



ORIGINAL ARTICLE

Medical errors and uncertainty in primary healthcare: A comparative study of coping strategies among young and experienced GPs

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Abstract

Objective. To study coping differences between young and experienced GPs in primary care who experience medical errors and uncertainty. **Design.** Questionnaire-based survey (self-assessment) conducted in 2011. **Setting.** Finnish primary practice offices in Southern Finland. **Subjects.** Finnish GPs engaged in primary health care from two different respondent groups: young (working experience ≤ 5 years, $n = 85$) and experienced (working experience > 5 years, $n = 80$). **Main outcome measures.** Outcome measures included experiences and attitudes expressed by the included participants towards medical errors and tolerance of uncertainty, their coping strategies, and factors that may influence (positively or negatively) sources of errors. **Results.** In total, 165/244 GPs responded (response rate: 68%). Young GPs expressed significantly more often fear of committing a medical error (70.2% vs. 48.1%, $p = 0.004$) and admitted more often than experienced GPs that they had committed a medical error during the past year (83.5% vs. 68.8%, $p = 0.026$). Young GPs were less prone to apologize to a patient for an error (44.7% vs. 65.0%, $p = 0.009$) and found, more often than their more experienced colleagues, on-site consultations and electronic databases useful for avoiding mistakes. **Conclusion.** Experienced GPs seem to better tolerate uncertainty and also seem to fear medical errors less than their young colleagues. Young and more experienced GPs use different coping strategies for dealing with medical errors. **Implications.** When GPs become more experienced, they seem to get better at coping with medical errors. Means to support these skills should be studied in future research.

Key Words: Coping, Finland, general practice, GPs, medical error, primary care, uncertainty

Introduction

Medical errors and patient safety are important concerns for physicians, especially for those working in primary health care as the working environment is often busy, the variation in patients' symptoms and diseases is extensive, and the GPs are easily distracted by various interruptions [1]. Sandars and Esmail found in their review of several studies in primary care that the definition of a medical error was inconsistent and the medical error rates varied greatly [2]. The most important were errors relating to diagnosis, extending from 26% to 78% of all errors identified [2]. However, Hoffman et al. argued that 72.9% of errors reported by primary care physicians were process errors, i.e. errors related to the processing of

a patient through the health care system, such as choosing the wrong treatment, or failure in communication, for example misunderstandings [3]. They suspected a bias towards reporting only most serious events [3].

Sandars and Esmail noted that a tired physician or a physician with a very busy schedule was a risk factor for errors, as 10% of the errors were caused by either [2]. Among young physicians fatigue and distress have been associated with committing medical errors [4]. Berner and Graber found that overconfidence is a risk factor for a diagnostic error [5]. Atypical presentations of a disease as well as certain medical conditions, such as breast cancer, dementia, and myocardial infarction, have been associated with

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- Little is known about the differences between young and more experienced GPs and how these two groups see and cope with medical errors and uncertainty in medical decisions.
- Young and more experienced GPs seem to cope in different ways with medical errors, which may suggest a generation gap.
- More often than their younger colleagues, experienced GPs find that disturbances during face-to-face consultation with a patient might predispose to medical errors.
- Experienced GPs seem to better tolerate uncertainty in medical decision-making than their younger colleagues.

diagnostic error or delay in primary care [6]. There are contradictory findings on how interruptions and distractions in consultations affect physicians' performance, i.e. when the doctor is completing a patient-related task at hand [1,7,8].

McIntyre and Popper stated in their article from 1983 that in historical time physicians as authorities were not expected to make mistakes [9]. Therefore, it was better to hide mistakes rather than report them to others [9]. According to Kaldjian et al. physicians still share a certain dilemma regarding mistakes [10]. Physicians have a desire to learn from them and to share those lessons with their peers. However, it is difficult as there is always a risk of loss of reputation, as well as disciplinary actions and embarrassment [11]. Older physicians may prefer to suffer alone, pondering over the negative effects possible disclosure could have on their relationships with patients, their careers, and self-confidence [12]. Some studies have suggested that physicians are unsure where to seek emotional support when errors occur, and they are worried that disclosing errors to patients might damage their reputation, as well as being awkward and uncomfortable [11]. Patients, however, wished to be told about any error that had caused them harm [11].

It has been stressed that residents, i.e. young physicians, will benefit most from learning opportunities, where they can discuss medical errors with their peers and supervisors [13,14].

In our previous study we found out that students in the fifth year of medical school tolerating uncertainty poorly were significantly more often afraid of making mistakes than those tolerating uncertainty well [15]. Less has been written on the topic of how physicians cope with the fear of making mistakes, and the possible differences in coping strategies, when it comes to age and several years of experience.

The aim of this study was to compare experiences of uncertainty and medical errors between younger and experienced GPs in primary healthcare. Specifically, we explored how the fear of committing medical errors is associated with the GPs' extent of experience and how many they actually commit, and how they cope with medical errors. We use the terms "mistake" and "error" throughout the text.

Material and methods

A questionnaire-based survey was sent to a convenience sample of GPs in Southern Finland. Contact GPs from health centres in Southern Finland were invited to participate in the survey and to provide e-mail addresses of their colleagues in their workplace. We received 244 email addresses. During the year 2011, 165/244 (response rate 68 %) persons, both young and more experienced GPs, responded. Reminders were sent to those who had not responded via a second e-mail. The questionnaire was developed by using a few of the questions from our former survey of fifth-year medical students as well as another prior questionnaire developed for the detection of work-related exhaustion among physicians [15,16]. Our questionnaire was responded to anonymously.

In this report, we limit the topic to committing medical errors and questions related to this in the survey. We did not define the concept of medical errors in order to enable the participants to associate freely regarding their experiences. This choice was intentional as a strict definition might have hampered the GPs' responses.

The questionnaire included demographic variables (Table I). It also inquired about the participants' views on tolerance of uncertainty, making mistakes, and which factors predispose them to mistakes or influence their ability to avoid mistakes. We have decided to present participants divided by years of working experience, the cut-off point being five years of working experience, hence the group of younger GPs had five years or less, the experienced GPs had more than five years.

The item concerning tolerance of uncertainty was phrased as: "I have difficulties in tolerating uncertainty in diagnostics and/or medical decision making"; "I tolerate uncertainty quite well in diagnostics and/or medical decision making"; "I tolerate uncertainty very well in diagnostics and/or medical decision making". The item about fear of making mistakes was phrased as follows: "Are you afraid of making a mistake working as a GP?" (possible responses: Yes/No/I have not thought about it more specifically).

The questions used on mistakes were phrased as follows: "(1) Have you committed a medical error in

Table I. Background information on the participants.

	GPs with ≤ 5 years of working experience (n = 85)	GPs with > 5 years of working experience (n = 80)	p-value
Age, mean (SD)	31.2 (4.8)	48.4 (7.7)	< 0.001
Males, % (n)	22.4 (19)	27.8 (22)	0.42
Married/living in a marriage-like relationship, % (n)	77.6 (66)	87.3 (69)	0.10
Recently graduated physician/not intending to specialize in general practice, % (n)	48.8 (42)	7.8 (13)	< 0.001
Specializing in general practice, % (n)	50.6 (43)	20.0 (16)	< 0.001
Specialist in general practice, % (n)	0 (0)	61.3 (49)	< 0.001

Notes: Difference between the groups in categorical variables was tested with a chi-squared test. In Finland, it takes five years to become a specialist in general practice.

patient-related work during the past year?" (Yes/no). "(2) What did you do when you committed a medical error in your work?" Several options could be chosen: "I tried to hide it" (yes/no); "I told my supervisor or a colleague about it" (yes/no); "I told the patient and gave an explanation" (yes/no); "I told the patient and apologized" (yes/no); "I tried to search for a cause in my work community" (yes/no).

The participants were also asked which factors in work predispose to committing a medical error and which factors help to avoid them (Table II).

In statistical analysis, the variables are presented as means with standard deviations or as percentages. The comparisons between categorical variables are made with a chi-squared test or Fisher's exact test, and between the non-normally distributed continuous variables with the Mann-Whitney U-test. P-values < 0.05 are considered significant; 95% confidence intervals were calculated for the main results.

Results

Uncertainty and fear of medical errors

The mean age of the respondents was 31.2 years for the young GPs with less than five years of working

experience, and 48.4 years for the experienced GPs with more than five years of working experience. The experienced GPs tolerated uncertainty better. Among these, 53.8% (95% Confidence Interval (CI) 42.2–65.0) tolerated uncertainty well, whereas among the younger GPs the figure was 25.9% (95% CI 17.0–36.5) ($p < 0.001$). Among the experienced GPs, only 1.3% (95% CI 0.0–6.8) tolerated uncertainty poorly whereas the respective figure for young GPs was 5.9% (95% CI 1.9–13.2) ($p = 0.11$). Over 80% of all of the primary care physicians had sometimes thought about the possibility of a patient complaint, an accusation, or a lawsuit. There were no differences between the groups. The young GPs significantly more often experienced fear of medical errors (70.2% vs. 48.1%) ($p = 0.004$) (see Table I).

A larger proportion of young GPs (83.5%, 95% CI 73.9–90.7) than experienced GPs (68.8%, 95% CI 57.4 to 78.7) had also committed a medical error during the past year ($p = 0.026$) (see Table I).

Coping with medical errors

The young GPs were more prone to tell their supervisors or a colleague about an actual medical error than the experienced GPs (72.2% (95% CI 62.2–82.0) vs.

Table II. Uncertainty and fear of medical errors.

	GPs with ≤ 5 years of working experience (n = 85)	GPs with > 5 years of working experience (n = 80)	p-value
Tolerating uncertainty well, % (95% CI)	25.9 (17.0–36.5)	53.8 (42.2–65.0)	< 0.001
Tolerating uncertainty quite well, % (95% CI)	68.2 (57.2–77.9)	45.0 (33.8–56.5)	< 0.003
Tolerating uncertainty poorly, % (95% CI)	5.9 (1.9–13.2)	1.3 (0.0–6.8)	0.11
Fear of committing a medical error, % (95% CI)	70.2 (59.3–79.7)	48.1 (36.7–59.6)	0.004
Has sometimes thought about the possibility of a patient complaint, an accusation, or a lawsuit, % (95% CI)	82.4 (72.6–89.8)	81.2 (71.0–89.1)	0.85
Has committed a medical error during the past year, % (95% CI)	83.5 (73.9–90.7)	68.8 (57.4–78.7)	0.026

Notes: Difference between the groups in categorical variables was tested with a chi-squared test. (95% CI) = 95% confidence interval for the differences between the groups.

Table III. Responses to the question on what the GPs have done when they have made a medical error.

Variable	GPs with ≤ 5 years of working experience (n = 85)	GPs with > 5 years of working experience (n = 80)	p-value
Has tried to hide an error, % (95% CI)	4.7 (1.3–11.6)	5.0 (1.4–12.3)	0.93
Has told the supervisor/a colleague, % (95% CI)	72.2 (62.2–82.0)	56.3 (44.7–67.3)	0.025
Has told the patient and explained, % (95% CI)	61.2 (50.0–71.6)	68.8 (57.4–78.7)	0.31
Has told the patient and apologized, % (95% CI)	44.7 (33.9–55.9)	65.0 (53.5–75.3)	0.009
Has tried to search for an explanation in the working community, % (95% CI)	2.4 (0.3–8.3)	5.0 (1.4–12.3)	0.36

Notes: Difference between the groups in the categorical variables was tested with a chi-squared test. (95% CI) = 95% confidence interval for the differences between the groups.

56.3%, (95% CI 44.7–67.3) ($p = 0.025$)). The experienced GPs were more prone to apologize to the patient about a medical error (65.0% (95% CI 53.5–75.3) vs. 44.7% (95% CI 33.9–55.9) ($p = 0.009$)). About 5% in both groups admitted that they had tried to hide an error (Table III).

Means to avoid medical errors

There were some significant differences between the groups when asked about which factors predisposed to mistakes or helped to avoid them. The experienced GPs felt more often than the young GPs that nurses' and colleagues' consultations were a disturbing factor while seeing a patient (56.3% (95% CI 44.7–67.3) vs. 36.5% (95% CI 26.3–47.6), ($p = 0.011$)) (Table IV). There were no other significant differences between the groups related to factors predisposing to medical errors.

The young GPs found electronic databases more useful than the experienced GPs (100% (95% CI 95.8–100.0) vs. 93.7 (95% CI 85.8–97.9), ($p = 0.018$)) (see Table IV).

Discussion

Medical errors seem to happen frequently in primary care since 76% of the GPs in our study admitted to having committed a medical error during the past year. The young GPs stated more often than the experienced GPs that they had committed a medical error during the past year in this study. There were also differences in coping strategies between these groups: the experienced GPs admitted apologizing to the patient more often than their younger colleagues, whereas the young GPs were more prone to tell their supervisor or a colleague about a mistake than the experienced GPs. The young GPs more frequently favoured consultations on-site and electronic databases when trying to avoid mistakes compared with the experienced GPs. The experienced GPs felt more often than their younger colleagues that nurses' and colleagues' consultations during a patient appointment were a risk for committing a medical error.

The strength of this study is that the survey was sent to primary care physicians, both young and experienced, as the majority of prior research on this topic has been performed in hospital environments

Table IV. Making mistakes at work, and means used to avoid mistakes according to physicians working in primary care.

	GPs with ≤ 5 years of working experience (n = 85)	GPs with > 5 years of working experience (n = 80)	p-value
Factors that may predispose to making mistakes			
Consultations from nurses or colleagues (while seeing a patient), % (CI)	36.5 (26.3–47.6)	56.3 (44.7–67.3)	0.011
Telephone calls (while seeing a patient), % (CI)	50.6 (39.5–61.6)	55.0 (43.5–66.2)	0.57
Stressing time-schedule, % (CI)	92.2 (85.3–97.4)	87.5 (78.2–93.8)	0.24
Demanding patient, % (CI)	47.1 (36.1–58.2)	40.0 (29.2–51.6)	0.36
A relative has joined the patient at the surgery, % (CI)	9.4 (4.2–17.7)	8.8 (3.6–17.2)	0.88
Means used to avoid mistakes that help to some extent or a lot			
Consultations among colleagues at the workplace, % (CI)	94.1 (86.8–98.1)	83.6 (73.5–90.9)	0.30
Consulting a hospital specialist, % (CI)	96.4 (90.0–99.3)	88.6 (79.5–94.7)	0.053
Updating education and/or medical literature and journals, % (CI)	81.2 (71.2–88.8)	82.3 (72.1–90.0)	0.86
Electronic databases, % (CI)	100 (95.8–100.0)	93.7 (85.8–97.9)	0.018
Clinical experience, % (CI)	97.7 (91.8–99.7)	100 (95.4–100.0)	0.17

Notes: Difference between the groups in the categorical variables was tested with a chi-squared test. (95% CI) = 95% confidence interval for the differences between the groups.

[12,14,16–18]. An additional strength of our study is the relatively good response rate, as it adds to the representativeness of our results. We used a convenience sample and conducted the survey via our contact GPs in primary care in order to make sure that this survey would reach those who actually work in these health centres. The limitation of our study is the fairly small sample size compared with the hospital-based studies. However, to our knowledge, there are very few prior studies exploring this topic in primary care [2,20]. Another limitation is the self-perceived nature of medical error by the respondents, as our study is based on the experiences of physicians working in primary care, which errors they considered to be significant, and their willingness to report them [4]. Relying on memory and willingness to remember may underestimate the true prevalence of medical errors. In addition, primary care settings differ in different countries. Therefore, the findings of our study are not directly applicable to other countries.

Sandars et al. stated in their review that medical errors occur 5–80 times per 100 000 consultations in primary care [2]. However, it is extremely difficult to compare the prevalence rates since the definitions and methods of detecting errors have varied from study to study. In our study, 84% of the young GPs and 69% of the more experienced GPs admitted having committed a medical error during the last year. Wu et al. (1991) surveyed 254 house officers regarding their most significant mistake, of whom 45% reported having made a mistake [21]. In a survey among resident physicians in the US, 34% of participants had made at least one major medical error [15]. The difference in these findings compared with ours may reflect a different definition and timescale of errors as in our study the participants could include all possible errors in their figures.

Physicians are, however, reluctant to disclose their errors to patients. In our study, 55% of the GPs had spoken about a mistake to their patient. This figure is higher than in the study by Kaldjian et al. in which only 41% of the physicians actually spoke about a minor error to a patient [16]. In our study, 72.9% of the young and 56.3% of the experienced GPs had spoken about a mistake to either their supervisor or a colleague. This is consistent with prior studies in which 57–88% of young physicians had discussed their mistakes with their colleagues [12,14]. Training young physicians to discuss their errors has been emphasized [17–19]. A specific model to enhance error disclosure has also been developed [13]. Crook et al. stated that the ability to disclose errors is highly dependent on the level of maturity of a physician, and many younger physicians need time to develop that

particular skill [22]. Somewhat in line with this finding, in our study the young GPs were more willing to discuss their errors with their colleagues but less willing to apologize to their patients than more experienced GPs (44.7% vs. 65.0%). The proportion willing to apologize is higher than in previous studies in which 21% to 34% of physicians apologized for the situation associated with the mistake [14,23,24]. Cultural differences might possibly be one reason for the different figures.

Factors predisposing to medical errors have been investigated in a few studies [23–26]. The reactions of physicians to interruptions while seeing a patient have been studied by some researchers [7]. In our study both the young and the more experienced GPs did find interruptions somewhat disturbing and the older more so.

We also posed questions in our study on which factors the participants find helpful in avoiding mistakes and the young GPs considered consultations on-site and electronic databases to be more helpful than the experienced GPs.

The greater fear of making mistakes among the young physicians may have several reasons, one of the most important being their lack of experience [14]. It seems that long-term experience in primary care helps GPs to deal with their fears and also helps them to tolerate uncertainty. In our prior study of fifth-year medical students, 90% were afraid of making mistakes and 22% felt they had difficulties in tolerating uncertainty [15]. Uncertainty and fear of making mistakes seem to reduce gradually with accumulating experience, as the young physicians reflect on the two entities and learn how to deal with them.

Conclusions

Young GPs fear and commit medical errors more often than experienced GPs. Experienced GPs tolerate uncertainty better than the young. Young and experienced GPs use different coping strategies with medical errors. Young GPs tend more often to speak about their medical errors to other colleagues whereas experienced GPs more often apologize to their patient.

Further research is needed to effectively support and ameliorate the developmental process of young and even experienced GPs related to dealing with mistakes and tolerating uncertainty.

Implications

Young GPs may benefit from the possibility to consult on-site, and therefore a good tutoring system

should be developed at every health centre or group practice where young GPs work side by side with more experienced colleagues. It is also important that the horizontal consulting of other colleagues working at the same health centre or group practice is enabled and encouraged, for example by inserting in the time schedules of both experienced and young GPs so-called consultation hours once or twice a week, when the young GPs could come and ask for advice. However, the effectiveness of this approach in preventing medical errors still warrants further study.

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Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the paper.

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