

## Effect of Surgical Training Course on Performance of Minor Surgical Procedures in Family Medicine Physicians' Offices: an Observational Study

Rudika Gmajnić<sup>1</sup>, Sanda Pribić<sup>1</sup>, Anita Lukić<sup>2</sup>, Barbara Ebling<sup>1</sup>, Nikola Čupić<sup>1</sup>, Ivana Marković<sup>1</sup>

<sup>1</sup>Department of Family Medicine, Osijek University School of Medicine, Osijek, Croatia

<sup>2</sup>Emergency Medicine Unit, Varaždin Medical Centre, Varaždin, Croatia

**Aim** To examine the influence of a practical surgical course on the number of minor surgical procedures performed by family physicians.

**Methods** We compared the number of minor surgical procedures performed by family physicians in 59 offices in the city of Osijek and surrounding rural area during 12 months before and after the 40-hour practical surgical course held in September 2006 by surgeons and family medicine specialists. Minor surgical procedures taught in the course included management of ingrown toenails, abscesses/comedones, and minor wounds, anesthesia application, disinfection, use and sterilization of surgical instruments, and antibiotic treatment.

**Results** The number of minor surgical procedures performed in family medicine offices almost doubled (503 vs 906 after the course,  $P < 0.001$ , Wilcoxon test). The median number of abscesses/comedones treatments per physician increased from 1 to 6 ( $P < 0.001$ , Wilcoxon test), the number of managed wounds increased from 111 to 217 ( $P < 0.001$ , Wilcoxon test), while the number of ingrown toenail resections increased from 120 to 186 ( $P = 0.004$ , Wilcoxon test). Fifty percent of physicians did not treat patients surgically, irrespective of the training. We found no association between the number of performed procedures and age, length of employment, or location of the physician's office (urban vs rural). However, we found that male physicians performed more surgical treatments both before and after the course (abscesses/comedones:  $P < 0.001$  and  $P = 0.108$  respectively; ingrown toenail resections:  $P = 0.008$  and  $P = 0.008$  respectively; minor wounds:  $P = 0.030$  and  $P < 0.001$ ; respectively).

**Conclusion** Practical courses can encourage practitioners to treat the patients surgically in their offices and, thus, increase the number of services offered in primary care. Female physicians should be more encouraged to perform minor surgical procedures in their offices.

> **Correspondence to:**

Anita Lukić  
Health Center Varaždin  
Emergency Medicine Unit  
BB Frana Galinca  
42000 Varaždin, Croatia  
anita.lukic@mef.hr

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Surgical problems are a part of everyday routine of a family physician. Although some of the procedures are usually performed in the office, others, such as surgical treatment of comedones, abscesses, and ingrown toenail, or minor wounds management, are believed to be more complicated (1-3) and these patients are usually referred to a surgeon. In fact, there is no reason for such a practice, because the complexity of these procedures, need for specialist's knowledge and skills, or legal aspects do not exceed family physician's competence and technical and logistical support (4-7).

Primary health care practitioners, such as family physicians, should be encouraged to offer broader range of medical services in their every day work, including surgical ones (3,7-10). However, to do so, they should be not only properly equipped, but adequately trained as well.

As a lack of time or practical experience (11) and inadequate training (12) are frequently cited as reasons for not performing minor surgical procedures in family medicine offices, an obvious solution would be to include more practical surgical workshops in the program of continuous medical education of family physicians. To confirm this hypothesis, we explored the influence of a course in practical surgery on the number of minor surgical procedures performed in family medicine offices, expecting to detect a significant increase.

## **Methods**

### ***Participants and data collection***

We included 25 family physicians from the city of Osijek, Croatia, and 34 family physicians from the rural area around Osijek. Data on minor surgical procedures performed during 12 months before and 12 months after the course were collected from daily reports of every practitioner included in the study.

We monitored the total number of the following minor surgical procedures: comedones and abscesses treatment, ingrown toenail resections, and minor wounds management.

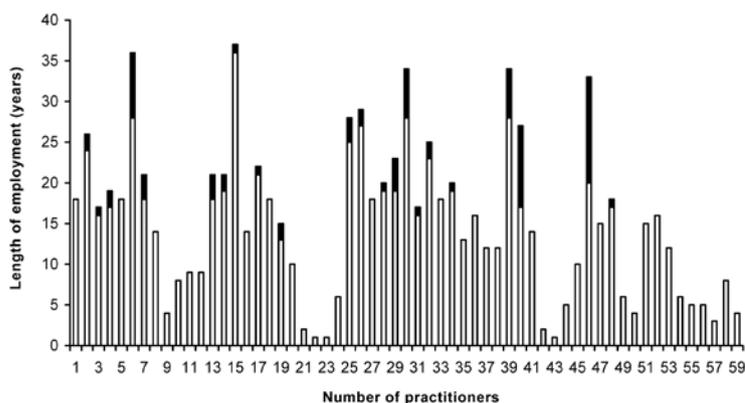
### ***Surgical practical course***

The continuous medical education course was organized in September 2006 by the University of Osijek, School of Medicine, Croatia, and was led by a team of family medicine specialists and surgeons. It consisted of 20 hours of theoretical education and 20 hours of practical work on models and was structured according to the requirements of the Croatian Medical Chamber. The management of minor surgical wounds, preanesthetic preparation, disinfection basics, surgical instruments, and sterilization of surgical instruments were instructed by a surgeon. A family medicine specialist explained legal aspects and regulations regarding minor surgical procedures in family medicine office, as well as antibiotic therapy, cleaning and dressing wounds, and wound healing control in general. Participants practiced surgical treatment of abscesses/comedones, resection of ingrown toenails, and small wound management on models, under the guidance and supervision of surgeons and family medicine specialists.

At the end of the course, there was a test of theoretical knowledge and practical skills. Participants who successfully completed the course were awarded a set of surgical instruments.

### ***Statistical analysis***

The normality of variable distribution was tested by Kolmogorov-Smirnov test and the values are presented as median with quartile range (QR). The number of surgical treatments before and after the course was compared by Wilcoxon test for paired samples, whereas the comparisons within the same time point and the comparison of the total



**Figure 1.** Total length of employment compared with the length of employment as family physicians of 59 family physicians enrolled in the study on the number of minor surgical procedures performed in their offices before and after the surgical practical course on minor surgical procedures in family practitioner's office. The 40-hour mixed theoretical/practical course was organized as a part of continuous medical education of medical doctors according to the requirements of the Croatian Medical Chamber.

length of employment with the length of employment in family practice were performed using Mann-Whitney test. The association between the number of treatments and age or length of employment was analyzed by rank correlation test. The statistical analyses were performed using MedCalc software, version 9.5.1.0 (MedCalc Software, Mariakerke, Belgium), with a significance level set at  $P < 0.05$ .

## Results

### Demographic data

Of 59 enrolled practitioners, there were 23 men and 36 women ( $P = 0.118$ ;  $\chi^2$  test), aged

between 28 and 63 years (median, 42 years). When we compared the total length of their employment (median [range], 15 [1-36] years) and the length of their employment as family physicians (14 [1-14 years]), we found that most of them worked as family physicians for most of their career ( $P = 0.380$ ) (Figure 1).

### Minor surgical procedures performed by family physicians

**Abscesses/comedones treatment.** Only 30 family physicians (51%) provided the surgical treatment of abscesses/comedones before the course, performing a total of 272 procedures (median [QR], 1.0 [6.0]) (Table 1). After the course, the median of total number of the procedures raised to 6.0 (QR, 9.0) (Wilcoxon's test,  $P < 0.001$  vs before the course), while 38 (64%) physicians performed more treatments than before (Table 2).

**Ingrown toenail resections.** Before the course, 120 ingrown toenail resections were performed (median per physician [QR], 0 [4.0]), compared with 186 after the course (0 [QR, 9.0];  $P = 0.004$  vs before the course) (Table 1). Before the course, 40 physicians (68%) did not perform ingrown toenail resections. Although the same 40 physicians still did not perform surgical procedures after the course, an increase in the number of

**Table 1.** Number of minor surgical procedures performed in 59 family medicine offices in Osijek and surrounding rural area, before and after the course in minor surgical procedures for family physicians\*

| Characteristic          | No. of physicians performing the procedures (median procedure per physician, quartile range) |            |             |                 |           |             |                        |           |             |
|-------------------------|--|------------|-------------|-----------------|-----------|-------------|------------------------|-----------|-------------|
|                         | comedones/abscess treatment  |            |             | nail resections |           |             | minor wound management |           |             |
|                         | before   | after      | $P^\dagger$ | before          | after     | $P^\dagger$ | before                 | after     | $P^\dagger$ |
| Office location:        |  |            |             |                 |           |             |                        |           |             |
| urban                   | 110 (0,6)  | 173 (5,8)  | 0.007       | 44 (0,0)        | 53 (0,3)  | 0.375       | 35 (0,0)               | 84 (2,5)  | 0.002       |
| rural                   | 162 (2,6)  | 330 (7,8)  | <0.001      | 76 (0,0)        | 133 (0,4) | 0.001       | 76 (0,2)               | 133 (0,4) | 0.033       |
| $P^\ddagger$            | 0.498  | 0.156      |             | 0.510           | 0.560     |             | 0.403                  | 0.586     |             |
| Sex:                    |  |            |             |                 |           |             |                        |           |             |
| male                    | 111 (5,12)   | 268 (6,17) | 0.119       | 115 (0,6)       | 151(4,8)  | 0.043       | 96 (0,5)               | 163 (5,6) | 0.006       |
| female                  | 61 (0,2)   | 235 (6,6)  | <0.001      | 5 (0,0)         | 35 (0,0)  | 0.031       | 15 (0,0)               | 54 (0,2)  | 0.002       |
| $P^\ddagger$            | <0.001   | 0.108      |             | 0.008           | 0.008     |             | 0.030                  | <0.001    |             |
| Total No. of procedures | 272 (1,6)  | 503 (6,9)  | <0.001      | 120 (0,0)       | 186 (0,4) | 0.004       | 111 (0,1)              | 217 (0,5) | <0.001      |

\*The 40-h mixed theoretical/practical course was organized as a part of continuous medical education of physicians according to the requirements of the Croatian Medical Chamber.

†Wilcoxon's test.

‡Mann-Whitney's test.

**Table 2.** Number of family physicians (N=59) performing minor surgical procedures in family medicine offices in Osijek and its surroundings after the course in minor surgery procedures.\*

| No. of physicians                 | No. (%)                     |                 |                         |
|-----------------------------------|-----------------------------|-----------------|-------------------------|
|                                   | comedone/abscess treatments | nail resections | minor wound managements |
| Performing a procedure:           |                             |                 |                         |
| decreased                         | 8 (13.6)                    | 2 (3.4)         | 3 (5.1)                 |
| did not change                    | 5 (8.5)                     | 1 (1.7)         | 2 (3.4)                 |
| increased                         | 38 (64.3)                   | 16 (27.1)       | 23 (38.0)               |
| Not performing a procedure at all | 8 (13.6)                    | 40 (67.8)       | 31 (52.5)               |

\*The 40-h mixed theoretical/practical course was organized as a part of continuous medical education of physicians according to the requirements of the Croatian Medical Chamber.

performed ingrown toenail resections was recorded in 16 (27%) physicians (Table 2).

**Minor wounds management.** About half of the physicians (n=31; 53%) decided not to perform minor wounds management at all (Table 2). However, the total number of procedures increased after the course from 111 to 217 ( $P<0.001$ ). In addition, the number of treatments per physician also increased significantly (before the course: median [QR], 0.0 [1.0]; after the course: 0.0 [QR, 5.0];  $P<0.001$ ).

Out of 59 enrolled physicians, 29 did not perform any of the minor surgical procedures either before or after the course.

#### **Minor surgical procedures according to family medicine office location**

Irrespective of the course attendance, the number of minor surgical procedures did not differ between the physicians working in the rural area and those working in the city (Table 1). Also, in both the physicians working in the rural area and in those working in the city, there was a significant increase in the number of abscesses/comedones treatments (by 36% in the city and 51% in the rural area) and minor wound managements (by 58% in the city and 43% in the rural area) (Table 1). The number of ingrown toenail resections remained almost the same in the city (44% vs 53%), while it increased in the rural area by 51% (Table 1).

#### **Minor surgical procedures according to practitioner's length of employment, age, and sex**

The number of performed abscesses/comedones, ingrown toenail, and minor wounds treatments was not associated with the family physician's age or length of employment (data not shown).

Male participants generally performed significantly more minor surgical procedures than did female participants, both before and after the course (Table 1). The only exceptions were abscesses/comedones treatments after the course, where female physicians performed about the same number of procedures as their male colleagues (median [QR], 6 [17] for men vs 6 [6] for women).

#### **Discussion**

There was a significant difference in the number of minor surgical procedures before and after the course. Family physicians felt more confident to treat comedones and abscesses in their offices, as well as minor surgical wounds (increase by 64% and 39%, respectively) after the course. Although we found more ingrown toenail resections (increase by 27%), almost two-thirds of the physicians did not treat ingrown toenails in their offices, either before or after the course. The lack of surgical instruments cannot be the explanation for this, since after the course, all the practitioners were given a surgical set that included the instruments required for performing minor surgical procedures. However, a lack of motivation could explain the low number of treatments.

We also showed that urban or rural location of the office was not associated with the number of the procedures, irrespective of the course. This suggests that, when minor surgical procedures in primary practice are concerned, both urban and rural population receive similar level of medical care. At the same time,

contrary to our expectations, younger and less experienced physicians were equally willing and prepared to perform minor surgical treatments in their offices as their older colleagues. However, there was a significant difference between male and female physicians. Since today there is a prevalence of female medical students (13-15), these results are rather worrying. However, it is encouraging that female physicians performed significantly more procedures after the course, but their level of self-confidence to provide this sort of medical care is still questionable. These results show that we need to show to female physicians that minor surgical procedures are not too complicated to perform in the family medicine offices and that they are capable of doing them. The fact that almost half of the physicians did not perform any of the minor surgical procedures before or after the course indicates an urgent need for education and motivation of family physicians, but also the education of their patients who need to be assured that certain procedures can successfully be performed in family medicine offices.

This study has two serious limitations. First, we did not have a control group (eg, family medicine practitioners who attended some other course, on electrocardiogram). Therefore, we cannot exclude the possibility that the performance was improved because of some other factor apart from the training. Second, we had a relatively small sample, so a larger study is needed if any definite conclusions are to be drawn.

In the line with previous reports (16-18), this study showed that practical course-based learning and training in appropriate techniques and tools in the presence of a mentor was a valuable and irreplaceable part of education, especially in surgical procedures (19). Of course, constant upgrading and persistent use of skills is important for their proper use (20,21). Our study also suggests that, by rela-

tively small interventions in the education and training of family physicians, such as this practical course, it is possible to achieve improvements in primary health care and reduce the pressure on secondary and tertiary health care institutions. Thus, the introduction of well-designed and task-focused practical trainings into the existing scheme of continuous medical education could effectively increase the level of competence of physicians in primary medical care and significantly benefit the entire health care system.

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