

Effectiveness, Safety and Satisfaction in Teleurology

Thome Barros Junior¹, Marcos Kalaf Farah Albeny², Igor José Caetano De Lima²,
Guilherme Bastos Palitot De Brit², Moacir Cavalcante De Albuquerque Neto²,
Fábio Oliveira Vilar²

¹Federal University of Pernambuco, Recife, Brazil

²Hospital of Clinics of Federal University of Pernambuco, Recife, Brazil

Email: thomepinheirojr@gmail.com, marcos_kfa@hotmail.com, igor.jcl@gmail.com, palitot.guilherme@gmail.com, moacircavalcante@hotmail.com, foliveiravilar@hotmail.com

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Abstract

Introduction: Telemedicine has been used as a tool for improving access to health services worldwide. The aim of the present study is thus to evaluate the effectiveness of urological consultation by videoconference, perceptions regarding safety on the part of medical teams providing video consultation services and patient satisfaction after a urological appointment. **Materials and Methods:** A cross-sectional, observational, and analytical study was carried out with 50 volunteers referred from the basic health unit for a urology appointment. All patients were evaluated remotely by videoconference and in person by different urology teams. **Results:** The study revealed that effectiveness in terms of the degree of match between diagnoses performed by video consultation and those performed in person was 92%. The urology team's perception regarding safety, measured using an in-house safety questionnaire, was high for both videoconferencing and in-person consultations and there was no statistical difference between the two (overall safety score for video consultation compared to in-person consultation was 9.7 ± 0.8 compared to 9.6 ± 0.8 and the p-value was 0.3 for Student's t-test). Patient satisfaction with the appointment was similarly high for both groups, averaging 9.72 ± 0.4 among patients who attended a video consultation and 9.82 ± 0.4 among those whose consultation was conducted in person, with a p-value of 0.10478 for Student's t-test. **Conclusion:** Video consultation in urology is an effective way to perform diagnoses, with high levels of perceived safety among urologists and high satisfaction rates among patients.

Keywords

Urology, Telemedicine, Telecommunications, Appointments and Schedules

1. Introduction

The world health organization (WHO) believes that telemedicine has a role to play in improving access to health services around the world [1]. Telemedicine, or telehealth, refers to any kind of health service provided at a distance, aided by information technology tools, and has been used in many parts of the world, mainly in developed countries [2]. Videoconferencing consultation is one of the telemedicine modalities that most closely resembles an in-person consultation using widely available telecommunication tools such as a smartphone or a portable computer. Despite countless benefits, there is still great resistance among health service providers related to the quality and safety of the information shared, the weakening of the doctor-patient relationship [3], inadequate government oversight, and doubts regarding remuneration for services provided [4] [5].

The SARS-COV-2 pandemic and the need for social isolation have made videoconferencing a safe alternative for bringing people together. Within the health services, this tool has emerged as a way of enabling health services to be resumed both for people with COVID-19 and for those with other conditions requiring care [6]. Video consultation as a telemedicine tool has been introduced in different ways in different countries owing to the peculiar features of different health service regulation agencies around the world [7]. Although telemedicine has been subject to regulation since the 1970s in Brazil, the prescription of treatments and complementary tests by way of telemedicine only received authorization in 2020 as a result of the SARS-COV-2 pandemic [8].

Video consultations have been employed in a variety of different scenarios and specialties. In urology, a number of experiences have been published that demonstrate that remote consultations have been adopted as institutional policy in a manner similar to in-person consultations regardless of the patient's profile [9]. There are also published accounts of such experiences in relation to the management of prostate cancer [10] [11], urinary incontinence [12], urinary infection, hematuria [13], urinary lithiasis [14] [15], benign prostatic hyperplasia and lower urinary tract symptoms [16], erectile and ejaculation dysfunction [17], and in the field of pediatric urology [18] [19].

The Federal University of Pernambuco's Hospital das Clínicas has been providing remote health services through RedeNUTES since 2003. RedeNUTES provides tele-education, teleconsultation, tediagnosis and remote tracking services [20]. The urology department at HC-UFPE has a broad-ranging accumulation of experience in telementoring for surgical procedures [21] and urodynamic studies [22] [23]. In a highly populous country of continental dimensions, such as Brazil, video consultations can play an important role in improving access to health services. Information on efficiency, safety and patient satisfaction with regard to such consultations in urology is essential for their introduction into routine care.

2. Materials and Methods

After ethical board approved, a cross-sectional, analytical, descriptive study was carried out with 50 patients referred from primary health care units for urology care, this being the only selection criterion. The sample size calculation was performed using the formula proposed by Zar to compare the proportions of the same population [24]. A maximum error of 10% and a confidence level of 90% were considered, suggesting the minimum sample of 41 individuals however for this research we increased the number to 50. Patients were invited to attend a urological appointment by video consultation before or after an in-person consultation at the urological service of the Federal University of Pernambuco in November 2021. The two appointments were conducted by different urology teams, each comprising one medical resident and one preceptor. To reduce selection bias, half of the patients first received an in-person consultation followed by a remote consultation via videoconference, while the other half first received a videoconference consultation and then attended in person. In an attempt to minimize the influence of the first consultation, the interval between the appointments did not exceed one week. The urological staff were given full autonomy in conducting consultations and allowed to employ auxiliary tools such as symptom questionnaires, a voiding diary, and the like. At the end of the consultation, the urological team filled out an in-house safety questionnaire and the patients answered a question about satisfaction.

Diagnoses were tabulated and compared between the groups and categorized as: 1) a complete match: when all the patients' diagnoses were the same; 2) a partial match: when at least one diagnosis was the same; and 3) no match: when the diagnoses were different. The care provider's perceptions regarding safety were assessed using a two-question questionnaire designed by the researchers to ask about the safety of diagnoses performed and medical decisions taken. The answers were ranked on a Likert scale from 1 to 5 and the sum of the two responses, ranging from 2 to 10, provided the overall safety index (Figure 1).

Patient satisfaction was assessed using the Net Promoter Score (NPS), a tool used to measure the satisfaction and loyalty of users regarding any service provided [25]. Patients were asked the following question: on a scale of 0 to 10,

Question 1: <i>How safe do you feel the diagnoses performed during this appointment were?</i>	Score 1
(1) Totally unsafe (2) Partially unsafe (3) indifferent (4) Partially safe (5) Totally safe	
Questions 2: <i>How safe do you feel the medical decisions taken in this appointment were?</i>	Score 2
(1) Totally unsafe (2) Partially unsafe (3) indifferent (4) Partially safe (5) Totally safe	
Overall safety index (sum of score 1 and 2)	

Figure 1. Urological team in-house safety questionnaire.

based on your experience of this medical appointment as a whole, how likely would you be to recommend this form of medical care to a friend or colleague (Figure 2)? The NPS provides users with a range of options regarding satisfaction with and loyalty to the service provided ranging from 0 to 10 and these are then grouped into three classes: promoters (for responses of 9 or 10 on the scale); indifferent or neutral (for scores of 7 to 8); and detractors (for scores of 0 to 6) [26].

Categorical variables were described in proportions and tested by the chi-square method. Numerical variables were described as means and tested using the T-student.

3. Results

Fifty patients, 35 male and 15 female, were included in the present study. Their ages ranged from 18 to 84 years and the average age was 52.8 ± 14 years. Twenty-four patients had concluded high school (48%), 16 had concluded elementary school (32%), five (10%) held university degrees, and 10% (5 patients) had received no schooling at all.

Thirty-eight of the patients attended via video consultation and 37 of those attended in person received only one diagnosis; 12 patients in both groups received two diagnoses and one patient attended in person received 3 diagnoses. Sixty-four diagnoses provided via in-person consultation and 62 by video consultation for the same 50 patients. The diagnoses matched to some degree in 46 patients (92%), matching fully in thirty-nine patients (78%) and partially in seven (14%). The diagnoses failed to match in four patients (8%).

Evaluation of the medical decisions taken during the consultations provided the following information. Twenty-two of the patients (44%) received some kind of guidance regarding hygiene, diet or behavior; complementary tests were requested from 16 (32%); and 10 (20%) had some medication prescribed when attended by videoconference. In the in-person consultations, on the other hand, forty-one (82%) patients received advice on hygiene, diet and/or behavior, complementary tests were requested for 35 (70%) and medication was prescribed in ten cases (20%). The proportion of patients receiving guidance on hygiene, diet or behavior and the proportion of those for whom complementary tests were requested were both higher when the same patients were attended in person and this difference was statistically significant (p-value = 0.00008 and 0.0001, respectively, using the chi-square test). However, the percentage receiving a prescription

Question: *On a scale of 0 to 10, considering your complete experience with this medical appointment, how likely would you be to recommend this form of medical care to a friend or colleague?*

0	1	2	3	4	5	6	7	8	9	10
Not at all likely						Extremely likely				

Figure 2. Patient's satisfaction questionnaire.

for medication was no different when the same patient was seen by video consultation and in person (p-value = 0.24) (**Table 1**).

The average overall safety indices for the video and in-person consultation groups were 9.7 ± 0.8 and 9.6 ± 0.8 respectively, with a p-value of 0.3 for Student's t test. The averages for the diagnosis safety score and medical decisions safety score were 4.8 ± 0.4 and 4.7 ± 0.5 , with a p-value of 0.2, and 4.8 ± 0.3 and 4.9 ± 0.4 , with a p-value of 0.3, respectively, neither being statistically different according to Student's t test (**Table 2**).

Table 1. Results-epidemiology, schooling, effectiveness on diagnoses and medical decision.

Patients (n)	50		
Male Gender (%)	35 (70%)		
Age-years (av \pm sd)	52.8 ± 14		
(min-max)	(18 - 84)		
Level of Schooling	None	5 (10%)	
	Elementary school	16 (32%)	
	High school	24 (48%)	
	University degree	5 (10%)	
Number of diagnoses performed by video and in-person			
Diagnosis rate	Video consultation	In-person	
1) Diagnoses/patient	38	37	
2) Diagnoses/patient	12	12	
3) Diagnoses/patient	0	3	
Total (diagnoses/group)	62	64	
Diagnosis match rates			
Complete match	39 (78%)		
Partial match	7 (14%)		
No match	4 (8%)		
Comparison of medical decisions taken during video and in-person consultations			
	Video consultation	In-person	p-value
Guidance on behavior, hygiene or diet n (%)	22 (44%)	41 (82%)	0.00008
Complementary tests requested n (%)	16 (32%)	35 (70%)	0.0001
Prescription of medication n (%)	10 (20%)	15 (30%)	0.24

The groups were statistically tested using chi-square.

Table 2. Results of safety questionnaire.

	Video consultation	In-person	Student's t test p-value
Overall safety index av ± sd	9.7 ± 0.8 (7 - 10)	9.6 ± 0.8 (6 - 10)	0.3
Diagnosis safety score av ± sd	4.8 ± 0.4 (3 - 5)	4.7 ± 0.5 (2 - 5)	0.2
Medical decision safety score av ± sd	4.8 ± 0.3 (3 - 5)	4.9 ± 0.4 (3 - 5)	0.3

The groups were statistically tested using student's t test.

The average score for patient satisfaction (NPS) was 9.72 ± 0.4 and 9.82 ± 0.4 for the video consultation group and in-person consultation group, respectively, and there was no statistical difference when compared using Student's t test (p-value = 0.10478). The results for the NPS applied to the volunteer patients showed that the majority were classified as promoters, with 92% and 98% giving a score of 9 or 10 in in-person and remote consultations, respectively; while 8% and 2% were classified as neutral or indifferent (providing a score of 7 or 8), and none provided a score of 6 or less (which would have classified them as detractors) for either form of consultation (**Table 3**).

4. Discussion

The present study covered patients with urological complaints referred from basic health units. Most were men in the fourth and fifth decades of life and with varying levels of schooling. This population was therefore broadly representative of a real situation at a tertiary urology service. A high degree of agreement was found between videoconference and in-person consultations regarding diagnosis and a similar rate of prescription of medications. However, patients attended in person were more likely to receive guidance regarding hygiene, diet and behavior and or to have complementary tests requested. Physicians perceived patient safety for both approaches to be high. Neither were there any statistically significant differences in their responses to an in-house safety questionnaire. Patients reported high levels of satisfaction irrespective of the approach adopted.

The high rate of agreement between the approaches with respect to diagnosis (92%) may reflect the effectiveness of the video consultation. These findings are similar to those of Chu *et al.*, who identified a 90% agreement rate between diagnoses made by videoconference and in person [9]. Likewise Sherwood *et al.*, who provided remote care for prison inmates, found a rate of agreement between diagnoses made by video consultation and in person of 90%, with a decrease in the need for in-person consultations. These authors thus estimate that 50% of urological complaints could be conducted exclusively through telemedicine [27]. No recommendations were provided regarding the standard methodology to be used for consultations, and medical teams thus had complete freedom

Table 3. Results for patient satisfaction according to NPS.

	Video consultation	In-person	p-Value
Promotor (answers 9 - 10)	46 (92%)	49 (98%)	
Neutral (answers 7 - 8)	4 (8%)	1 (2%)	
Detractor (answers 0 - 6)	0	0	
NPS (average \pm sd)	9.72 \pm 0.4	9.82 \pm 0.4	0.10478

The groups were statistically tested using student's t test.

and autonomy as to how to provide care, reinforcing the finding that video consultation and in-person consultations demonstrate similar efficacy in producing diagnoses.

The present study found a higher frequency for requesting complementary tests and guidelines when consultations were carried out in-person, as also observed by Mehrotra *et al.*, who compared the results of 99 online healthcare visits to 2855 in-person consultations of patients with urinary infection at the University Medical Center Pittsburgh [28]. In theory, the larger number of requests for complementary tests provides additional clinical information but increases the indirect costs associated with the consultation. More extensive provision of advice regarding hygiene, diet and behavior should, in theory, also enhance the perceived quality of in-person consultations and this element of video consultations thus needs to be improved. However, the relative paucity of studies of the behavior and attitudes of health professionals and patients in various care environments and the outcomes of these consultations does not enable any clear conclusion to be drawn by way of explanation of this result. The creation of protocols and flows of care based on scientific evidence may, however, make it possible to minimize the differences between these two forms of medical consultation.

Doctors were found to believe that the level of safety both of diagnoses and medical decisions was high. To evaluate this, a questionnaire was created containing two questions related to the perception of safety, with answers ranked on a 5-point Likert scale. This tool enabled us to identify medical teams whose ultimate perception of the quality of care necessitated an intervention to ensure a safer outcome and to investigate any possible lapses regarding safety. The perception of safety and satisfaction among service providers is a tool used in business to identify obstacles and resistance to internal processes [29]. Recently, robust questionnaires have been developed to evaluate the degree of applicability, satisfaction and quality regarding interaction in the doctor-patient relationship [30] [31]. The publication, translation, and cross-cultural adaptation of these questionnaires are important for standardizing research and building a larger

body of scientific evidence.

Patient satisfaction was assessed using the NPS, which measures users' satisfaction with and loyalty to service. Similarly, high rates of satisfaction were found for both video and in-person consultations, as observed in other studies that evaluated the satisfaction of patients in medical consultations for general urological complaints [9], in the management of prostate cancer [32], in the assessment of hematuria [33], in the management of urinary incontinence in elderly women [12] and in the psychotherapeutic management of erectile dysfunction and premature ejaculation [17]. The high overall satisfaction index may also be related to the sample of patients being composed exclusively of users of the Brazilian National Health System, who have poor access to health services and minimal choice. The limitations of the study are mainly related to the small sample size and the fact that it was developed in a single center.

Telemedicine is also an effective strategy for reducing waiting times for specialized consultations, as observed in another study in the south of Brazil [34]. It may also provide an alternative method for following up on patients treated in referral centers [35] and its use should be systematically extended throughout the Brazilian health care routine. Further studies of medical consultation by video conference in urology, nevertheless, need to be conducted before this tool can be universally applied.

5. Conclusion

Video consultation is a new tool in Brazil but has demonstrated similar effectiveness to that of in-person consultation in producing diagnoses. Physicians who performed consultations by videoconference were found to consider the level of safety of these consultations to be high and patients reported high levels of satisfaction with video consultation. Further studies need to be conducted as a way of laying the groundwork for improving and expanding the use of this kind of remote medical consultation.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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