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ORIGINAL PAPER

Perceptions and attitudes toward the use of telemedicine for the postoperative outpatient urological care during the COVID-19 pandemic in an Academic Hospital in Southern Italy

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Summary

Introduction: Telemedicine is a most used tools in various medical and surgical scenarios.
The aim of the present study was to explore attitudes and perceptions by urologic patients toward the use of telemedicine in the context of patient-physicians communication during the post-operative follow-up in a large academic tertiary urology referral department in Italy.
Materials and methods: An anonymous questionnaire consisting of 15 multiple choice questions was designed including three sections: respondents' demographics, attitudes, and perceptions towards the use of telemedicine. Invitations to participate to this anonymous questionnaire was given to outpatients attended at Urology Department, University of Naples Federico II.
Results: In total 697 responses were received (participation rate 73%). The frequency of telemedicine use was described as frequently, occasional, rarely, and never by 41.6%, 30.4%, 15.1%, and 12.6% of respondents, respectively. WhatsApp messenger used by 59.5% of respondents and telephone call (34.3%) were the most common type of tools. Satisfaction in using telemedicine was reported as very satisfied, satisfied, neutral, dissatisfied, and very dissatisfied by 39.6%,41.4%,10%,7% and 2% of respondents respectively. Overall, 43.7%% of participants individuated limited interaction and risk of misdiagnosis as the major limit of telemedicine.
Conclusions: Telemedicine represents the future of medical practice due to several benefits as well as convenience, increased access to care and decreased healthcare costs.

KEY WORDS: Telemedicine; Telehealth; Healthcare; Virtual Healthcare; Urology.

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INTRODUCTION

Telehealth represents a rapidly evolving field of medicine. It is defined as the use of information technology and telecommunications to provide access to health assessment, consultation, diagnosis, intervention, super-vision, and information across distance (1, 2). Telemedicine refers specifically to remote clinical services and was first adopted in the 1950's when an American psychiatrist connected to a prison through a closed-circuit television to provide mental health services (3).
In recent years, with the advancement of mobile technologies, the adoption and accessibility of telemedicine has significantly increased, after COVID-19 pandemic declaration in several clinical and surgical fields including urology (4-10). Advantages of remote care include reduction of the use of resources in health centers, improving access to care (3). Moreover, telemedicine has the potential to reduce the risk of direct transmission of infectious agents (11). Approximately 15 million Americans receive remote medical assistance yearly (2). The urological literature on telehealth is sparse. The telemedicine experience in urology spans from new patient consultations to telesurgery to post-operative rounds and even virtual house calls (12).
In details, telemedicine has been described in patients with hematuria, prostate cancer, urinary stones, pelvic organ prolapse, urinary infections, and urinary incontinence (2).
The aim of the present study was to explore attitudes and perceptions by urologic patients toward the use of telemedicine in the context of patient-physicians communication during the post-operative follow-up in a large academic tertiary urology referral department in *Italy*.

MATERIALS AND METHODS

Questionnaire

An anonymous 15 multiple choice questions (formulated in Italian with the aim of increasing the response rate) questionnaire was administered to a total of 955 patients who had visited the outpatient *Department of Urology at University Federico II, Naples*, from September 2020 to April 2021 The questionnaire was composed of three sections: a first one to assess respondents' demographics (age, sex, urologic disease) a second one to evaluate their attitudes using telemedicine, and a third to evaluate per-

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ceptions towards telemedicine. Questions about attitudes toward use of telemedicine included: tools adopted (telephone call, e-mails, *WhatsApp*, others), context in which telemedicine was used, content of multimedia data shared.
Questions about perceptions investigated the perceived usefulness of telemedicine and the potential developments.
Respondents were invited to "*strongly agree*", "*moderately agree*", "*slightly agree*", "*strongly disagree*", "*moderately disagree*", "*slightly disagree*" with a series of statements about perceptions. Some questions required a single answer while others gave the respondents the choice to select as many answers as they felt appropriate.

Data analysis

Data were expressed as mean (*Standard Deviation*) and raw numbers and percentages of survey answers. Statistical analyses were two-sided using a significance level of 0.05.
All statistical analyses were performed with SPSS version 17.0 (*SPSS, Inc., Chicago, IL*) software.

Results

In total 697 responses were received (participation rate 73 %). All patients were Caucasian.
Of them, 572 patients (82%) were male and 125 (18%) were female. Mean (SD) patients' age was 67.5 (5.3) years. In details the number of patients aged between 18-34, 35-54, 55-74, and those aged > 75 were 12 (1.7%), 16 (2.3%), 466 (66.8%), and 203 (29.1%), respectively.
Concerning educational level, the number of patients with elementary school or no title, middle school diploma, high school diploma, and university degree were 104 (15%), 139 (20%), 175 (25%), and 279 (40%), respectively.
As regards the occupational status of respondents, the number of them working, retired and unemployed were 367 (52.6%), 265 (38.1%), and 65 (9.3%), respectively.
The disease for which patients received outpatient post-operative care were bladder cancer (n = 209, 30%), prostate cancer (n = 160, 23%), kidney cancer (n = 69, 10%), testis cancer (n = 4, 0.5%), penis cancer (n = 2, 0.3%), obstructive uropathy (n = 105, 15%), urolithiasis (n = 69, 10%), urinary tract infections (n = 4, 0.5%) and others (n = 75, 10.7%). Overall, 267 patients (38.3%) were in the early post-operative follow-up (within 30 days from surgery) and 430 (61.7%) in the late post-operative follow-up (> 30 days from surgery).
Table 1 describes attitudes toward the use of telemedicine.
Figure 1 describes the frequency of telemedicine use according to patients' age.
Perceptions about the usefulness and limits of telemedicine in the context of outpatient post-

Table 1.
Attitudes of patients toward telemedicine.

	N (%)
Frequency of telemedicine use	
Frequently	290 (41.6)
Occasionally	212 (30.4)
Rarely	109 (15.7)
Never	86 (12.3)
Use of telemedicine during the COVID-19 pandemic compared to the pre-pandemic period	
Increased	387 (63.4)
Remained stable	159 (25.9)
Decreased	65 (10.7)
Purpose of availing telemedicine facility	
Booking and appointment	246 (40.2)
Consultation	322 (52.7)
Treatment	43 (7.1)
Tools adopted	
Telephone call	209 (34.3)
WhatsApp messages	364 (59.5)
Video-call	24 (3.9)
e-mail	2 (0.3)
Other	12 (1)
Media-contents shared	
Video	3 (0.8)
Audio	129 (32.1)
Text	220 (54.7)
Photo	50 (12.4)
Reason for not using telemedicine	
I don't know the existence of this type of medical service	42 (48.9)
I don't know how to use this type of medical service	19 (22.5)
I don't trust telemedicine	13 (14.7)
My technical conditions do not allow me to use telemedicine	8 (9.3)
Other reasons	4 (4.6)
Willingness to continue using telemedicine after COVID-19 pandemic	
Yes	416 (68.1)
Not	195 (31.9)
Satisfaction with telemedicine use	
Very satisfied	242 (39.6)
Satisfied	253 (41.4)
Neutral	61 (10)
Dissatisfied	43 (7)
Very dissatisfied	12 (2)

Figure 1.
Percentage of telemedicine use according to patients' age.

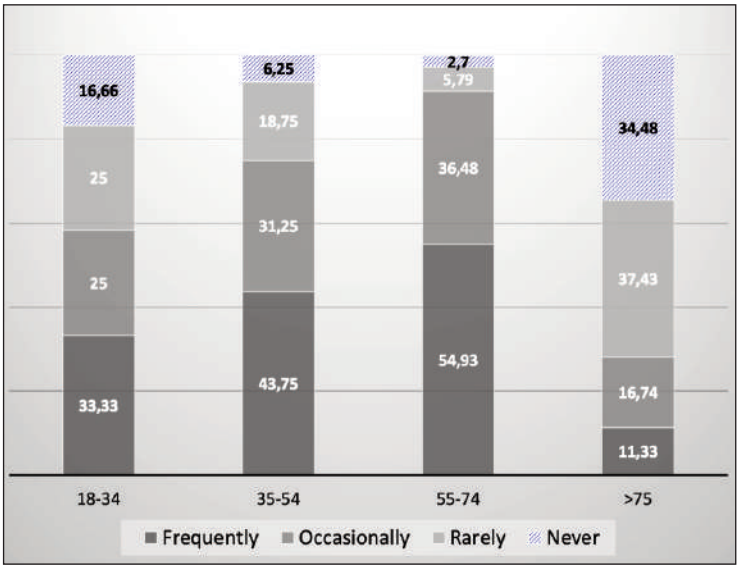
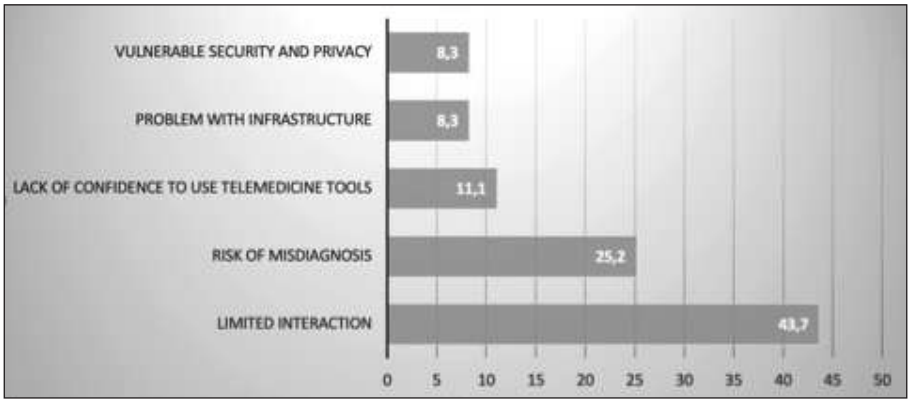


Table 2.
Perceptions about the usefulness and limits of telemedicine in the context of outpatient post-operative follow-up of urological patients (n = 697).

	Agree strongly N (%)	Agree moderately N (%)	Agree slightly N (%)	Disagree slightly N (%)	Disagree moderately N (%)	Disagree strongly N (%)
Telemedicine, in combination with in-person appointments, is useful in improving patient- physician communication in the post-operative period	229 (32.9)	264 (38)	75 (10.8)	87 (12.5)	26 (3.7)	16 (2.1)
Telemedicine, in combination with in-person appointments, is useful in improving the quality of assistance in the post-operative period	248 (35.6)	196 (28,1)	111 (15,9)	86 (12.3)	35 (5.1)	21(3)
Telemedicine, in combination with in-person appointments, is useful in improving the interpretation of findings from laboratory and radiological investigations	222 (31.7)	175 (25.1)	139 (20)	139 (20)	15 (2.2)	7 (1)
Telemedicine, in combination with in-person appointments, is useful in improving the interpretation of clinical findings	211 (30.3)	158 (22.6)	189 (27.1)	114 (16.4)	18 (2.6)	7 (1)
Telemedicine, in combination with in-person appointments, is helpful in reducing unnecessary visits to hospitals	306 (43.9)	175 (25.1)	111 (16)	70 (10)	35 (5)	0 (0)
Telemedicine, in combination with in-person appointments, is helpful in reducing costs of post-operative follow-up	258 (37)	141 (20.2)	203 (29.1)	63 (9)	32 (4.7)	0 (0)
Telemedicine, in combination with in-person appointments, is helpful in improving patients' adherence to prescriptions	315 (45.3)	227 (32.6)	72 (10.3)	57 (8.2)	26 (3.6)	0 (0)
Telemedicine, in combination with in-person appointments, is helpful in helps in the prompt recognition of complications and side effects	256 (36.8)	154 (22.1)	104 (14.9)	111 (15.9)	72 (10.3)	0 (0)

Figure 2.
Percentage of patients reporting specific limitations in availing telemedicine (n = 611).



operative follow-up are reported in Table 2. Figure 2 describes the percentage of patients reporting specific challenges in availing telemedicine.

Discussion

In the last years, several surgeons have incorporated telemedicine into pre- and post-operative visits and specialty consultations (13). The use of telemedicine modalities for perioperative care has been reported to represent a cost-effective strategy and has been associated with a relatively high rate of patient satisfaction (13).
Urologists described the successful use of telemedicine in several settings: shared decision-making counseling for prostate cancer treatment, administration of behavioral therapies for urinary incontinence, and post-operative follow-up care (13). More recently, The COVID-19 pandemic has radically changed the landscape of health care and has further stimulated the use of telemedicine (13-14). Attitudes and perceptions toward the use of telemedicine by patients varies significantly across the word and according to the setting of adoption. To our knowledge this represents the first time a survey investigating the attitudes and perceptions about telemedicine by urology patients referring to an outpatient department in Southern Italy.
Interestingly, 72% of respondents declared to having frequently or occasionally used telemedicine during the COVID-19 pandemic.
Not surprisingly, the percentage of patients declaring to use telemedicine rarely or never increased with increasing age with most patients never using medicine being aged > 75 years. Of note, about half of patients declaring to have never used telemedicine did not know the existence of this type of medical service.
These findings point out the current limits of telemedicine, mainly il old people, for which lack of knowledge and confidence with telemedicine may represent a significant barrier.
Whatsapp messenger was the most frequently adopted tool by respondents during remote communication.
Accordingly, a comprehensive systematic review presented compelling evidence that WhatsApp Messenger is a promising system when used as a communication tool between health care professionals and the general public (15).
Limited patient-physician interaction and risk of misdiagnosis were perceived as limitations of telemedicine by most respondents. Accordingly, many criticize that telehealth may adversely affect continuity of care. Online interactions are perceived as impersonal and dangerous because the virtual provider does not offer the benefit of a complete medical history and physical examination (15-18). Therefore, telehealth should be considered as

an adjunct and best used to supplement in-person visits (15). Although vulnerable security and privacy was perceived as a limit of telemedicine by only 8.3% of patients, this issue deserve careful attention. According to *Morris et al.*, despite the widespread use of WhatsApp, clinicians are either failing in their ethical, legal, regulatory, and clinical responsibility to keep records of *WhatsApp* consults, or are not reporting how they do so or that they do so (19). Unfortunately, the literature does not report any clear "*best practices*" for recordkeeping, or the secure storage of patient information obtained and there is a need to raise awareness on this issue and to urgently provide viable guidance (19). Interesting is patient satisfaction with use of telemedicine. We reported an overall good satisfaction using this technology: 39.6% and 41.4% of respondents reported satisfaction and very satisfaction respectively. Our data corroborated results of previous published studies. *Holzman et al.* reported high grade of satisfaction with telemedicine compared to in person visits in pediatric urology outpatient patients (20). A high satisfaction of patients in telehealth experience compared to in person visit were also reported by *Polinski et al.* and by *Ambrosini et al.* (21-22). Despite advantages using telemedicine, some disadvantages and barriers as well as performing physical examinations, possibilities for technical difficulties, security breaches, and regulatory barriers have been reported (23). Limited interaction and misdiagnosis were the most reported barriers in our survey, 43.7% and 25.2% respectively. The topic is very important with several legal and economic aspects.

Our data corroborated findings reported in previous studies: *Chandhanayingyong* reported an overall misdiagnosis rate of 40%, with over-diagnosis of 12% and under-diagnosis of 27% using teleconsultation using the mobile phone *multimedia messaging service* (MMS) in emergency orthopedic patients (24). *Spear at al.* in a survey on 781 patients that experienced telemedicine, reported as main disadvantages the lack of hands-on care, the lack of intimacy, and technical difficulties (25). Our study has some limitations: first of all, the simple size represents a small group of the providers in the academic setting, and it is limited to academic urology experience. Telemedicine represents the future of medical practice including several benefits as well as convenience, increased access to care and decreased healthcare costs. Further studies are necessary to improve clinical, administrative, and research aspects to expand the use of telemedicine among patients.

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