

# Patients' satisfaction with and awareness of electrical stimulation therapy

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## Abstract

**Introduction.** The study purpose was to investigate the effects of electrical stimulation therapy (EST) and to examine whether the patients' awareness of and satisfaction with EST changed with gender, education level, information on treatment, and number of sessions.

**Methods.** The Electrotherapy Questionnaire, prepared by the researchers, consisting of 20 closed-ended questions, was applied to the participants. A total of 531 volunteers who had completed the physiotherapy program and received EST treatment were included in the study. Pearson's correlations were used to assess the associations between satisfaction and awareness and gender, education level, number of treatment sessions, and information on treatment.

**Results.** The mean age of the patients was  $45.4 \pm 5.1$  years. Overall, 57% of the participants stated that they did not know the purpose of EST; 77% were satisfied with EST; 47.5% maintained that the transmission gel used during EST applications had a healing effect. A significant positive correlation was found only between increasing physiotherapists' explanations and patients' satisfaction ( $r = 0.166, p < 0.05$ ).

**Conclusions.** Patients' expectation bound with the treatment and their desire to be informed were found to be high. The proportion of those who benefited from EST turned out high. It was shown that patients' awareness of EST and their perceived wellness were improved by informing the patients about the purpose of the treatment.

**Key words:** electrical stimulation therapy, awareness, patients' views, satisfaction

## Introduction

Electrotherapy is a component of physiotherapy treatment techniques. Electrophysical modalities play a well-established role within physiotherapy practice. The use of electrical stimulation therapy (EST) has a historically important part in physiotherapy [1]. Dennis [2] suggests that in Australia, up to 61% of patients' clinical time is devoted to electrotherapy treatment. The effectiveness of electrotherapy as a physiotherapeutic option remains unclear. But the clinical usefulness of electrotherapy modalities, e.g. transcutaneous electrical stimulation, laser and ultrasound therapy, therapeutic ultrasound, low level laser therapy, pulsed electromagnetic field therapy, and neuromuscular electrical stimulation, for pain and musculoskeletal injuries is very common [3]. In general, these are most appropriately applied as an adjunct to other therapies. Used with suitable modality and parameters, electrotherapy may have an effect on the patients' well-being [1].

As healthcare practice has become more patient-centred, patient satisfaction has emerged as a critical outcome of care [4, 5]. Patients' views about their healthcare are intrinsically important to clinicians [6]. Evaluation of patient satisfaction and awareness with regard to physiotherapy care can provide specific and objective information to clinicians about the services they provide [7–9].

Patient satisfaction with musculoskeletal physiotherapy care has been investigated in many countries, as synthesized in a recent systematic review [10]. Each study reported a lack of public awareness of physiotherapy, and consis-

tently recommended wider marketing of the profession [11, 12]. In 2004, the annual report of the American Physical Therapy Association emphasized a number of strategies being used to highlight physiotherapy to the American public [13].

Studies have shown that the most well-known cases treated by physiotherapists are musculoskeletal injuries, the least known being women's and children's disorders. In these areas, it has turned out that the level of physiotherapists' awareness of the practices they perform is inadequate. The public awareness of physiotherapy was found to be higher in the areas of massage, hot application, exercise, and manipulation [14]. The patient population and education level are also important for the awareness [15].

Physiotherapists should be conscious of the changes in healthcare expectations of the community. It seems that the demand of the public for explanation and information from healthcare professionals is rising. The control of the patients over the treatment is increasing, they want to know what kind of treatment is needed and expect preventive and protective advice from physiotherapists. The public awareness in studies investigating the awareness of physiotherapy was found to be 96%. The awareness related to the treatments given by physiotherapists and the cases that would be treated is also explored. While the awareness of the community was higher in the applications of massage and exercise treatment by physiotherapists, about half of it was found in EST applications [14].

EST is a treatment method widely used in clinics, aiming to contribute to the treatment of various diseases by applying electrical currents to the body through different agents

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by various clinicians [16]. At present, awareness regarding the field of electrotherapy is limited by the modality usage in physiotherapy clinics.

Physiotherapists graduate with the knowledge of the characteristics of the currents and devices they use, the proper application methods, the detailed indications and contraindications of currents. In this context, this study was planned to determine the awareness and satisfaction of patients who were administered EST recently.

The level and determinants of patient satisfaction with musculoskeletal physiotherapy care were studied before [15]. However, in Turkey, there has been no previous quantitative evaluation of patient satisfaction with and awareness of EST.

Our study was conducted to determine patients' satisfaction and awareness regarding EST, which is one of the applications of physiotherapy and rehabilitation and a therapeutic and diagnostic method frequently used in many diseases in clinics. It was investigated whether the patient satisfaction and awareness related to EST changed depending on the patients' perception in terms of gender, education level, information about treatment, and number of treatment sessions.

## Subjects and methods

The study was conducted in outpatient units of various health centres in Gaziantep in the period from June 2016 to April 2017. Patients who were aged 18 years or older, were outpatients owing to various musculoskeletal conditions and completed their physical therapy session, were Turkish-speaking with the ability to read, understood the nature of the study, provided informed consent, and volunteered to participate in the study were included. Those who had any known psychiatric or cognitive deficits were excluded.

The questionnaire was created by researchers with at least 10 years of experience. We consulted 15 experts (clinicians, academicians, and biostatisticians); 8 experts accepted to interview. All interviews were conducted individually. Three clinicians shared their own experiences gained during at least 15 years of work in a department of electrotherapy. Three contributing academicians working in a department of physiotherapy and rehabilitation had the title of professor. Two biostatisticians provided assistance with regard to measurement and evaluation. The process was completed within 6 months. The questionnaire was used to assess the awareness of and satisfaction with electrotherapy treatment. It consisted of 20 closed-ended questions that the patients answered.

Criterion-related validity could not be achieved as there were no questionnaires available investigating patient satisfaction and awareness referring to EST. One study used visual analogue scales to measure clinicians' perception of the efficacy of lasers, but did not assess validity [17].

A total of 531 volunteers who had completed the physiotherapy program and only had EST treatments and home exercise program in physiotherapy were included in the study, with their anonymity preserved. The number of treatment sessions, application body areas, and the health personnel who applied EST modalities were recorded. The participants were asked whether they had been informed about the treatment and if they had had knowledge about the currents applied to them. The patients' thoughts about the effectiveness of EST and satisfaction were collected.

The questionnaire was compiled to include 2 sections. Section 1, consisting of 10 items, addressed demographic details such as age, gender, education level, application body areas, number of treatment sessions, EST modalities, trans-

mission gel and perceived healing effect, devices and probes of EST, having EST at home. Data were collected via closed-ended categorical and yes/no questions. Section 2, consisting of 3 items, investigated the subjects' having information on EST, their knowledge of EST, and their satisfaction. The questionnaire was administered face to face to the volunteers.

## Statistical analysis

The demographic characteristics, means and standard deviations, gender, education level, application body areas, number of treatment sessions, EST modalities, transmission gel and perceived healing effect, devices and probes of EST, having EST at home, having information on EST, knowledge of EST, and satisfaction were defined by number and percentage.

Pearson's correlations were used to assess the associations between satisfaction and awareness and gender, education level, number of treatment sessions, and information about treatment. The SPSS 21.00 package software was applied in the data analysis. The value of  $p < 0.05$  was accepted as the statistically significant level.

## Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Human Research Ethics Committee of Hasan Kalyoncu University with the registration number 2016/08.

## Informed consent

Informed consent has been obtained from all individuals included in this study.

## Results

A total of 531 patients with the mean age  $\pm$  standard deviation of  $45.4 \pm 5.1$  years participated in our study; 319 (60%) were females and 212 (40%) were males. The socio-demographic characteristics of the participants and treatment data are reported in Table 1.

As shown by the results of the study, the number of EST sessions in the patients' treatment equalled 13–20 in 44.6%, 1–12 in 34.5%, 21–30 in 16.8%, and over 30 in 4.1%. It was found that the number of sessions that the patients wanted to receive was higher. In this respect, 41.8% of the participants wanted to take 21–30 sessions.

A total of 64% of the patients were informed about the treatment before and after the session, while 36% were not informed.

As for the medical personnel applying EST modalities, these were physical therapy technicians in 41.6%, physiotherapists in 25.4%, intern physiotherapists in 22.4%, and nurses in 9.4%. When asked 'Who do you want EST modalities to be applied by?' 68.2% of the respondents stated that EST should be applied by physiotherapists.

When asked if transmission gel was used during the placement of the electrodes in the treatment, 68.4% of the patients indicated the application of transmission gel, and 47.5% confirmed its healing effect.

The patients were asked about the methods, devices, and probes of EST modalities in the questionnaire, together with their pictures. In this respect, 39.2% of the subjects had an ultrasound probe, 18.8% had a vacuum electrode, 54%

Table 1. Socio-demographic and clinical characteristics of the participants

Variable		n (%)
Age (years, $\bar{x} \pm SD$ )		45.4 $\pm$ 5.1
Gender	Female	319 (60)
	Male	212 (40)
Education level	Illiterate	42 (68.9)
	Primary school	99 (81.1)
	Middle school	30 (81.1)
	High school	100 (76.3)
	Associated degree/postgraduate	122 (79.7)
Electrical stimulation therapy application areas	Neck	127 (24)
	Shoulder	112 (21)
	Low back	180 (34)
	Hip	11 (2)
	Knee	101 (19)
Knowledge of electrical stimulation therapy		228 (43)
Satisfaction with electrical stimulation therapy		409 (77)
Treatment sessions	1–12	183 (34.5)
	13–20	237 (44.6)
	21–30	89 (16.8)
	Over 30	22 (4.1)
Information about treatment		339 (64)
Who applied modalities	Physical therapy technicians	221 (41.6)
	Physiotherapists	135 (25.4)
	Intern physiotherapists	119 (22.4)
	Nurses	50 (9.4)
Used transmission gel		363 (68.4)
Perceived healing effect of transmission gel		251 (47.5)
Electrical stimulation therapy devices and probes	Ultrasound probe	208 (39.2)
	Vacuum electrode	100 (18.8)
	Adhesive electrode	287 (54)
	Shortwave diathermy probe	29 (5.5)
	Laser probe	19 (3.6)
Electrical stimulation therapy device at home		36 (6.8)

'No' answers and missing replies were excluded.

Table 2. The relationship between gender, education level, number of treatment sessions, and informational parameters – and satisfaction and awareness

Factor	Satisfaction		Awareness	
	Pearson's correlation	p (2-tailed)	Pearson's correlation	p (2-tailed)
Gender	-0.049	0.263	0.064	0.141
Education level	-0.045	0.299	-0.016	0.706
Treatment sessions	-0.009	0.839	-0.005	0.903
Information on treatment	0.166	0.000*	0.055	0.210

\* p < 0.05

had an adhesive electrode, 5.5% had a shortwave diathermy probe, and 3.6% had a laser probe.

Overall, 93.2% of the patients stated that they did not have any portable EST device at home.

The areas where EST was applied were low back (34%), neck (24%), shoulder (21%), knee (19%), and hip (2%). When the patients were questioned about the purpose of EST application, 57% of them stated that they did not know the purpose. A total of 77% were satisfied with EST. No correlation was observed for the patients' satisfaction depending

on gender ( $r = -0.049, p > 0.05$ ), education level ( $r = -0.045, p > 0.05$ ), or treatment session ( $r = -0.009, p > 0.05$ ). Again, no correlation was found between the patients' awareness and the same parameters ( $r = -0.064, p > 0.05; r = -0.016, p > 0.05; r = -0.005, p > 0.05$ , respectively). A significant positive correlation was found between increasing physiotherapists' explanations and patients' satisfaction ( $r = 0.166, p < 0.05$ ). The relationship between gender, education level, number of treatment sessions, and informational parameters – and satisfaction and awareness is reported in Table 2.

## Discussion

Our study is the first to investigate the satisfaction with and awareness of outpatient EST in the Turkish population.

The increase in the elderly population also brings with it a rise in the prevalence of musculoskeletal problems in the society. This topic provides a common application area by allowing physiotherapists to use their knowledge and experience more effectively. There are also potential situations in children and women's healthcare areas where there is less public awareness. In the future, the community will need to be informed about the diversity within physiotherapy in line with their increasing needs.

Electrotherapy is defined as the use of various currents, which are called electrophysical agents, for evaluating, treating, and preventing electrophysiological and biophysical energy deficits, activity limitations, and limitations of participation [1]. EST is a treatment method used alone or in combination with physiotherapy, applied on the basis of evidence by physiotherapists and in some centres by emergency medicine and physical therapy technicians. In some cases, it is also known that this method, which exerts a considerably large impact, has a placebo effect in terms of its contribution to the patient's well-being [18].

In the literature, it has been observed that studies on satisfaction with and awareness of physiotherapy applications are mostly carried out among non-occupational health personnel and health students; no studies have been found that would involve the treated patients [19–21].

In a study that investigated the awareness and knowledge of physiotherapy practices and treatment modalities among assistant doctors, it was concluded that 67% of EST was effective on physiotherapy. The same study revealed that EST applications were used mostly to reduce pain; with the least frequency, they aimed at inflammation reduction [20].

Another study questioned whether physiotherapy was effective in electrodiagnostic evaluation, which takes place in the field of EST. Overall, 75% of physicians knew that physiotherapy was competent in finding sensory and motor stimulation potentials by electromyography and various tests [20]. Doctors turned out to have little knowledge on the treatment modalities used by physiotherapists [21]. The fact that health personnel who work together in many fields do not have knowledge about the methods they apply can result in an inefficient use of knowledge and skill. In this case, it is inevitable to conclude that the patients who receive health service are inadequately informed about physiotherapy applications. It may be claimed that people who have received any physiotherapy modality have better awareness in the field. The fact that the patients who answered the questions in this study had received EST resulted in finding their awareness and knowledge level higher than expected. The level of satisfaction was higher in the group in which information about the treatment had been given.

In our study, we observed that the level of education or gender had no effect on the efficacy of the treatment.

Treatment sessions are applied in accordance with the numbers determined by the government. Generally, the number of sessions in the treatment of a single area varies between 15 and 20. The average number of physical therapy sessions among our study participants was  $18.3 \pm 5.2$ , with 79% of the subjects maintaining that 21–30 sessions would be more effective. According to the results of the study, an increase in the number of sessions did not lead to any change in the level of satisfaction perceived by the patients.

Informing the patients about the applied treatment and

method in detail is considered to be beneficial to minimize the placebo effect because the transmission gel, which is solidified water that is applied in order to increase the conductivity of the electrodes during treatment, is perceived to have a healing impact by 47% of the patients. For this reason, informing the patient in detail will contribute to a better understanding of the purpose and the elimination of allergic reactions.

It is essential that the patient be examined and the proper diagnosis given as to which tissues are involved and need to be treated [1]. The conclusion that only 43% of patients received information about the treatment is attributed to the lack of time required to provide the necessary clarification by physiotherapists because of the high number of patients in clinics. On the other hand, the satisfaction rate was up to 77% and it is seen that the majority of patients benefited from EST. Furthermore, our results are parallel to high outpatient satisfaction findings of a study from Turkey [22, 23]. However, significantly lower mean satisfaction scores were noted in two studies [24, 25]. Some research revealed that effective therapist-patient communication was a key determinant of high satisfaction [10, 26]. Our results did not show gender-related differences in satisfaction. This aligns with previous research into gender-related differences in patient satisfaction [10, 27].

Low back, neck, and extremities are the areas where musculoskeletal injuries mostly occur. According to the results of the study, EST was most often applied to these regions. Other application possibilities are intra-abdominal, nerve, bladder, and ganglion. These are not preferred because of the lack of knowledge and awareness on the methods to be performed in these areas, and the pain and limitations experienced in the low back, neck, and extremities result in applying physical therapy in outpatient clinics at first.

We believe that the patients' awareness of and satisfaction with EST applications, which have different therapeutic effects and are implemented on the basis of the clinical chart and symptoms of the patient, will increase the effectiveness of the treatment.

## Limitations

Although these views are representative of a large population, they only relate to Turkish physiotherapy patients. In addition, because of the limited number of references in this field, there were difficulties in determining the criteria. The COSMIN checklist method was not used during the creation of the questionnaire; it was formed by interviewing the experts individually. In the following studies, the COSMIN checklist method can be applied to review the questions and validate the questionnaire.

## Conclusions

The areas where physical therapy modalities are most commonly used are low back, neck, and knee. It has been found that these applications are the most effective and that the number of sessions does not increase the well-being in the treatment. Patient expectations and desire to be informed were found to be high. A considerable proportion of the respondents benefited from EST. The patient's perceived well-being with the EST application is improved when the patient is informed about the purpose of the treatment, about their condition, about the treatment plan, and about the patient's role in the management of their condition. We believe that exercise programs to be applied together

with EST modalities will improve the effectiveness of treatments and decrease the number of long sessions, and that with more studies to be conducted in this area, the patients' awareness and satisfaction with regard to EST may be increased. These results may be useful in providing a benchmark of patient satisfaction for clinics, professional physiotherapy associations, and those who fund physiotherapy services.

### Disclosure statement

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### Conflict of interest

The authors state no conflict of interest.

### Explanation

This study was presented as a verbal statement at the 1<sup>st</sup> International Health Sciences and Life Congress in May 2018 in Burdur, Turkey.

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