

Efficacy of clinical medical training on knowledge, attitude, and practice regarding child maltreatment in medical students: An 18-month longitudinal study

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Abstract

Background: Child maltreatment or abuse has been a worldwide major problem and has remained a persistent public health challenge in all countries. Physicians have a significant role in the prevention and intervention of child maltreatment. An educated physician that can effectively identify and report child maltreatment, can fill one of the largest gaps in reducing child abuse.

This study was performed to examine the efficacy of clinical medical training regarding child maltreatment among Iranian medical students and outcome of knowledge, attitude, and practice in regards to child maltreatment.

Method: All the medical students (235 students) of the Iran University of Medical Sciences who passed the internship entrance exam in 2019-2020 academic year participated in this study. The participants completed the questionnaire about their attitude, knowledge and practice skills in the first month of their internship course and then completed the same questionnaire 18 months later, at the end-point of the internship period.

Results: 139 (59.1%) participants were female and 96 (40.9%) were male. The mean age of the subjects was 24.35 ± 0.76 . Only 7 (3%) of them formerly received any education about child maltreatment.

There was a significant difference in scores of the knowledge of diagnosis ($p\text{-value} < 0.001$), the practice of prevention ($p\text{-value} < 0.002$) and the general subscale of the practice section ($p\text{-value} < 0.001$) during the internship course. However, the performance of participants decreased with a significant difference in the subscales of the attitude towards diagnosis ($p\text{-value} < 0.001$) and the attitude towards reporting ($p\text{-value} < 0.001$).

At the end of the study, the result of graduated physicians was: The total knowledge and attitude of participants were satisfactory and the majority of the participants were at good levels. Although, in the practice subscale, 70.6% of the participants didn't identify, 84.7% didn't refer, and 86.4% didn't report a case of child abuse in the past year.

Conclusion: The knowledge and attitude of Iranian recently graduated physicians regarding child maltreatment are at a satisfactory level. Although, the practice level has deficiencies and needs more education. In addition, Iranian medical training regarding child maltreatment is not sufficient and there are multiple obstacles that need to be solved.

Background

Child maltreatment or abuse has been a worldwide major problem and has remained a persistent public health challenge in all countries, regardless of their income level(1). The World Health Organization (WHO) defines child abuse as any interaction in the context of a relationship of responsibility, trust or

power, that violates children's rights and results in harm to children's dignity, development or life(2). Child maltreatment consists of neglect, physical, sexual and emotional abuse(3).

A long record of research has studied the negative outcome of child maltreatment. Alongside the short-term consequences(4–6), child abuse can cause different long-term impacts, such as depressive, anxiety and eating disorders, antisocial behaviors, somatic symptom disorders, suicidal and self-harm behaviors and substance use disorder(7–12).

WHO reports that internationally, 3 of 4 children aged 2–4 years suffer from child maltreatment, and 1 in 5 women and 1 in 13 men have been sexually abused as a child. Additionally, many studies have shown that the rate of child abuse has raised during the COVID-19 pandemic(13). However, these numbers underestimate the true size of the issue due to a lack of reports.

Iran has a population of more than 80 million with a high rate of the youth population. Around 30% of Iran's population is under 18 years old(14, 15). In reports of a systematic review and meta-analysis performed in 2014 on child abuse in Iran, the pooled estimate of the prevalence of child emotional abuse was 64.5%, it was 43.59% for physical abuse and 40.94% for neglect(3). Reporting child maltreatment is not mandated in Iran and there is no protocol for it. Hence, many cases are missed. In addition, due to religious beliefs and social and cultural context, reporting child abuse is truly challenging in Iran(16).

Physicians have a significant role in the prevention and intervention of child maltreatment(17–19). They have regular contact with children during well-child visits and vaccination appointments, which is the least health-care action that all the parents, regardless of their persistence, should perform(20). An educated physician that can effectively identify and report child maltreatment, can fill one of the largest gaps in reducing child abuse(21). Some studies have shown several factors that cause low rates of reporting child maltreatment among medical professionals and medical students. These factors and characteristics consist of lack of specified training, feeling unprepared and under trained, fear of having a negative impact and being unsure of the adequacy of facts(20, 22–26).

Medical training in Iran takes 7 years that consists of the following: 1) Two years of Basic Science Training 2) Three and half years of clinical theoretical and observational training followed by "Pre-Internship Examination" 3) Eighteen months of Internship. In the internship course, medical students are working as interns in specialized hospital wards with the supervision of board-certified specialists who provide expertise, professional and ethical practice and role modeling in providing patient care(27, 28).

Clinical internships are considered as the courses that enable learning in the real environment and turning theoretical knowledge into the practical skills(29). Internship courses of medical students in teaching hospitals has a key role in training special subjects like prevention strategies, social accountability and managing skill(30, 31).

Several studies have been conducted on the attitude, knowledge and experience of medical professionals regarding child maltreatment in different countries. All of these studies have shown unsatisfactory results

in, at least, one of the attitude, knowledge, management or practice areas(16, 32–38).

This study was performed to examine the efficacy of medical training regarding child maltreatment in medical students, by investigating the changing of their attitude, knowledge and practice during the internship course (last 18 months of medical training that medical students work as interns in teaching hospitals), and outcome of knowledge, attitude and practice in regards to child maltreatment amongst recently graduated physicians in Iran University of Medical Sciences, Tehran, Iran, by a longitudinal study.

Materials And Methods

Design and Participants

The subjects of this longitudinal study consisted of all the medical students (235 students) of the Iran University of Medical Sciences who passed the internship entrance exam in 2019-2020 academic year.

The exclusion criteria were: 1) reluctance to participate 2) history of passing the internship course in another country 3) history of studying another academic major.

The participants completed the questionnaire about their attitude, knowledge and practice skills in the first month of their internship course and then completed the same questionnaire 18 months later, at the end-point of the internship period.

Assessment Tool

The questionnaire on attitude, knowledge and practice skills toward child maltreatment was used to gather the data.

In the study of Deshpande et al. in India which examined the attitude and knowledge in regards to physical child abuse among medical and dental students, a questionnaire with 18 items was developed and used. Each item is a self-report, wrong/right sentence. The reliability and validity of this questionnaire were examined and reported in the same study(39).

In the study of Kara et al. in Turkey evaluating the attitude and knowledge of pediatricians and pediatric residents in regard to child abuse, a 25 items scale was developed. Items are about taking history, examination and symptoms and each question have three “yes, no, I don’t know’ self-report answers. The Cronbach alpha values were reported to be 0.68, 0.72 and 0.77 for “Symptoms”, “History” and “Examination”, respectively(40).

In the study of Lane et al. with the title “Primary care pediatricians' experience, comfort and competence in the evaluation and management of child maltreatment”, a 38-item questionnaire was developed and used to evaluate the knowledge, comfort and competence of pediatricians(41).

In the study of Abouei et al. with the title ‘Knowledge, attitude, and practice in regards to child maltreatment among Emergency Medicine residents in Tehran’, these three questionnaires have been

combined and after deleting the duplicate questions, a 49-item scale to evaluate the knowledge, attitude and practice of medical professionals has been developed. They reported acceptable face validity and good internal consistency for this newly developed questionnaire (Cronbach’s alpha=0.71)(42).

The subscales of this questionnaire are: 1) Knowledge subscale: 20 self-report “yes/no” questions with 46 scores: Eight questions about knowledge of prevention (16 scores), eight questions about knowledge of diagnosis (24 scores), two questions about knowledge of treatment (two scores) and two questions about knowledge of reporting (four scores). 2) Attitude subscale: 15 self-report likert scale with 33 scores: Four questions about the attitude towards prevention (eight scores), five questions about the attitude towards diagnosis (15 scores), two questions about the attitude towards treatment (two scores) and four questions about the attitude towards reporting (eight scores). 3) Practice subscale: 12 self-report questions (nine likert scale and 3 “yes/no” questions): one question about the practice of prevention (two scores), two questions about the practice of diagnosis (five scores), two questions about the practice of treatment (two scores), four questions about the practice of reporting (six scores) and three “yes/no” questions generally about the practice with four scores.

The knowledge subscale of the questionnaire was categorized into three levels: 1) poor: a score of less than 50% 2) moderate: a score of 50–70% 3) good: a score over 70%(37, 43, 44).

Statistical Analysis

For statistical analyses we used SPSS 24. We examined the changing in each subscale’s scores of the questionnaire and variables in response to each subscale by using paired t-test. For testing the significant differences, we considered P-values less than 0.05.

Results

Participants

Table 1. Frequency Distribution of Demographic Characteristics

		Frequency	Percent
Sex	Female	139	59.1
	Male	96	40.9
Marital Status	Single	212	90.2
	Married	23	9.8
Former Education on child maltreatment	Yes	7	3
	No	228	97

A total of 235 medical students participated in the study that 139 (59.1%) of the participants were female and 96 (40.9%) were male. The mean age of the subject was 24.35 ± 0.76 . 212 (90.2%) of participants were single and only 7 (3%) of them formerly received any education about child maltreatment (at the start of the study).

The frequency distribution of demographic characteristics of participants is shown in table 1.

Knowledge, attitude and practice of medical practitioners toward child maltreatment

Table 2. Frequency Distribution of Participants’ Answer to Each Item of Knowledge, Attitude and Practice Regarding Child Maltreatment Scale, in the End of Internship Course

Knowledge of medical practitioners about child maltreatment			
Knowledge of prevention questions		Yes (%)	No (%)
Prevention of unwanted pregnancies can reduce the risk of child abuse		95.7*	4.3
Child abuse prevalence is higher in forced marriages or very young couples		94.5*	5.5
Talking to the child about sexual abuse can cause fear or perversion		11.9	88.1*
To prevent child abuse, educating the children is more effective than educating the families		52.8	47.2*
The risk of exposure to abuse in a child with anomaly and disability is higher compared to other children		92.3*	7.7
Financial support of low-income families can prevent child abuse		91.1*	8.9
In families with broader social relationships, children are more likely to be abused		22.1	77.9*
Parents who have been abused as children themselves are less likely to abuse their children.		17.4	82.6*
Knowledge of diagnosis questions		Yes (%)	No (%)
Children who have been abused, usually tell someone soon after the abuse		1.7	98.3*
Emotional and psychological signs of abuse may include fear of going home or of the parents		88.1*	11.9
A history that is vague and differs every time the parent tells it is a possible indicator of abuse		96.6*	3.4
The abuser in most cases is someone the child knows well		81.7*	18.3
Child abuse and neglect rarely occur amongst middle- or high-income earners		31.5	68.5*
Bruises over bony prominences are suspicious of abuse (e. g., chin, elbows, and knees)		59.1	40.9*
Burns are associated with many child-abuse cases		56.2*	43.8
If a child who has gained toilet education starts to wet his/her bed again, this may be a finding of child abuse		91.1*	8.9
Knowledge of treatment questions		Yes (%)	No (%)
In treatment of child abuse	Group and family therapies are most important	89.8*	10.2
	Drugs have no use	30.2	69.8*
Knowledge of reporting questions		Yes (%)	No (%)
Physicians are morally responsible to report any sign of child maltreatment		96.6*	3.4
Even with high suspicion of child maltreatment, physicians can not report it		9.4	90.6*

without the family consent						
Attitude of medical practitioners towards child maltreatment						
Attitude towards prevention of child abuse statements		Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
It is really important to educate physicians about child abuse		71.1	26.4	2.6	0	0
It is important to revise the laws about child abuse to prevent it		64.7	29.4	4.7	1.3	0
I'd like to attend workshops or symposiums to improve my knowledge regarding child abuse		40.9	45.5	10.6	2.6	0.4
Due to children's fear and embarrassment of reporting child abuse, even allowing the child to contact child abuse prevention centers is ineffective in reducing its rate.		27.7	40	20	10.2	2.1
Attitude towards diagnosis of child abuse statements		Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
The basics of how to diagnose possible child abuse should be taught to physicians.		63.4	33.6	2.6	0.4	0
A child suspected of child abuse should be evaluated by a physician at the first visit.		64.7	30.2	4.7	0.4	0
Most physicians do not have enough time in their office to evaluate patients suspected of child abuse.		16.2	53.2	23	7.7	0
I prefer to refer a case suspected of child abuse to a pediatrician.		18.3	34.5	29.4	16.6	1.3
I prefer to refer a case suspected of child abuse to a psychiatrist		40.4	46	11.5	2.1	0
Attitude towards treatment of child abuse statements		Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
Teaching the family about child abuse is one of treatment ways		48.1	43	8.1	0.9	0
Psychological and social support for families is one of the ways to treat child abuse.		50.2	44.7	4.7	0.4	0
Attitude towards reporting of child abuse statements		Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly Disagree %
My reasons for not reporting suspicions	Possible effect on the child	14	32.8	26.8	21.7	4.7

case of child abuse is	Fear of anger from parents and family	9.4	31.9	30.6	21.3	6.8
	No legal obligation or authority to report	6.4	22.6	31.9	26.4	12.8
	Possible effect on my practice	9.4	27.7	30.6	20.4	11.9
Practice of prevention questions			Zero %	One or two %	Three to five %	More than five %
How many child-abuse conferences have you attended in the last three years?			70.2	29.4	0.4	0
Practice of diagnosis questions			Zero %	One or two %	Three to five %	More than five %
How many suspected cases of child abuse have you identified in the past year?			70.6	28.1	1.3	0
How many suspected cases of child abuse have you identified during your career?			63.4	31.9	4.7	0
Practice of treatment questions			Zero %	One or two %	Three to five %	More than five %
How many suspected child-abuse cases have you referred in the last year?			84.7	14.9	0.4	0
How many suspected cases of child abuse have you referred during your career?			81.3	18.3	0.4	0
Practice of reporting questions			Zero %	One or two %	Three to five %	More than five %
How many suspected cases of child abuse have you reported in the past year?			86.4	13.6	0	0
How many suspected cases of child abuse have you reported during your career?			82.1	17.4	0.4	0
How many suspected child-abuse cases have you not reported in the past year?			88.5	10.6	0.4	0.4
How many suspected cases of child abuse have you not reported during your career?			90.2	9.4	0	0.4
General practice questions					Yes %	No %
Have you been trained in child abuse before graduation?					55.3	44.7

Have the methods you have been taught to diagnose child abuse been sufficient?	14.9	85.1
Have you ever tried to talk to parents about preventing child abuse?	27.7	72.3

*Correct answer

We evaluated the answers of our participants to each item of knowledge, attitude and practice regarding child maltreatment, at the end of the internship course (at the end of medical school).

More than 77% percent of participants correctly answered seven of eight questions on the knowledge of prevention subscale. Near all of the participants (98.3%) correctly reported that children who have been abused generally delay telling someone about the incident, 81.7% identified that in most cases, the abuser is someone the child knows well, and 68.5% agreed that child abuse can occur in high socioeconomic groups and is not primarily associated with poverty. Regarding signs of child maltreatment, 91.1% of the participants correctly identified wetting the bed after gaining toilet education, 88.1% detected fear of going home or of the parents, 96.6% identified vague history, and 56.6% reported burn signs. 59.1% of the participants didn't know that bruises over bony prominences are not a sign of abuse. More than 90% of the participants answered both questions of knowledge of reporting questions correctly.

The frequency distribution of participants' knowledge levels (poor, moderate and good) towards child maltreatment, at the end of the internship course (end of medical training) is shown in table 3. According to this table, the total knowledge of 209 (88.93%) participants is good and none of the subjects are at a poor level. Also, there are no participants with a poor level of knowledge of prevention and diagnosis.

Table 3. Frequency Distribution of Participants' Knowledge Level (Poor, Moderate and Good) Regarding Child Maltreatment, in the End of Internship Course

		Frequency	Percent
Knowledge	Prevention	Poor	0
		Moderate	27
		Good	208
	Diagnosis	Poor	0
		Moderate	39
		Good	196
	Treatment	Poor	9
		Moderate	77
		Good	149
	Reporting	Poor	4
		Moderate	22
		Good	209
	Total	Poor	0
		Moderate	26
		Good	209

In the subscale of Attitude towards prevention of child abuse, nearly all of the participants (97.4%) strongly agreed/ agreed with the importance of child abuse education, and (94%) revising the child abuse laws. 86.4% of the participants strongly agreed/ agreed to attend workshops or symposiums to improve their knowledge regarding child abuse. Although 67.7% strongly agreed/ agreed that due to children's fear and embarrassment of reporting child abuse, even allowing the child to contact child abuse prevention centers are ineffective in reducing its rate.

In the attitude towards the diagnosis of child abuse statements, 94.9% of participants strongly agreed/ agreed that a child suspected of child abuse should be evaluated by a physician at the first visit. 52.8% of the participants strongly agreed/ agreed to refer a case suspected of child abuse to a pediatrician and 86.6% to a psychiatrist.

More than 90% of participants strongly agreed/ agreed that family education and psychological and social support for families are ways of treatment of child abuse.

In the subscale of attitude towards reporting, the most reasons that the participants were strongly agree/ agree for not reporting suspicions cases of child abuse were: 46.8% possible effect on the child, 41.3%

fear of anger from parents and family, 37.1% possible effect on practice and 29% no legal obligation or authority to report.

In the practice subscale, 70.2% of the participants had never attend a child-abuse conference in the last three years. 70.6% of the participants didn't identify, 84.7% didn't refer, and 86.4% didn't report a case of child abuse in the past year. 55.3% of the physicians had been trained in child abuse before graduation but 85.1% believed the methods they have been taught to diagnose child abuse were not sufficient.

The frequency distribution of participants' answers to each item of knowledge, attitude and practice regarding the child maltreatment scale, at the end of the internship course is shown in table 2.

Change of Knowledge, Attitude and Practice of Medical Students toward Child Maltreatment during Internship Course

Table 4. Change of Knowledge, Attitude and Practice of Medical Students toward Child Maltreatment during Internship Course

		Start of internship course		End of internship course		P-Value
		Standard Deviation		Standard Deviation		
		Mean		Mean		
Knowledge	Prevention	12.65	2.48	13.38	2.05	<0.001
	Diagnosis	18.49	3.57	18.63	3.08	0.64
	Treatment	1.55	0.57	1.59	0.56	0.44
	Reporting	3.89	1.95	3.74	0.76	0.27
Attitude	Prevention	5.96	0.93	5.84	0.82	0.13
	Diagnosis	10.22	1.47	9.83	1.34	<0.002
	Treatment	1.73	0.28	1.7	0.26	0.22
	Reporting	4.5	1.93	3.84	1.56	<0.001
Practice	Prevention	0.15	0.4	0.3	0.46	<0.001
	Diagnosis	0.33	0.66	0.38	0.5	0.35
	Treatment	0.15	0.77	0.17	0.31	0.71
	Reporting	0.29	0.64	0.27	0.47	0.69
	General	0.68	1.06	1.12	1.08	<0.001

There is a significant improvement in scores of the knowledge of diagnosis (95% CI -0.73 [-1.14, -0.31] p-value<0.001), the practice of prevention (95% CI -0.15 [-0.22, -0.07] p-value<0.001) and the general

subscale of the practice section (95% CI -0.44 [-0.63, -0.24] p-value<0.001) during internship course.

However, the performance of participants decreased with a significant difference in the subscales of the attitude towards diagnosis (95% CI 0.39 [0.13, 0.64] p-value<0.001) and the attitude towards reporting (95% CI 0.66 [0.34, 0.97] p-value:<0.001).

There is no significant difference in the scores of other subscales.

The change of knowledge, attitude and practice of medical students toward child maltreatment during the internship course is shown in table 4.

Comparison of knowledge, attitude and practice of medical practitioners towards child maltreatment in terms of their sex and marital status

There is a significant difference between the change of the scores of the subscale of the practice of prevention (95% CI -0.16 [-0.00, -0.31] p-value: 0.03) and reporting (95% CI 0.29 [0.08, 0.49] p-value<0.001) during the internship course in terms of the sex of participants (with better performance of female subjects). Although, there is no significant difference between scores of other subscales.

There is a significant difference between the change of the scores of the subscale of the practice of treatment (95% CI -0.27 [-0.48, -0.55] p-value: 0.01) and reporting (95% CI -0.28 [-0.55, 0.00] p-value: 0.04) during the internship course in terms of the marital status of participants (with better performance of married subjects). Although, there is no significant difference between scores of other subscales.

Discussion

Our study aimed at identifying the knowledge, attitude and practice of Iranian medical physicians toward child maltreatment and evaluating the medical training system in this regard.

The results of our study indicated a satisfactory level of knowledge and attitude towards child maltreatment among physicians. 88.93% of the subjects received more than 70% of scores in the knowledge subscale and only 1.7% of subjects were on the poor level in the attitude section which is higher than reported in physicians in Egypt (41%)(44) and community health workers in Tabriz, Iran(38).

Unwanted pregnancies and young age of parents and the disability in children have been detected as child maltreatment risk factors by more than 90% of the participants. History of abuse in a parent reported as a risk factor by 80% of the participants, respectively. 68.5% of the participants agreed that child abuse can occur in high socioeconomic groups and is not primarily associated with poverty. These results are much higher than reported in family physicians in France(45).

98.3% of the participants successfully identified that the children who have been abused, usually delay telling someone about the abuse which is higher than reported in medical and dental residents in Gujarat,

India (69.23%)(39), physicians in teaching hospitals in Egypt (70%)(44), and medical and dental doctors in Pakistan (74.1%)(46).

In diagnosing the sign and symptoms of child maltreatment, the knowledge of participants was sufficient in almost all questions. Although, 59.1% of participants detected the bruises over bony prominences as a sign of abuse and didn't have the knowledge that most such injuries are in fact unintentional(47, 48). Even so, this number is much lower than reported in physicians in Egypt(44) and dentists in Jordan(49), Saudi Arabia(50) and United Arab Emirates(51).

96.6% of the participants admitted that physicians are morally responsible to report any sign of child maltreatment which is in agreement with reported in dentists in Germany(47), and physicians in Gujarat, India (39) and Egypt(44).

The total Attitude score mean was 69.9% which is higher than reported among dentists in Iran in 2017(37).

In the subscale of Attitude towards prevention of child abuse, near all of the participants (97.4%) strongly agreed/ agreed with the importance of child abuse education which is in agreement with results reported among physicians in USA(41), Sri Lanka(36), and higher than physicians in Gujarat, India(39).

86.4% of the participants wanted additional training in child maltreatment which is in agreement with results reported in dentists in Australia(52) and physicians in Sri Lanka(36).

The majority of the participants prefer to refer a case suspected of child abuse to an expert (52.8% to a pediatrician and 86.6% to a psychiatrist) which is in agreement with the results of the study Lane and Dubowitz(41).

The practice of child maltreatment was the most conflictual area among Iranian physicians. 63.4% of the participants have never diagnosed and 82.1% have never reported a case of child abuse which is higher than reported in physicians in Egypt(44) and Sri Lanka(36) and pediatricians in Kuwait(35). The main reasons for underdiagnosis and underreporting are the lack of knowledge or the negative attitude(44). These differences, despite the higher scores in attitude and knowledge, suggest other reasons. As reported in the result section, the main reasons for not reporting in our participants were: possible effect on the child (46.8% agreed), fear of anger from parents and family (41.3% agreed), no legal obligation or authority to report (29% agreed) and the possible effect on their practice (37.1% agreed).

The number of diagnosing and reporting a case of child abuse suggests that 18.6% of the participants diagnosed a case of maltreatment but did not report it. Although, 90.2% of the participants mentioned that they have no history of not reporting child abuse. It suggests that 8.8% of the participants were not completely sincere in answering the questionnaire. This matter and the lower rate of diagnosis and reporting (despite the satisfactory level of knowledge and attitude) suggest the stigma of child abuse among Iranian physicians. Reporting child maltreatment is not mandated in Iran and there is no fixed strategy for it. Some of the cases are referred to the police and some cases are reported to welfare

organizations. In addition, social, cultural and religious contexts cause many challenges in reporting abuse cases(16).

In 235 medical students (with a mean age of 24.35 ± 0.76) at the start of the internship course, only 7 (3%) students formerly received any education about child maltreatment. This result is the same as the study of Li et al.(33) in China (3.19% of health-care professionals had ever received education on child maltreatment intervention) and the study of Pelletier and Knox in America(21) (4.5% of medical students had received more than 5 hours of training on child abuse). There are some differences between our study and the studies which report higher former education: the subjects of some studies are not physicians nor the participants are not medical students(39, 44, 46). In particular the study of Sahebihagh et al.(38) which was performed in Tabriz, Iran and has reported 26.99% of former education. The participants of this study are not physicians with a mean age of 39 ± 7.85 and 14 ± 8.14 years of work experience.

We have evaluated the change of knowledge, attitude and practice of medical students toward child maltreatment during the internship course (which is the last 18 months of the medical training in Iran and medical students work as interns in teaching hospitals) to examine the medical training system regarding child maltreatment.

There was no significant difference in five of eight knowledge and attitude subscales. The knowledge of diagnosis of the medical students improved significantly during the internship course. Although, the scores of attitudes towards diagnosis and reporting significantly decreased. In addition, the scores of the practice of prevention and general practice improved during the internship course.

In spite of the fact that the level of knowledge and attitude among medical students are satisfactory after the internship period, our results have shown that Iran's medical training towards child maltreatment is not sufficient. It was successful in the knowledge area and identifying the sign and symptoms of child maltreatment but the fact that the attitude of medical students decreased is a concerning point. One of the possible reasons can be the difference and paradox that medical students encounter between what they theoretically have learned and what is actually happening in teaching hospitals. There are many ethical, legal and cultural challenges regarding child maltreatment that happen in the medical working places(16). Despite what medical students have learned in theory, they will face uncertainty about the child future, the results of reporting, the situation of welfare centers and the capability of welfare organizations(16).

On the other hand, despite significant improvement in two of five subscales of the practice of medical students, the score of the practice at the end of the internship course is not yet satisfactory. The main questions in the practice of prevention and general practice subscales are about the training courses regarding child maltreatment. The scores of the other subscales which mainly are about diagnosing, treatment and reporting (which are aspects that are actually happening in the practice of a physician) are not changed during the internship course.

In addition to what have been mentioned so far, legal problems are other difficulties in practicing and even educating the medical students regarding child maltreatment. According to the Iran's law, children's guardians are their fathers and fathers have the right to discharge the under 18years old children against medical advice (unless there is an urgent life-threatening matter)(53). In many cases the abusive father can discharge the child and as child maltreatment is not mandatory in Iran, the child abuse reporter is not supported by the law(53). On the other hand, in Iranian culture father or husband is the head of the family and the decision maker and the children grow with the value of being a good child for the parents(54).

All these obstacles and their paradox with what medical students learn theoretically before working in hospitals interfere with their education and practice.

There is a significant difference between the change of the scores of the subscale of the practice of prevention and reporting during the internship course in terms of the sex of participants (with better performance of female subjects). This result is congruent with the study of Sanyuz(55) which the majority of the physicians who made a child abuse diagnosis were females. This difference might be explained by the different role of females regarding children. Due to their conventional role, females are more concerned and involved with children(56).

There is a significant difference between the change of the scores of the subscale of the practice of treatment and reporting during the internship course in terms of the marital status of participants (with better performance of married subjects). In the study of Kara et al.(40) among physicians in Ankara, it has been shown that the knowledge of married physicians regarding child maltreatment is significantly higher than the single physicians but there is no examination of the level of practice of physicians regarding child abuse in terms of their marital status in other studies. This difference can have multiple reasons: the difference in involvement and preoccupation with children between married and single people, as the child baring is considered a value in Iranian culture(57), higher empathy in married people(58), and higher empathic skills (such as sharing and helpfulness, and internalizing the moral values) in married couples(59).

Conclusion

The results of our study reveal that the knowledge and attitude of Iranian physicians regarding child maltreatment are at a satisfactory level. Although, the practice level has deficiencies and needs more education. In addition, Iranian medical training regarding child maltreatment is not sufficient and there are multiple obstacles that need to be solved.

Limitations And Suggestions

With an adequate sample size and following the same subjects for 18 months, we tried to minimize the limitations. Although, our participants were from one university in Tehran which is the capital city of Iran and it may not represent the whole country. Iran University of Medical Sciences is a public university and

has students from all parts of the country and this fact can decrease the limitation. However, this university is one of the top ranked universities in Iran and the results may be different in other institutes.

For further research, we suggest multicenter studies from different parts of the country and investigating the exact flaws in medical training regarding child maltreatment.

Abbreviations

World Health Organization: WHO; confidence interval: CI

Declarations

Ethics approval and consent to participate

Questionnaires were collected anonymously in the first month of the internship course and each participant's contact number and questionnaire were identified with a unique code number and written consent was obtained from the participants. At the end of the internship course, the same anonymous questionnaires were completed and then the contact numbers of participants were discarded.

In the current study, permission to use human participants was granted by the Iran Medical University's Ethics Committee (code: IR.IUMS.FMD.REC.1399.005). Through the study the principles of the Declaration of Helsinki and also rules of the Ethics Committee of Iran Medical University were observed. Participants were told not to sign their names on the survey. The participants were informed that they have full authority to refuse to participate and to complete the questionnaire.

Consent for publication

Not applicable

Availability of data and materials

The datasets generated and/or analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors have no conflicts of interest to report.

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Authors' contributions

MB, MN, SS, FH and MS made substantial contributions to the conception and design of the work. MB, MN and MS have substantial contribution in data gathering. SM, MN and MS analyzed and interpreted the data. MB, SM, MN and MS have major contribution in writing the manuscript. All authors read and approved the final manuscript.

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