

Brief Report

DOI: 10.22114/ajem.v0i0.131

Minimum Number of Required Sessions for Attaining Basic Skills in Laparoscopic Surgery by General Surgery Residents; an Experimental Report

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Published online: 2019-02-20

Abstract

Introduction: Training is the primary route of attaining required skills among residents in general surgery.**Objective:** This study was conducted to evaluate the minimum number of required sessions for attaining basic skills in laparoscopic surgery in a skill-lab among surgical residents.**Method:** This cross-sectional study was conducted in Imam-Khomeini Hospital during 2012. A total of 20 surgical residents were enrolled. There were 45–60 mins sessions weekly, which included the following seven elementary skills: first knot tie, second knot tie, peg exchange, peg drop, rope pass, needle pass, and paper cut. These skills were evaluated weekly, and qualitative evaluations were done every 2 weeks.**Results:** Mean age of the 20 surgical residents was 32.2 ± 4.7 years, and 55.6% of them were males. The median session counts were as follows: six sessions for first knot tie, six sessions for second knot tie, three sessions for peg exchange, eight sessions for needle pass, and five sessions for paper cut.**Conclusion:** Based on the obtained results, it may be concluded that relatively five sessions are required for acquiring basic skills in laparoscopic surgery by surgical residents.**Key words:** Laparoscopy; Simulation Training; Virtual Reality Exposure Therapy**Cite this article as:** Noaparast M, Toolabi K, Hghiri A. Minimum Number of Required Sessions for Attaining Basic Skills in Laparoscopic Surgery by General Surgery Residents; an experimental report. *Adv J Emerg Med.* 2019;3(2): e18.

INTRODUCTION

One of the most important factors for increasing the standard of medical care is raising the knowledge and skill level among physicians, especially postgraduate students and residents in different fields. General surgery is an important field that requires attainment of necessary skills. Minimal invasive surgery is a universally accepted method for surgical operations. However, there are some problems in this era after the introduction of laparoscopic surgery in the curriculum of surgical residents (1, 2). Although training for new surgical methods such as laparoscopy is necessary, some problems have arisen after the inclusion of this field among the required training courses. Equilibrium between training of residents and reduction of harm to patients and developing better care services are required. For this purpose, attempts are being made to introduce the laparoscopic skill lab and demonstrate its effects on training quality. Its effect on the improvement of technical skills among residents before clinical operations has been approved; and undoubtedly, it is necessary. It has been established that repeated attempts of surgical techniques in the skill lab

would increase the performance rapidity and decrease the required time (2). However, previous studies have reported few sessions for preparing the residents for surgery in the operative room, but there is no study about the required frequency of sessions. If this count is not sufficient, the required skills would not be attained by residents and the goal of skill acquisition and improved performance would not be achieved. On the other hand, having sessions more than the required count would lead to increased costs and create a negative attitude about this method of training (3, 4). With regard to the interpersonal differences among residents, it appears necessary to determine the frequency of required sessions for developing the skills among residents. Accordingly, in this study, the minimal number of required sessions for attaining basic skills in laparoscopic surgery in the skill lab was evaluated among surgical residents.

METHODS

Study design and participants

This cross-sectional study enrolled 20 residents of general surgery from three academic tertiary

health care centers in Tehran, Iran, during 2012. Subjects with irregular presence in sessions and those who were unsatisfied for incorporation in the study were excluded.

Intervention and data collection

Data collection was performed using a prepared checklist involving seven skills and categorical performance among subjects. In this study, there were 45–60 mins of sessions weekly. The seven elementary skills were first knot tie, second knot tie, peg exchange, peg drop, rope pass, needle pass, and paper cut. These skills were evaluated weekly, and qualitative evaluations were performed every 2 weeks. Two residents were excluded due to irregular performance. The reference times for comparison were as follows: first knot tie (40 s), second knot tie (32 s), peg exchange (60 s), peg drop (70 s), rope pass (54 s), needle pass (31 s), and paper cut (66 s). These reference times were the average times recorded by attending masters of general surgery in the academic centers.

Statistical analysis

Data analysis was performed using the SPSS (version 13.0) software ([Statistical Procedures for Social Sciences; Chicago, Illinois, USA]). The median was used to determine the minimum number of required sessions for each item, including the actual times in it attained by the residents, and the mean was determined with \pm two standard deviations (SDs). The Pearson correlation and independent-sample t-tests were used.

RESULTS

The mean (SD) age of the subjects was 32.2 (4.7) years; 55.6% of them were males, and 44.4% were females. The median acquired sessions were as follows: first knot tie (six sessions), second knot tie (six sessions), peg exchange (three sessions), peg drop (five sessions), rope pass (six sessions), needle pass (eight sessions), and paper cut (five sessions). For qualitative performance, five sessions were required. A total of 50% of the subjects were able to attain the optimal result in

these counts (Table 1). Age and sex were not related to session counts ($P > .05$).

DISCUSSION

In this study, the minimum number of required sessions for attaining elementary skills in laparoscopic surgery by medical students was as follows: first knot tie (six sessions), second knot tie (six sessions), peg exchange (three sessions), peg drop (five sessions), rope pass (six sessions), needle pass (eight sessions), and paper cut (five sessions). Five sessions were required for qualitative performance. Black et al. demonstrated that 10 sessions were required to obtain the basic skills (5); whereas it was between three and eight sessions in our study.

Mahmoud et al. reported the lab dry as the best training setting compared with video-play and clinical surgery in the operation room (6). However, we evaluated only the skill lab and obtained good results. Franzeck et al. reported the importance of initial skill acquisition in skill labs for better performance in clinical settings; thus, their study further emphasizes the importance of our study for determining the required number of sessions for such skill acquisition (7). Zagouri et al.⁸ mentioned verbal cognition as the initial learning phase. Their study among first- and second-degree students demonstrated the significance of training in skill labs for better performance (8). Furthermore, Giannotti et al. described Nintendo Wii technique as a good training tool for increasing the performance level of residents, even with one session (9).

Adams et al. reported that video games would decrease stress among residents and would also decrease the minimum number of required sessions to six (10); however, it was five sessions in our study. Stefanidis et al. reported a lack of possibility of determining the time interval between sessions (11). However, we used weekly sessions to decrease the devastating programs. The goal of training surgical residents about the

Table 1: Mean, median, and lower and upper bounds for sessions

Item	Mean	Median	Standard Deviation	Confidence Interval for Mean	
				Lower 95%	Upper 95%
First Knot Tie	5.9	6.0	1.3	5.2	6.5
Second Knot Tie	5.9	6.0	1.9	5.0	6.9
Peg Exchange	3.2	3.0	1.8	2.3	4.1
Peg Drop	5.4	4.9	3.9	3.4	7.3
Rope Pass	6.9	6.0	3.3	5.3	8.6
Needle Pass	8.2	8.0	1.9	7.2	9.2
Paper	5.3	5.0	2.7	3.9	6.7
Autonomous Performance	4.8	5.0	1.5	4.0	5.5

methods of laparoscopic surgery should be to increase the coordination of hands and visual systems to obtain better results. In addition, an increase in the capabilities of residents and their self-esteem for laparoscopic surgeries should be concomitant to the elementary and final skills acquired (12, 13).

A higher training skill level of the masters would result in better skill acquisition and higher self-esteem and better results (14). It would also decrease the required number of sessions, as may be observed in the study conducted by Lee et al. that reported minimally six required sessions (15). Nevertheless, some studies such as that by Griffin et al. reported minimally four required sessions (16). All these studies demonstrate the importance of the level of masters' knowledge.

CONCLUSIONS

based on the results obtained in this study, it may be concluded that relatively five sessions are required for acquiring the basic skills in

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laparoscopic surgery by surgical residents. However, further studies must be conducted to obtain more definite and detailed results.

ACKNOWLEDGEMENTS

The authors gratefully acknowledge the cooperation of all surgery residents, which participated in this study.

AUTHORS' CONTRIBUTION

All the authors meet the standard authorship criteria according to the recommendations of international committee of medical journal editors.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

FUNDING

None.

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