Evaluation of Technical Training Given to Medical Diagnostic Ultrasound
Appliance Users: A Preliminary Study

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Abstract: The medical ultrasound devices have been getting new features day by day for the diagnostic of a disease such as anatomical imaging, blood-flow measurement and evaluation of physiology in almost all aspects of medicine. The device training is generally given to ultrasonography practitioners by the application specialist of the related company in order to use all the features of the ultrasound device. In this study, a basic performance evaluation by an application specialist was conducted to determine the degree of comprehension of the given education. In this way, the ability of physicians to use the devices and the quality of the education provided were analyzed by statistical methods according to device trademark, operator's (physician) specialty and gender. The results indicate that viewing setting of the device (p<0.032) and using device new features are statistically significant difference for device trademark (p<0.039). Also, all evaluation questions except two questions about using device new features and possession of device 3D-4D techniques are statistically significant difference for operator's (physician) gender. Additional research is necessary to increase sample (person) size to determine the quality of the education provided.

Keywords: Medical ultrasound, Training, Evaluation form

1 INTRODUCTION

Medical ultrasound is a unique device that allows the internal structure of the body to be visualized [5]. Because of this, the use of medical ultrasound device is increasing day by day in medicine since there are developments in nearly all medical fields for diagnostic purposes [2].

The theoretical basis of ultrasound is partly given to medical students [1]. However, the use of ultrasonography as a physician requires advanced technical and medical knowledge. Operating the device with this advanced technical and medical information requires high quality and skill. In addition, with the developing technology, physicians need to update their knowledge and skills [3]. At the same time, device trademark has been developing ultrasound devices according to updating technique and knowledge and add new modules [6].

Ultrasound training for surgeons has been performed for the past two decade [4]. The trainings are examined in the scientific studies from many different perspectives. However, none of these studies cover technical training. In this study, a technical evaluation of the training given for the medical ultrasound device will be performed.

2 MATERIAL AND METHOD

An ultrasound application specialist who knows almost all the devices on the market, who is one of the contenders, provide training for the physicians the devices ordered by them. The market, who is one of the contenders, provide training for the physicians the devices ordered by them. The physicians who are filled out for the evaluation form by the application specialist work in three departments where ultrasound device is most used: gynecology, radiology and cardiology. This training, given by the application specialist, covers the examination of the patient together physicians after the introduction and overview demo of the devices are explained. During the examination, the application specialist directs the user according to the requested data at the examination. At the end of one day training, the application specialist evaluates the user herself according to the following questions concerning the comprehension of technical content at the Table 1.

3 RESULTS

A total of 49 doctors participated in the evaluation. 64% of participants are in gynecology and 28% is in radiology department. 56% of participants were male. Various models of three different brands have been used in this study. Demographic and used device distribution is given in Table 2. Result evaluation was performed using SPSS 23.0 software. Results were compared with Pearson Chi Square and Fisher Exact Test. P values below 0.05 were considered statistically significant.

Accordingly, almost half of the users use device A as shown in Figure 1. It was observed that there was no statistically significant difference between expertise areas of physicians, when the distribution of physicians according to specialty is examined (p<0.05 for all question). As seen in Figure 2, it was determined that there was a significant difference between the answers given to the eighth (p<0.032) and ninth (p<0.039) questions, when the results are analyzed according to device brand.

When the evaluation results are analyzed according to physician's gender, there was a statistically significant difference between the answers given to all questions except for ninth and eleventh questions. The statistical significance values of results (p) are shown in Table 2.