







## Original Article

# Patients' perceptions of quality of care delivery by urology residents: A nationwide study

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## Objective

To present the results of a nationwide survey among urological patients to evaluate their perception of the quality of care provided by residents.

## Methods

An anonymous survey was distributed to patients who were referred to 22 Italian academic institutions. The survey aimed to investigate the professional figure of the urology resident as perceived by the patient.

## Results

A total of 2587 patients were enrolled in this study. In all, 51.6% of patients were able to correctly identify a urology resident; however, almost 40% of respondents discriminated residents from fully trained urologists based exclusively on their young age. Overall, 98.2% patients rated the service provided by the resident as at least sufficient. Urology trainees were considered by more than 50% of the patients interviewed to have good communication skills, expertise and willingness. Overall, patients showed an excellent willingness to be managed by urology residents. The percentage of patients not available for this purpose showed an increasing trend that directly correlated with the difficulty of the procedure. Approximately 5–10% of patients were not willing to be managed by residents for simple procedures such as clinical visits, cystoscopy or sonography, and up to a third of patients were not prepared to undergo any surgical procedure performed by residents during steps in major surgery, even if the residents were adequately tutored.

## Conclusions

Our data showed that patients have a good willingness to be managed by residents during their training, especially for medium- to low-difficulty procedures. Furthermore, the majority of patients interviewed rated the residents' care delivery as sufficient. Urology trainees were considered to have good communication skills, expertise and willingness.

## Keywords

urology residents, urological education, survey, patient's perspective, #Urology

## Introduction

Resident doctors are physicians involved in supervised training before beginning autonomous practice. Although residents are involved full time in patients' care, their role is somewhat underestimated [1]. According to the latest report of the Association of American Medical Colleges, nearly 140 000 medical residents worked across the USA in 2020, making them an indispensable element of the healthcare system [2]. The space reserved for residents in meetings, associations and scientific journals has increased greatly. Simultaneously, investigations into the various aspects of training and quality of life of trainees are also increasing [3–8]. Despite this recent interest from the scientific community, reports on patients' perspectives about the quality of the service provided by trainees are lacking. In the context of patient-centred healthcare, an analysis of patients' perceptions about residents could provide important feedback to improve the quality of the training itself, as well as supply information about the quality of care offered in academic hospitals.

We present the results of a survey among urological patients to evaluate their perceptions of the quality of care provided by residents. The secondary endpoint was to evaluate patients' and willingness to be managed by urology trainees.

## Methods

### Study Design

This was a multicentre cross-sectional study. Delegates of the Italian Residents Committee (Senato degli Specializzandi) and the Italian Society of Urology designed a paper survey for patients of academic institutions (Table S1).

The anonymous survey was distributed between February 2018 and March 2018 to patients referred to 22 Italian academic institutions. The study was conducted according to the principles of the Helsinki Declaration. According to Italian law, institutional review board approval was waived due to the cross-sectional, observational nature of this research.

The survey was administered to patients in paper form. In the waiting room for outpatient visits, as well as for inpatient and outpatient diagnostic and/or surgical procedures, or upon discharge from the ward, a nurse handed the patients the questionnaire and a pen and invited them to respond anonymously away from the sight of their medical colleagues.

The patient was invited to post the answer sheet in a special box placed in the wards and/or clinics of the urology department. At the end of the study period, the boxes were opened, and the anonymous answers were collected.

The survey investigated how patients perceived the figure of the urology resident, and consisted of six parts, as follows:

- Part 1: General information about the respondents (gender, age, type of disease, education, job, type of management).
- Part 2: The patients were asked to define resident in urology.
- Part 3: A brief description of the resident's role and duties was provided to the patients.
- Part 4: The patients rated the service provided by the resident (1 = insufficient, 2 = sufficient, 3 or 4 = good/excellent).
- Part 5: The patient's willingness to be treated by a resident for different interventions and procedures was assessed. These were multiple-choice questions with the following possible responses: 0 = I do not know the procedure/I'm unsure; 1 = No; 2 = Yes; 3 = Yes, but only by a senior resident; 4 = Yes, but only if the resident is tutored.
- Part 6: Patient preferences regarding residents' gender were assessed.

Minor surgical procedures were defined as surgery involving superficial structures of the body and carrying a low risk of serious complications (i.e., circumcision, varicocele, etc.). Major surgical procedures were defined as invasive operative surgeries in which a body cavity is entered, organs or parts of organs are removed, or normal anatomy is altered (i.e., nephrectomy, prostatectomy, etc.). Intermediate surgical procedures were defined as all endoscopic surgeries (i.e., transurethral resection of bladder tumour, TURP, ureteroscopy, etc.) and other procedures not classifiable as minor or major.

### Statistical Analysis

Continuous variables were summarized as medians and interquartile ranges (IQRs) and categorical variables as the number of subjects and percentage values. For the analysis of Part 4, the questions ranked on a 1–10 scale were categorized as follows: scores  $\leq 5$  were considered as insufficient; scores between 6 and 8 were considered as sufficient; scores  $\geq 9$  were considered as good. For the analyses of Part 5, we tested two hypotheses. First, we postulated that an increasing proportion of patients would not be willing to be treated by residents with increasing difficulty of procedure. To test this

hypothesis, we relied on the Cochran–Armitage trend test. Second, we used univariable and multivariable logistic regression models to test possible predictors of patients' willingness to be treated by a resident. For the purpose of these analyses, the answers to the multiple-choice questions of Part 5 were re-coded in order to obtain a binary (Yes/No) outcome. Specifically, 'I don't know the procedure/I'm unsure' answers were discarded, 'No' answers were kept as they were, and 'Yes', 'Yes, but only by a senior resident' and 'Yes, but only if the resident is tutored' answers were grouped into a single 'Yes' answer. Covariates included in the multivariable regression models were: age (continuously coded), gender, education (defined as elementary school, middle school, high school, or university), employment status (employed, freelance, retired, unemployed, student), type of disease (non-oncological vs oncological), type of visit (first vs follow-up), type of admission (hospitalization, outpatient visit, diagnostic procedure), resident identification (correct definition [i.e. 'A medical school graduate and doctor in training who is taking part in a 5-year programme to become an urologist'] vs others). Results of the multivariable logistic regression models were also summarized with a forest plot. For all statistical analyses, the R software environment for statistical computing and graphics (version 3.4.3) was used. All tests were two-sided with a level of significance set at  $P < 0.05$ .

## Results

### Questionnaire Summary

A total of 2587 patients were enrolled in this study. The demographic and clinical characteristics of the study participants are summarized in Table 1A. Briefly, the median (IQR) age of the respondents was 65 (53–72) years, male respondents greatly outnumbered female respondents (74.3% vs 25.7%), and the majority of respondents had at least a high school qualification. The majority of patients (1334, 51.6%) correctly identified the urology resident as a 'fully-fledged doctor' (Table 1B); however, almost 40% of respondents discriminated residents from fully trained urologists based exclusively on their young age. Overall, 98.2% patients rated the service provided by the resident as at least sufficient (scores  $\geq 2$ ; Fig. 1A). Urology trainees were considered to have good communication skills, expertise and willingness by more than the 50% of the patients interviewed (Fig. 1B).

### Trends and Predictors of Patients' Willingness to be Treated by Residents

Overall, the patients showed an excellent willingness to be a passive participant in the residents' training. The percentage of patients not available for this purpose showed a statistically significant increasing trend ( $P < 0.001$ ) with greater difficulty

of the procedure (Fig. 1B). Specifically, approximately 5–10% of patients were not willing to be managed by residents for simple procedures such as a clinical visit, cystoscopy or sonography, up to a third were not prepared to undergo a surgical procedure performed by residents during steps in major surgery, even if the residents were adequately tutored (Fig. 1b). Of note, most respondents ( $n = 2071$ , 80.1%) did not show a preference with regard to being treated by a male or a female resident.

### Diagnostic Cystoscopy

Regarding willingness to undergo cystoscopy performed by a resident (Fig. 2, Table S1), multivariable logistic regression analysis showed that only female sex (odds ratio [OR] 0.69, 95% CI 0.52–0.92;  $P = 0.012$ ) was a negative predictor, while being retired (OR 1.50, 95% CI 1.00–2.24;  $P = 0.050$ ), having an oncological disease (OR 1.63, 95% CI 1.12–2.22;  $P = 0.001$ ) and ability to correctly define a resident (OR 1.61, 95% CI 1.22–2.16;  $P = 0.001$ ) were positive predictors.

### Diagnostic Imaging

We evaluated patients' willingness to undergo ultrasonography performed by a resident (Fig. 2, Table S1). Multivariable logistic regression analysis showed that female sex (OR 0.63, 95% CI 0.44–0.91;  $P = 0.012$ ) and being visited in the outpatient setting (OR 0.66, 95% CI 0.43–0.99;  $P = 0.048$ ) were negative predictors, while ability to correctly define a resident was a positive predictor (OR 2.61, 95% CI 1.79–3.85;  $P < 0.001$ ).

### Outpatient Clinical Consultation and Surgical Procedures

In Fig. 2, we report patients' willingness to attend an outpatient visit with a resident. On multivariable logistic regression analysis, female sex (OR 0.51, 95% CI 0.36–0.73;  $P < 0.001$ ) and attending a follow-up visit (OR 0.69, 95% CI 0.48–0.97;  $P = 0.035$ ) were negative predictors, while older age (OR 1.02, 95% CI 1.00–1.03;  $P = 0.009$ ) having an oncological disease (OR 1.53, 95% CI 1.04–2.27;  $P = 0.034$ ) and ability to correctly define a resident (OR 4.27, 95% CI 2.90–6.43;  $P < 0.001$ ) were positive predictors.

We also tested patients' willingness to undergo a minor outpatient procedure performed by a resident. On multivariable logistic regression analysis, female sex (OR 0.72, 95% CI 0.56–0.94;  $P = 0.013$ ) and attending a follow-up visit (OR 0.75, 95% CI 0.58–0.95;  $P = 0.018$ ) were negative predictors of patients' willingness to be a participant in residents' training in cystoscopy while ability to correctly define a resident (OR 1.41, 95% CI 1.10–1.80;  $P = 0.006$ ) and

**Table 1** Summary of (A) demographic and clinical characteristics and (B) questionnaire results of study participants (*N* = 2587).

<b>(A) Demographic and clinical characteristics</b>	
<b>Gender, <i>n</i> (%)</b>	
Female	666 (25.7)
Male	1921 (74.3)
<b>Age, median (IQR), years</b>	
	65 (53–72)
<b>Education, <i>n</i> (%)</b>	
Elementary school	355 (13.7)
Middle school	743 (28.7)
High school	939 (36.3)
University	550 (21.3)
<b>Job, <i>n</i> (%)</b>	
Employee	682 (26.4)
Self-employed	423 (16.4)
Pensioner	893 (34.5)
Unemployed person	241 (9.3)
Student	348 (13.5)
<b>Pathology, <i>n</i> (%)</b>	
Prostate cancer	282 (10.9)
Suspected prostate cancer	118 (4.6)
Bladder cancer	562 (21.7)
Urolithiasis	397 (15.3)
BPH/prostatitis	509 (19.7)
Upper tract urothelial carcinoma	39 (1.5)
Urological infections	164 (6.3)
Kidney cancer	157 (6.1)
Incontinence	131 (5.1)
Minor pathologies	117 (4.5)
Andrological diseases	89 (3.4)
Traumas	22 (0.9)
<b>Clinical evaluation, <i>n</i> (%)</b>	
First urological evaluation	1192 (46.1)
Follow-up	1395 (53.9)
<b>Visit type, <i>n</i> (%)</b>	
Hospitalization	950 (36.7)
Outpatient visit	1179 (45.6)
Diagnostic procedure	458 (17.7)
<b>(B) Questionnaire results</b>	
<b>The urology resident is... <i>n</i> (%)</b>	
...a medical student	436 (16.9)
...a voluntary, unpaid doctor	140 (5.4)
...a urologist with little experience	214 (8.3)
...a medical school graduate and doctor in training who's taking part in a 5-year programme to become a urologist	1334 (51.6)
...a specialist urologist ( $\leq 35$ years old)	463 (17.9)
<b>How do you recognize a resident in urology?, <i>n</i> (%)</b>	
I do not know/I do not understand it	372 (14.4)
He/she introduced himself/herself as a resident in urology	652 (25.2)
From his/her young age	1017 (39.3)
From the label on the gown/different uniform	546 (21.1)
<b>Would you prefer to be treated by a male resident or a female resident?, <i>n</i> (%)</b>	
Male	360 (13.9)
Female	156 (6.0)
No difference	2071 (80.1)

older age (OR 1.01, 95% CI 1.00–1.02;  $P = 0.018$ ) were positive predictors.

### Inpatient Surgical Procedures

Patients' willingness to undergo minor surgery performed by a resident was also assessed (Fig. 2). On multivariable logistic regression analysis, female sex (OR 0.64, 95% CI 0.50–0.83;

$P = 0.001$ ), attending a follow-up visit (OR 0.69, 95% CI 0.52–0.91;  $P = 0.008$ ) or undergoing a diagnostic procedure (OR 0.70, 95% CI 0.49–0.99;  $P = 0.042$ ) were negative predictors of patients' willingness to be a participant in residents' training in minor surgery, while ability to correctly define a resident was the only positive predictor (OR 1.73, 95% CI 1.35–2.23;  $P < 0.001$ ).

Regarding patients' willingness to undergo middle/endoscopic surgery performed by a resident, on multivariable logistic regression analysis, being female (OR 0.78, 95% CI 0.62–0.98;  $P = 0.030$ ), attending an outpatient visit (OR 0.62, 95% CI 0.49–0.79;  $P < 0.001$ ) or undergoing a diagnostic procedure (OR 0.72, 95% CI 0.53–0.97;  $P = 0.034$ ) were negative predictors. Conversely, being a student (OR 1.53, 95% CI 1.04–2.26;  $P = 0.031$ ), having oncological pathology (OR 1.48, 95% CI 1.18, 2.26;  $P = 0.001$ ) and ability to correctly define a resident (OR: 1.39, 95% CI 1.12–1.72,  $P = 0.002$ ), were positive predictors.

We also assessed patients' willingness to be a participant in residents' training during steps in major surgery. On multivariable logistic regression analysis, female sex (OR 0.80, 95% CI 0.66–0.98;  $P = 0.027$ ) was a negative predictor, while having oncological pathology (OR 1.30, 95% CI 1.08–1.57;  $P = 0.007$ ) was a positive predictor of patients' willingness to be participant in such training.

### Discussion

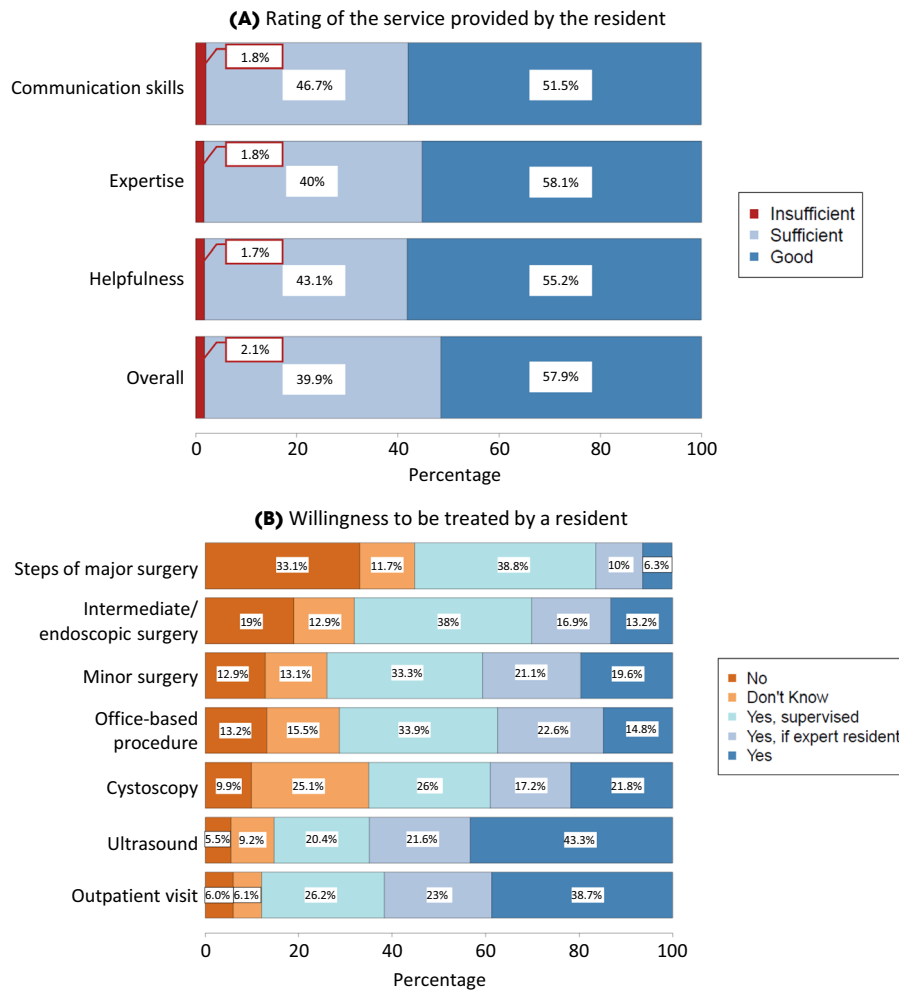
To the best of our knowledge, our cross-sectional multicentre study is currently unique. Patients showed poor knowledge of the definition of a resident in urology, but when they were correctly informed, they demonstrated good willingness to be managed by residents.

In recent years, much attention has focused on many aspects of the training process, such as surgical and academic aspects, and residents' various problems [9–12]. However, while it has been demonstrated that urology resident involvement is not associated with increased overall and surgical complications [13], very few studies have evaluated the training of surgical and urology residents from the point of view of the patient, who is a passive participant in their medical education.

While the process of surgical training is well understood by those who undertake this path, the roles and responsibilities may not be as clear to the passive participant in this training: the patient.

Previous studies have shown that most patients do not understand the different levels of physician training [14,15]. Our data show that only approximately 50% of patients correctly identified the urological specialist as a 'fully-fledged doctor', while almost 40% of respondents discriminated residents from fully trained urologists based exclusively on their young age. It seems that too many urological patients

**Fig. 1** Bar chart showing (A) patients' rating of the service provided by the residents and (B) patients' willingness to be treated by a resident.



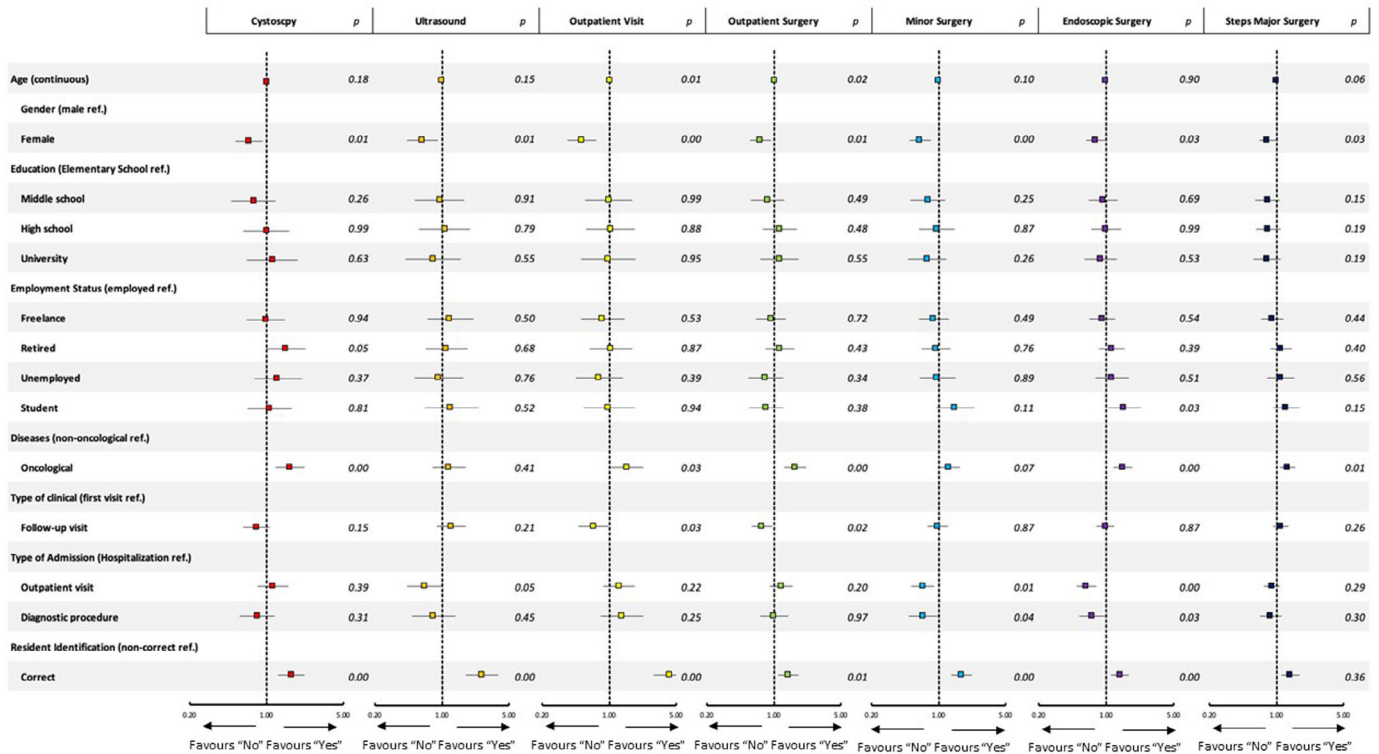
do not sufficiently understand the role, experience and qualifications of the resident. In accordance with our study findings, Huynh et al. [16] found poor understanding and appreciation of the term ‘registrar/resident’. Similarly, and possibly even more importantly, our results clearly show that the only modifiable factor influencing patients’ willingness to be participants in residents’ training was the correct identification of residents and understanding of the residents’ role. It is noteworthy that only a quarter of patients recognized a resident in urology because the residents introduced themselves as such. Thus, we believe that, when introducing themselves to the patients, trainees should inform them of their status and role in the medical team. Furthermore, academic institutions should also implement other measures to make patients aware of residents’ status and roles, for example, by use of information panels, labels on uniforms, or even colour codes on uniforms.

Our data showed that patients rated the residents’ service as sufficient. Urology trainees were considered to have good

communication skills and expertise by more than 50% of the patients interviewed. There is a scarcity of data regarding doctor–patient communication during urology residency [17–21]. Regarding other specialties, previous studies have reported a downward trend in the empathic communication skills of physicians during medical residency. We were not able to assess and compare this trend through our study design, and this was not our aim. However, being empathetic, having good communication skills, might be considered a good starting point to support possible implementation of the training process and satisfactory feedback.

To the best of our knowledge, our study is the first to evaluate patients’ perspective regarding surgical residents on a nationwide scale. Previously, Huynh et al. recruited a small sample of urology patients in order to assess their acceptance of surgical trainees in an Australian private hospital setting [16]. They found increasing acceptance of registrars in private hospitals when consultant involvement was emphasized. Furthermore, surgical assistance and performance of minor

**Fig. 2** Forest plots showing hazard ratios, their respective 95% CIs and *P* values of the logistic regression models testing possible predictors of patient's willingness to be treated by a resident for various urological procedures.



steps in surgery by trainees was well accepted. Overall, in our study, patients showed good willingness to participate in residents' training. The percentage of patients not available for this purpose showed an increasing trend directly correlated with the difficulty of the procedure. As demonstrated by multivariate analysis performed for different procedures, andrological patients, incontinent patients, and those with suspected prostate cancer or upper tract urothelial cancer were among those least likely to be managed/co-managed by trainees.

The present study has some limitations. The centres involved did not provide an equal number of patients. This could impact the data, given that the socioeconomic and cultural backgrounds of the different areas of the country can differ quite considerably. Another limitation is the lack of a control group (i.e., urology consultants) regarding the evaluation of empathy and the quality of care/assistance offered by the trainee.

In conclusion, this is the first national study evaluating patients' acceptance of being a passive participant in urology residents' training. Our data showed that patients have a good degree of willingness to be managed by residents during their training, especially for medium- to low-difficulty procedures. Furthermore, most patients interviewed rated the residents' care delivery as sufficient. The urology trainees

were considered to have good communication skills, expertise and willingness.

## Disclosure of Interests

The research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Abbreviations: IQR, interquartile range; OR, odds ratio..

## Supporting Information

Additional Supporting Information may be found in the online version of this article:

**Table S1.** Multivariable logistic regression models testing for predictors of patients' willingness to be part of residents' training.