prepared and submitted the IRB-required dossier, validated the study questionnaire, analyzed the data, and drafted the manuscript. Maram E. Bin Dayel and Najla S. Al-Suliman searched the literature, wrote the study proposal, and supervised the data collection. Nuha S. Alhumaid analyzed the data and reviewed the manuscript. Imen S. Sohaibani and Najla J. Alhraiwil reviewed the manuscript and supervised the whole work. All authors contributed to the conception and design of the study, have critically reviewed and approved the final draft, and are responsible for the content and similarity index of the manuscript.

Data Availability Statement

The data that support the findings of this study are not publicly available due to privacy reasons but are available from the corresponding author upon reasonable request.

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