**Medical error and its related factors during internship and residency in Kerman University of Medical Sciences, 2013**

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**Abstract:**

It is difficult to determine the real incidence of medical errors, due to lack of precise definition and failure to report it in some circumstances. This research was a cross sectional study carried out in Kerman University of Medical Sciences, IRAN, 2013. Participants selected through census method. Data collected using a questionnaire containing demographic data and questions about the experience of medical errors. Data analyzed by SPSS 19. Two hundred seventy participants experienced medical errors. There was no significant difference in the frequency of errors between interns and residents. The most common error was misdiagnosis and errors related to history taking and physical examination among residents and interns respectively. Experience of medical error is common in clinical setting. Education systems should enhance the competency of interns and residents to prevent the occurrence of any error as well as development of a positive attitude to help them to deal with medical error.

**Key-words**: clinical setting, internship, medical error, residency

**Introduction:** Medical error considered as the failure of a planned action to be completed as intended. The lack of a precise definition and the fact that all medical errors may not be reported makes it difficult to determine the real incidence1. Medical error has important consequences which are underestimated and consequently without real targeted corrective measures2. Adverse events (AEs) during hospital admission affect nearly one out of ten patients. A substantial part of these events are preventable3. The reported rates of AEs vary remarkably (0.0037-39.0%) because of different definitions, different detection methods and different settings4. Incidence, medical outcome and costs of AEs warrant this issue to be high on any countries health care agenda4.

The Dutch Patient Safety Research Program showed that adverse events (AEs) affect 5.7% of patients in Dutch hospitals and lead to permanent disability, morbidity and even mortality. Forty percent of these AEs were judged preventable by good clinical practice. The estimates of the total preventable direct medical costs of AEs indicate that they form a substantial part (1%) of the expenses of the national health care budget5. Incidence of death in patients with AEs was 4.4%. Age over 65 was associated with a higher incidence of preventable AEs6.

Other factors can cause medical error, include poor communication between physician and patient, misdiagnosis, physicians with less experience, working in extremely busy setting, and in complicated cases1. Aranaz Andre´s and colleagues suggested a knowledge-based culture may be better than a guilt-based culture for preventing AEs. Knowing which types of AEs is avoidable and identifying the predictive factors that are associated with AEs will allow us to develop strategies to improve the safety of health care6. Due to the load of clinical services done by medical interns and residents, their errors can cause harm to patients so our aim was to study the frequency and related factors of medical errors among medical interns and residents in Kerman University of Medical Sciences.

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**Materials and Methods:**

This research was a cross sectional study carried out in Kerman University of Medical Sciences during 2013. All medical interns and residents who were studying in Kerman University of Medical Sciences during 2013 selected through census method. Data were collected using a two section self administered questionnaire .The first section contained demographic data such as age, gender, marital status, duration of studying and educational level(internship and residency) .The second part included questions extracted from the literature review and were about the experience of medical errors, error type (related to history taking , physical examination, diagnostic procedures, treatment, patient education and follow-up care), results of medical errors in patients and reaction to errors among participants(sadness, anger ,depression, fear, increased or decreased willingness to work and forgetting ) .

The validity of the questionnaire was confirmed by a group of experts and its reliability determined using Cranach's alpha 0.8. The questionnaires were completed anonymously. Participants completed it freely .They were assured that the data will be used only for research purposes. Data analyzed by SPSS 19 using chi-square and logistic regression.

**Results:** Two hundred ninety three questionnaires were completed. One hundred thirty (51%) participants were males, 111 (38%) interns, 164 (56%) married. Median age was 25 and 31 years and median time spent in the current level was 6 and 13 months for interns and residents respectively. Two hundred seventy participants (92.5%) stated that they experienced medical errors during current level.

There was no significant difference in the self reported frequency of errors between interns and residents, males and females, married and single participants *(PV>0.05*). Table one shows factors related to medical errors experience using logistic regression model. According to this table only increasing the time spent in the current level increases the likelihood of medical error *(PV = 0.02).*

Among residents the most common error was misdiagnosis (54%), and then error related to treatment (49%), history taking and physical examination (48.5), follow-up care (22%) and patient education (18.34%). Errors related to history taking and physical examination (75.24%) was the most common type among interns follow by misdiagnosis (43.56%), error related to treatment (36.6%), follow-up care (31%) and patient education (13%). There was more than one item selection so; the total is more than one hundred percent.

The most common reaction among residents was sadness (68%), and then increased willingness to work (32%), fear (23.6%), decreased willingness to work (13.5%), forgetting (13%), depression (12%) and anger (5.3%). Depression (73.2%) was the most common reaction among inters then sadness (57.4%), fear (30%), increased willingness to work (30%), decreased willingness to work (12%), forgetting (11%), and anger (2%). Three percent of interns and 1.2 % of residents who experienced medical error stated their errors caused serious, permanent and even life threatening injury for the patient , 20 % of interns and 48 % of residents said their error caused injury but it was not serious and life-threatening and the remaining said their error did not cause any complication for the patient.

**Discussion:** Our study revealed that the frequency of self reported medical errors was high (92.5 %). Kroll et al found that junior doctors commonly make and witness errors, some of which are serious7. In a study in Zabol carried out on general physicians, 72.5 % of them have committed medical error8.

In Mohsenzadeh and colleagues study , the most medical errors was seen among healthcare workers, followed by interns, nurses , general practitioners and specialists9. Our study showed no significant difference in the self reported frequency of errors between interns and residents, males and females and married and single participants. It could possibly indicate that medical errors regardless of gender, marital status and educational level might happen. According to our results increasing the time spent in the current level increases the likelihood of medical error. More contact with patients in addition to causes more experience, on the other hand can also increase the likelihood of error.

Misdiagnosis and errors related to history taking and physical examination were the most common type of error among residents and interns, respectively. More responsibility for the diagnosis and treatment of patients in residents could lead to higher frequency of this type of error among them. Because interns are not directly in contact with patients and work under the supervision of the residents, this type of errors are less likely among them. Khorramabad study found the most common type of medical errors was related to medication orders9.

Despite the high frequency of medical errors, according to our participants report, only a small percentage of them (1.2-3%) stated that their errors caused serious, permanent and even life threatening injury for the patient. In Andrew and colleagues study, 32% of surgical interns and 60%surgical residents stated that their errors caused serious and even life threatening injury for the patient 10. Compared to Andrew study, in our study, the frequency of serious consequences following error was lower. This difference may be because of different setting in two studies. Our study carried out in all clinical departments, but Andrew study reported the consequences of errors in surgery department. In this setting the probability of error is higher and the consequences of error may be more serious.

Juniors deliver a large part of the clinical service in hospitals without proper supervision. They may not recognize signs of deterioration or clinical urgency, so, patients may suffer serious consequences. If they are to gain experience and deliver good patient care, current support and supervision systems must change7. It is education systems responsibility to train medical student about medical errors, how to deal with it and the timely reporting value, but in most medical curricula, there is no training on this issue. Medical error is a common and sensitive issue, because it's related to patients' life and property. A lot of time and money spent on it in the health system. So, education systems should enhance the competency of the students to prevent the occurrence of any error as well as development of a positive attitude to help them to deal with medical error. It's clear that authorities and policy makers have critical role in the Legislation to create a sense of moral and legal security for health care personnel that makes timely disclosure of errors to patients and supervisors.

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**Table 1:** factors related to medical errors experience among medical interns and residents

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| **95% C.I. for EXP(B)** | | **Exp(B)** | **pvalue** | **S.E** | **B** | **Variables** |
| **Lower** | **Upper** |
| 1.34 | 0.84 | 1.07 | 0.31 | 0.12 | 0.65 | age |
| 2.1 | 0.30 | 0.80 | 0.65 | 0.49 | -0.27 | sex |
| 4.39 | 0.19 | 0.92 | 0.92 | 0.79 | -0.77 | level |
| 1.14 | 1.01 | 1.07 | 0.02\*\* | 0.30 | 0.71 | time spent in the current level |

\*\* p value<0.05