

# Disclosure of Medical Errors: Physicians' Knowledge, Attitudes and Practices (KAP) in an Oncology Center

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## Research article

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## Abstract

**Background** Between the need for transparency in healthcare widely promoted by patient's safety campaigns and the fear of negative consequences and malpractice threats, physicians find themselves faced with challenging decisions on whether to disclose medical errors to patients and families or not.

We aim to assess the knowledge, attitudes and practices (KAP) of physicians in our center towards medical error disclosure.

**Methods** This is a cross-sectional self-administered questionnaire study. We piloted the questionnaire and no major modifications were made.

A daylong training workshop consisting of didactic lectures, short and long case scenarios with role-playing and feedback from the instructors were conducted. Physicians who attended the training workshops were invited to complete the questionnaire at the end of the training and physicians who did not attend any training were sent a copy of the questionnaire to their offices to complete. To assure anonymity and transparency of responses, we did not query names or departments.

Descriptive statistics were used to present demographics and KAP. The differences between response\`s of physicians who received the training and those who did not were analyzed with t-test and descriptive statistics. The 0.05 level of significance was used as a cutoff measure for statistical significance.

**Results** Eighty-eight physicians completed the questionnaire (55 attended training (62.50%), and 33 did not (37.50%)). 65.5% of physicians were males and mean years of experience was 16.5 years. 86.9% (n=73) of physicians were more likely to report major harm, compared to minor harm or no harm. Physicians who attended the workshop were more knowledgeable of articles of Jordan's Law on Medical and Health Liability (66.7% vs 45.5%, p-value = 0.017) and the Law was more likely to affect their decision on error disclosure (61.8% vs 36.4%, p-value= 0.024).

**Conclusion** Formal training workshops on disclosing medical errors can positively influence physicians' KAP toward disclosing medical errors to patients and possibly promoting a culture of transparency in the health care system.

## Background

Medical Error disclosure is defined as "communication between a health care provider and a patient, family members, or the patient's proxy that acknowledges the occurrence of an error, discusses what happened, and describes the link between the error and outcomes in a manner that is meaningful to the patient" [1]. Despite the increasing efforts health care institutions and health care workers make to prevent medical errors and adverse events[2], medical errors are still inevitable. In the United States, more than 1 million medical error occurs annually, and the mortality from medical errors is estimated to be about 98,000 deaths/year [3]. In Jordan, a study reported that 28% of all hospital admissions are believed

to be affected by medical errors. Fifty-six percent of participants reported medication errors as the most significant type of adverse events (AEs). This was followed by wrong diagnosis, infections, bedsores and falls reported by 21.3%, 21.3%, 16% and 8% of participants, respectively[4]. Other AEs reported in the study were errors of patient identification, transfusion errors, and medical errors that lead to patients' death.

Disclosure of medical errors is recommended and governed by ethical and professional guidelines and legislations [5, 6], and the acknowledgement of medical errors, even if those errors classify as minor or insignificant, is desired by the overwhelming majority of patients [7, 8]. Furthermore, patients were more inclined to consider the litigation of medical errors if their physician did not disclose them[9], which further reinforces the importance of the physician's acquaintance on how to properly disclose medical errors to their patients[10, 11], including when and where to disclose.

Interestingly, the prevalence of disclosure of medical errors remains fluctuant, as studies found that 50% to 96% of errors in the US are underreported [12, 13]. Nevertheless, physicians still acknowledge disclosure of medical errors as a fundamental part of patients' care [14-17]. They have entrusted their physicians with their health. While trust is the cement that holds the physician-patient relationship, hiding (or lying about) errors cracks that trust and leads to distrust in the medical profession at large. To further emphasize the importance of disclosing errors to patients, there is a need to better understand the elements that interfere with error disclosure [18]. Challenges and barriers of disclosing medical errors are not limited only to the fear of disclosing the event to the patients, but also include the repercussions of discussion with peers such as blame, embarrassment or even loss of reputation [19, 20]. It also includes proper reporting to the institution, and the possibility of legal liability [14, 21-23]

Stemming from the importance of a physician's knowledge and willingness to report medical errors in improving healthcare standards and quality, the King Hussein Cancer Center (KHCC) in collaboration with the Salim El-Hoss Bioethics and Professionalism Program (SHBPP) at the American University of Beirut Faculty of Medicine and Medical Center (AUBMC), conducted several workshops. The aim is to coach physicians at KHCC on how, when and where to effectively disclose medical errors to patients and their families, especially in view of the recently enacted "Medical and Health Liability Law" (MHLL) in Jordan which was published by the government of Jordan and took effect on 31 August 2018 [24]. Article-5 of the MHLL states that physicians and health care workers are required to perform services subject to the requirements of the morals, accuracy, and loyalty of the profession, which must be in line with the established scientific standards. According to the Law, a medical error occurs when physicians are involved in an act or omission, which does not correspond to the standard professional rules resulting in harm to the patient. The aim of the Law is to better govern and regulate the relationship between physicians and patients, especially when medical error is suspected.

The King Hussein Cancer Center is a standalone, and one of the most comprehensive, cancer centers in the Middle East, which treats both adult and pediatric patients. It provides state of the art cancer care for

the citizens of Jordan and many neighboring countries. The center treats over 6,000 new cases and its' outpatient clinics have almost 300,000 encounters annually [25].

Although disclosure of medical errors remains consequential in all fields of medical practice, medical errors have a specialty-sensitive dimensions [26], one example would be when it comes to cancer patients. Cancer care can be complex and integrative; the use of many medications, the tendency for cancer patients to be enrolled in clinical trials, the long follow up period, and the involvement of multidisciplinary teams. The aforementioned factors make it healthcare especially challenging for physicians and may add to the risk of medical errors and to the difficulty of disclosing them to patients [27]. Examples include the pediatric oncology services, which deals with a particular vulnerable group. Disclosing medical errors to pediatric cancer patients is of a particular challenge, as they may especially face diagnostic delays given the nature of disease in pediatric population [28], chemotherapy infusion errors [29], and outpatient adverse events [30]. Given the complexity of error disclosure in cancer patients, ethical professional practice in KHCC is driven by its' six core values of cultural and ethical sensitivity, excellence, compassion, team work, innovation, and person-centered care. Ethical practice is reflected in the various medical and administrative functions of the institution. This includes decision making at the Hospital Ethics Committee [31] for dealing with ethical issues that arises when delivering the standard of care procedures, to the review of human subject research at the Institutional Review Board [32] to ensure only ethically sound research is conducted at the center.

The aim of this cross-sectional study is to assess the knowledge, attitudes and practices (KAP) of physicians at KHCC towards error disclosure in addition to the effect of the formal training workshops on physicians' KAP.

## Methods

This is a cross sectional self-administered questionnaire study. The questionnaire was based mainly on the work of Kaldjian et al. (2007) [33]. The research team obtained permission to use the questionnaire from the study first author then made some modifications and omissions to adapt to KHCC culture. The questionnaire was administered in English, as it is the formal language used during training and the routine medical documentation. Five-point Likert scale responses were used ranging from strongly agree to strongly disagree for questions related to attitude and ranging from very likely to very unlikely for questions related to practices. We piloted the questionnaire with no major modifications. KHCC-IRB approval was sought before any formal data collection started.

A one-day workshop was held four time at KHCC; 2 in March and 2 in July of 2019. Instructors from the SHBPP (T.A) and the University of Tennessee, Memphis (H.M) were hosted. The training included didactic introductory lectures including a lecture on the newly enacted MHLL, by the President of the Medical Association in Jordan. Group exercises were conducted using short and long case scenarios. In the short case scenarios, participants were divided and rehearsed the short cases in pairs, followed by disclosure of the event in front of the attendees, then receiving feedback by the instructors. This was followed by

two long case scenarios with role playing by a professional actor and actress, who were given the headline of the case studies; they then improvised according to the way the medical error was disclosed by the participating physicians. Notes were collected by the instructors during the scenarios and a comprehensive feedback from the instructors and actors as well as participants themselves was shared with the physicians who played the role. This was a convenient sample. At the end of the day, physicians who attended the training ( $n=55$ ) were invited to complete the questionnaire. Physicians who did not attend the training ( $n=33$ ) were approached at the end of the formal training sessions during August and September in 2019 and handled a copy of the questionnaire. To assure anonymity and transparency of responses, identifiers were not collected, including the names, departments and the employee ID number. The training team requested a limited number of participants to facilitate interaction with the trainers with feedback, especially at the conclusion of each of the case scenarios. The organizer (A.M, M.H and A.T) sent invitations to all departments at KHCC including the Department of Medical Oncology, Surgery, Pediatrics, Radiotherapy, Radiology, Nuclear Medicine, and Pathology and Laboratory Medicine, as well as the various programs including the Palliative care, Psychosocial among others. Since the training was repeated several times, consultants with different levels of experience were primarily targeted, especially those in direct contact with patients. In total there were 55 (41.1%) physicians attending the workshops out of 133 physicians at KHCC.

Data was analyzed with SPSS 19 software. Descriptive statistics were used to present the demographics and KAP. Likert-scale responses were dichotomized as follows: (1) likely/very likely versus not sure/unlikely/very unlikely and (2) agree/strongly agree versus neutral/disagree/strongly disagree. To simplify reporting in the "Results," likely signifies the combination of "likely" and "very likely" responses, and agree signifies the combination of "agree" and "strongly agree" responses. Missing data was minimal (<1.0%) and was excluded from the analysis.

The differences between response\ls of physicians' who received the training and those who did and those who did not were analyzed with chi square test and ANOVA to find out the correlation, with a p-value of 0.05 used as a cutoff measure for statistical significance.

## Results

Out of 133 full- and part-time consultant physicians working at KHCC, the questionnaire was completed by 88 (66.1%); 55 (62.50%) received training at the workshop, and 33 (37.50%) did not. There were 57 (64.8%) males and 30 (34.1%) females with a male to female ratio of 1.9:1. The mean medical practice experience of all physicians was 16.5 years (range 2 – 40 years). The mean experience for those who attended the workshop was 17.5 years, compared to 14.8 years of those who did not ( $p$ -value = 0.169). Tables 1 shows the participants characteristics.

		Received Training N= 55	Did not received training N= 33	p-value
Gender	Male	34 (61.8%)	23 (69.7%)	0.341
	Female	20 (36.4%)	10 (30.3%)	
Experience (Years)	Min	3	2	0.169
	Max	40	32	
	Mean	17.54	14.82	

Table-1; Demographics of the study cohort, including those who attended the workshops and those who did not. There was no difference in medical error disclosure between participants in relation to gender and years of experience, whether they attended the workshop or not (Table-2).

Variable		Medical error disclosure	Agree	Disagree	p-value
Gender	Male	Count (%)	39 (68.4%)	18 (31.6%)	0.786
	Female	Count (%)	19(65.5%)	10(34.5%)	
Experience		Count (median years of experience)	56 (15.84)	28 (17.82)	0.340

Table-2; Comparison of the gender and years of experience between those who attended and those who did not. harm, and major harm. Eighty-six point nine percent (n=73) of respondents in both groups were more likely to report major harm, compared to minor harm or no harm (p-value 0.000). Table-3 displays the relation between the level of harm and the percentage of reporting physicians We asked physicians about their likelihood of disclosure of errors that caused no harm, minor

Harm Caused	Number (%) of respondents who were likely to disclose	p-value
No Harm	49 (57.6%)	0.000
Minor Harm	67 (76.1%)	
Major Harm	73 (86.9%)	

Table-3 Major harm was the level at which physicians would disclose to patients.

across all physicians, while table-4 compares the results between those who attended and those who did not.

Harm Caused	Received Training	Number (%) of respondents who were likely to disclosure	p-value
No Harm	Yes	26 (50.0)	0.179
	No	23 (69.7)	
Minor Harm	Yes	40 (76.9)	0.966
	No	27 (81.8)	
Major Harm	Yes	47 (92.2)	0.162
	No	26 (78.8)	

Table-4 displays the relation between the level of harm and the percentage of physicians likely to disclose them.

Jordan's Law on Medical and Health care Liability was addressed in two questions especially that this law came into effect recently. Physicians who attended the workshop were more knowledgeable of articles and elements than those who did not attend ( $p\text{-value} = 0.017$ ). More so the difference in knowledge on decision of error disclosure was in favor of physicians who have attended the workshop ( $p\text{-value}= 0.024$ ). The majority of physicians in both groups preferred disclosure of medical errors because it is how they would want to be treated if they were patients (96.4% and 87.8%, respectively,  $p\text{-value} = 0.103$ ). They also believed that disclosure of medical errors would help them alleviate the feeling of guilt (66.7% and 45.5%, respectively,  $p\text{-value} = 0.121$ ). Almost half of the physicians in both groups believed that disclosure of medical error would not strengthen the doctor-patient relationship (50.9% and 42.4%,

respectively, p-value = 0.24). Interestingly though, physicians who received training were more inclined to disclose errors depending on their perception of whether this will help or harm the patients (72.7% and 57.6%, respectively, p-value = 0.032) of the physicians who attended the workshop.

Questions	Received Training	Respondents who agreed Number (%)	p-value
I am aware and knowledgeable of the articles/elements of Jordan's Medical and Health Liability Law	Yes	36 (66.7)	0.017
	No	15 (45.5)	
How likely would the issue of Jordan's Law on Medical and Health Liability affect your decision to disclose an error to your patient?	Yes	34 (61.8)	0.024
	No	12 (36.4)	
It is important for me to tell my patients about errors I have made in their care because that is how I would want to be treated if I were a patient.	Yes	53 (96.4)	0.103
	No	29 (87.8)	
If I made a medical error, disclosing the error to my patient would help alleviate my feelings of guilt.	Yes	47 (87.0)	0.121
	No	23 (69.7)	
Telling my patient about a medical error I have made in their care strengthens my patient's trust in me as a physician.	Yes	28 (50.9)	0.24
	No	14 (42.4)	
My decision to disclose a medical error to a patient depends on whether I think the information will help or harm him/her.	Yes	40 (72.7)	0.032
	No	19 (57.6)	

Table 5. Attitudes toward error disclosure.

In respect to professional relationships between physicians and their peers, physicians in both groups felt the need to share the burden of a medical error (76.4% vs 62.5%, p-value = 0.24). Physicians in both groups recognized at least one colleague who would give them support if needed (94.5% vs 78.8%, p-value = 0.064). Reasons chosen for wanting to share the incident with colleagues included learning whether they would have made the same clinical judgments

and decisions (90.9% vs. 78.8%, p-value = 0.149), learning from their errors (85.5% vs. 75.8%, p-value = 0.256), getting support and understanding (89.1% vs. 75.8%, p-value= 0.277), strengthening their professional relationships with the team (63.6% vs. 48.5%, p-value = 0.350), and unburdening themselves (67.3% vs. 51.5%, p-value= 0.280) for those who attended the workshop and those who did not, respectively. Interestingly, those who witnessed their mentors disclosing errors to patients were more likely to do the same in front of their students and residents than those who did not recall a similar experience with their mentors (71.0% vs. 29.0%, respectively, p-value =0.008) which reveals the importance of role modeling and the hidden curriculum.

For the relation with one's institution, both groups believed that reporting medical errors to institution improves the quality of care for future patients (96.3% in the group who received the training and 84.8% who did not, p-value=0.15). They believed that the benefits of reporting medical errors outweigh the negative consequences for those who report them (67.3% vs 66.7%, respectively, p-value = 0.290). However, 85.5% of physicians who received the training knew how to report medical errors to the institution, compared to 66.7% physicians who did not (p-value = 0.02). In addition, receiving a feedback from the institution would enhance reporting of medical errors as perceived by those who received training against who did not (85.2% vs 56.3%, p-value =0.003).

**Physicians who did not receive the training were less concerned about malpractice litigation than those who attended the workshop (30.9% vs. 12.5%, p-value 0.42).** When thinking about disclosing medical errors. Blame from colleagues (60.0% vs 50.0%, p-value = 0.584), professional discipline (59.3% vs. 67.7%, p-value = 0.720), loss of reputation, (61.8% vs. 56.3%, p-value = 0.842), negative reaction from the patients or their families (58.2% vs 75.6%, p-value = 0.089), and negative publicity in the news media (58.2% vs 65.6%, p-value = 0.564) were also of concern to both groups.

## Discussion

To our knowledge, this is the first study that looked into the effect of formal training of physicians on disclosing medical errors after the enactment of the MHLL in 2018. The purpose of this study was to investigate the different aspects associated with medical error disclosure among physicians at our center. It also aimed to measure their knowledge of the new MHLL in Jordan and its' impact on physicians' medical error disclosure. A literature review revealed that only a couple of studies addressing the issue in

Jordan were previously published [34, 35]. Our study is different as it measured the KAP among physicians with and without formal disclosure of error training and after the enactment of the MHL. Notable among our findings is the lack of significant difference in reporting major harm between both groups of physicians ( $p$ -value = 0.07). Physicians who attended the workshop gained better knowledge of the MHLL and the Center's policies ( $p$ -value = 0.017), and that these differences in knowledge was reflected on the perceived practice to disclose medical error in physicians who received the training ( $p$ -value= 0.024). This confidence about the practice of medical error disclosure in physicians who attended the workshop can either be attributed to their knowledge of the MHLL which was addressed during the workshop or to their more comprehensive understanding of the importance of disclosure after the attendance of the workshop (90.9% vs 66.7%, respectively,  $p$ -value =0.003). Moreover, 85.5% of physicians who attended the training reported better knowledge on how to report medical errors to the institution, compared to 66.7% of physicians who did not attend ( $p$ -value = 0.02). This comes in alignment with published literature on the effectiveness of educational workshops in enhancing medical error disclosure [36, 37]. When medical error disclosure KAP was stratified according to gender and years of experience, our study found no difference between respondents whether they attended the workshop or not. While some studies showed no significant gender differences regarding medical error disclosure, reporting was affected by years of experience; physicians with more years of experience were more likely to report medical errors resulting in no harm, minor harm, and major harm than residents and physicians with less years of experience [33]. In our sample, the difference might be attributable to the sample size and the homogeneity of our participants.

With respect to physician-to-physician communication and collegial relationships, physicians in both groups were able to recognize at least one colleague who would support them when needed ( $p$ -value = 0.064). They identified many reasons on why they need to share medical errors such as clarification and reassurance, to see what clinical judgment their peers would have made, and to receive the much needed emotional and moral support and understanding. This emphasizes the under-recognized need for psychological and moral support for physicians [14]. Medical error should be perceived as a learning opportunity for physicians and institutions. The toll of medical error can be heaving on physicians themselves and thus, they too, in a way, are victims of medical errors.

Research showed that the presence of role models and mentors to medical students and physicians in their early years of their career has a key impact on improving the competency in medical error disclosure through providing a passive, experiential method of learning [38, 39]. In our study, physicians who witnessed their mentors disclosing errors to patients were more likely to do so than those who did not ( $p$ -value = 0.008). This highlights the important role senior/ experienced physicians' play in shaping the future practice of residents and junior physicians as this can significantly improve their experience and capabilities of medical error disclosure. A potential venue for discussing and teaching medical errors and the significance of disclosure is through incorporating these in the curriculum of medical schools or residency programs. Current curricula lack such an important aspect as far as we know.

As to the physicians' relation with the institution, physicians attending the workshop knew how to report medical errors to the institution, compared to physicians who did not ( $p$ -value = 0.02). Furthermore, physicians who attended the workshops were more inclined to report medical errors given that they would receive feedback from the institution ( $p$ -value = 0.003). Thus, orientation of the newly hired physicians and a continuous update to physicians at their institutions must be a prerequisite for the continued professional development scheme. Moreover, building a no-shame-no-blame culture in the institution will provide a safe space for physicians to enhance a culture of transparency.

Medical error disclosure can be more sensitive in cancer care, an environment where medical errors can be especially detrimental. In literature, oncologists agreed that medical errors should be disclosed. However, fear of legal litigation was one of the main barriers to error disclosure, along with fear of negative reaction or distrust from their patients, and institutional pressure regarding medical error disclosure [40, 41], which is concordant with our findings at KHCC. One other aspect is that oncologists tend to carry more emotional burden when medical errors occur to their patients [27], further stressing on the need for emotional and psychological support to physicians from their peers and their institution to cope with medical errors.

We acknowledge some limitations in our study. First, the data was obtained from a single center with a relatively small number of participants. Also, while the official language of Jordan Arabic, the workshops and the role-playing were held in English, a factor that does not mirror real world practice, when medical errors have to be disclosed in Arabic. Additionally, some of the attendees expressed language barrier and advised for future consideration of training in Arabic. Indeed, when the trainees suggested a simulation in Arabic, the fluency and compassion of the error disclosure was more effective. This would call to assimilate some workshops in the mother tongue of the patients and physicians. Likewise, future studies tailored to accommodate the cultural norms in each community are in need. Whereas the patient and one to a few relatives are involved in disclosure of errors in Western culture, the need to disclose and explain the encounter usually involves many individuals including the extended families is the norm in ours. In addition, although physicians working at KHCC were the primary target, and despite the small sample size, the results can probably be generalizable since the topics discussed, the update on the new MHLL, and the case scenarios were not cancer specific. We recommend repeating the training to include more physicians from other health sectors across the country.

## Conclusion

Education of physicians on error disclosure by conducting the workshops using simulation helped physicians become more knowledgeable and competent. The workshop improved their comprehension on the MHLL, as the attendees acknowledged MHLL as one of the most important triggering factors in wanting to learn how to disclose medical errors. We also acknowledge the support needed from peers and institutions, as well as the importance of professional role model. We recommend extending the workshops to more institutions, and the need to incorporate it in medical curricula at different universities. We also recommend adding training on medical error disclosure and the local policies per

institution, as well as raising more awareness of the MHLL. Further studies are recommended where other institutions and more physicians are involved. The value of integrating such training in the curricula of medical schools and residency training programs cannot be over-emphasized.

## Abbreviations

AUBMC	American University of Beirut Faculty of Medicine and Medical Center
HEC	Hospital Ethics Committee
IRB	the Institutional Review Board
KAP	knowledge, attitudes and practices
KHCC	King Hussein Cancer Center
MHLL	Medical and Health Liability Law
SHBPP	Salim El-Hoss Bioethics and Professionalism Program

## Declarations

**Ethics approval and consent to participate;** this is to confirm that ethical approval was

obtained from KHCC-IRB, and that all subjects read and agreed to participate voluntarily. KHCC-IRB waives the need for documentation of the informed consents when either the **a-** only record linking the subject and the research would be consent document and the principle risk would be potential harm resulting from breach of confidentiality, or **b-** The research presents no more than minimal risk of harm to subjects and the research involves no procedure for which written consent is normally required outside of the research context. Thus KHCC-IRB approved the study with waiver of written documentation as in part b. A cover page at the beginning of the questionnaire is that includes all the elements of the IC document. Agreeing to complete the questionnaire is considered as an “implied” approval to participate in the study.

**Consent for publication;** this is to confirm that all participants agreed to the publication of anonymized data.

**Availability of data and material;** the dataset supporting the conclusions of this article is available with the Corresponding author and is present upon request.

**Competing interests;** this is to confirm that all authors have no competing interest.

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Authors' contributions

1. Inception of the idea; MH, AM, THA.
2. Collection of the data; AT, KA.
3. Analysis and interpretation of the data; RM, MH, KA, AT.
4. Writing the first draft; RM.
5. Reviewing the draft; MH, KH, AM, THA
6. Final approval; all authors
7. Accountability on the content; all authors.

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