Background: Child health improvement is one of the most important indexes in health programs among all countries. One of the eight millennium development goals for 2015 is reduction of child mortality. Based on WHO recommendation Integrated Management of Childhood Illness (IMCI) is one of the most effective strategies to reduce under five mortality rates. In this study, we tried to compare knowledge and clinical skills about most common childhood illnesses among medical students after IMCI training with control group.

Methods: We performed a control trial on two medical inter student groups who were training in pediatric department. Our study was done in Zahedan University of Medical sciences in 2014. We evaluated 18 students in first group (control) and 19 students in second group (intervention). Control group was trained based on routine program education and intervention group educated both routine program and IMCI guidelines.

Results: We observed significant differences in knowledge score between control and intervention group (P<0.001). Also skill score about management of danger signs in intervention group was significantly higher than control group (P<0.001).

Conclusions: IMCI training can be a logical way to improve education quality in pediatric department. Medical students can improve their knowledge and skills effectively through this training.

Keywords: Childhood Illness; Knowledge; Clinical Skill; Medical Student
INTRODUCTION
The most important purpose of medical sciences universities is educating efficient and expert manpower and providing health services relevant to society needs regarding the facilities and conditions for promoting health. Medical education policy makers believe that medical education system should proceed and develop in a way that it can utilize the latest universal scientific achievements which are compatible with society needs. Improving children health and promoting children health indicators are of the most important society health status indicators and of the most prominent quality indicators of providing medical services in community. As one of the development purposes of the third millennium is declining children mortality (1-5).
One of the effective solutions recommended by WHO to decline mortality of children under 5 is integrated managements of childhood illness (IMCI) which its intervention efficacy on promoting children health has been proved in many populations (4). The overall purpose of IMCI is to decline mortality of children under 5 due to prevalent childhood illnesses.
Evaluation, classification, treatment, follow-up and counseling of ill children is done in two groups of under 2 month old and 2 months to 5 years old in IMCI strategy based on the inserted information in two booklets, IMCI strategy is being carried out in all Iranian rural health centers now. The most part of general practitioner’s clients are children and also, in the first level of health network system in deprived and remote regions like rural areas, patients only have access to general practitioners (GP). Then enough expertise in management of the most common children complaints for GPs especially in conditions with lack of diagnostic and therapeutic equipments is of great significance. We tried in this study to compare knowledge and clinical skills of medical students related to the most common children complaints after IMCI education with control group.

METHODS
This study is a control trial. Participants were two groups of 18 and 19 interns of pediatric course that were evaluated during two periods of three months during 2014. We selected this student by convenience sampling. Inclusion criteria were every intern medical student who started pediatric course for first time and exclusion criteria were calculated as follows: students who failed internship pediatric course during two periods of three months during 2014. We selected this student by convenience sampling. Inclusion criteria were every intern medical student who started pediatric course for first time and exclusion criteria were calculated as follows: students who failed internship pediatric course during two periods of three months during 2014.

Students allocation in two groups was randomly because we didn’t have any selection criteria for each group and total grade point average in two groups were not statistically different. First group from 21 March to 21 Jun 2014) selected as control group and second group (22 Jun to 22 September 2014) selected as intervention group. Also because pediatric course conditions have been the same during two periods regarding pediatricians, students’ shifts and ordinary educational programs.

This study was single-blind; examiners were blind because they didn’t know about coarse education details and exam method was same in the two groups.

RESULTS
The first group have been trained routine pediatric training and were evaluated at the end of the period but the second group were trained IMCI in addition to routine trainings. From the beginning of the second month of the course their training included workshops in clinical skills laboratory; theoretical and practical training in clinics based on IMCI instructions and were evaluated at the end of the course.

At the end of every course we evaluated students as below: At first students’ skills were evaluated by Observed Structured Clinical Examination (OSCE) in clinical skills laboratory and designing six clinical stations. 6 items of the most common and crucial children complaints were proposed in those 6 stations and students’ skill was assessed as a score. Content validity of OSCE was confirmed by pediatric and community medicine departments based on IMCI booklets.

Then a questionnaire was used to examine students’ knowledge. This questionnaire was designed based on common children complaints and management stages. It includes 5 open ended questions which assess knowledge in cases of classification, illness diagnosis, drug prescription, growth monitoring and nutritional recommendations. One positive score was allocated to key points which students have to mention, totally 18 key points related to classification and diagnosis of illnesses should have been mentioned. Proper treatment selection included 9 total correct responses, 7 scores were considered for nutritional recommendation and key points of growth monitoring.

Finally total scores of the questionnaire were calculated and its mean was analyzed by Mann Whitney statistical test. (Three pediatricians and one community medicine specialist confirmed the content validity of the questionnaires based on IMCI booklet and its reliability was evaluated by piloting on 15 medical students before intervention and we calculated Cronbach alpha as 0.81.)

We analyzed data by Mann Whitney test and significance level considered as 0.05.
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Students were asked at the end to state their viewpoints about the appropriateness of pediatric course trainings for achieving necessary skills of managing patients outside the hospital. The most important viewpoints in control group were: 1.Inappropriateness of trainings with educational needs (100% of students) and 2. Unnecessary specialized trainings (70% of students). Intervention group were asked the same questions, 16 students (89%) mentioned that specialized training were not necessary, they obviously considered IMCI useful and practical, they also wanted increased training workshops and clinical trainings based on IMCI strategy.

**DISCUSSION**

As it was recognized in the results, IMCI strategy training has significantly increased pediatric interns knowledge and expertise scores about the management of the most common children illness. Several studies have shown insufficient clinical skills in general practitioners in Iran, for example Jolaei et al carried out a study on clinical skills of family general practitioners in Fars province in 2009. They concluded that general practitioners skills level for provision of health services have been low and needs various interventions for their promotion of skills (5).

Another study carried out by Mahram et al on general practitioners in health centers of Qazvin province in 2008 and showed that general practitioners lacked enough skills of 16 skills, out of 33 under investigation skills. They recommended developing consistent training programs of general practitioners skills by creating workshops (6). These results are compatible with our finding as in our study inappropriateness of trainings with educational needs were reported in 100% of control group.

Kebreyaei et al have investigated training services defects from the viewpoints of students of medical, health, midwifery, nursing, paramedical and dentistry colleges in 5 dimensions of accountability, commitment, empathy, concretely, and reliability in Zahedan, they concluded that most defect of training is related to training accountability dimensions (6). In another study that was conducted in hospitals affiliated with Kerman University of Medical Sciences on 303 externship, internship and residency students, it was reported that maximum quality gap of clinical educational services both in view of internship students and residents was in responsiveness dimension (7).

| Table 1. Comparison of grade point average between control and intervention group |
|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| **Group**       | **Number**     | **Percent**     | **Male/Female** | **Age Mean Range** | **Mean Rank of Total Grade Point Average** | **P Value** |
| Control         | 19             | 100%            | 12/7            | 24.3            | 23-27            | 17.63            | 0.429           |
| Intervention    | 18             | 100%            | 15/3            | 24.6            | 23-28            | 20.11            |                |

Based on Mann Whitney test we did not observe any significant statistical difference between mean rank of total grade point average between two groups

| Table 2. Comparison of knowledge means rank of score in 3 parts about the most common childhood illness between control and intervention group |
|-----------------|----------------|----------------|-----------------|-----------------|-----------------|-----------------|
| **Group**       | **Number**     | **Percent**     | **Mean Rank of Score** | **P value** |
| Diagnosis and Classification | Control | 19 | 100% | 12.24 | <0.001 |
| | Intervention | 18 | 100% | 26.14 |         |
| Treatment Choice | Control | 19 | 100% | 11.95 | <0.001 |
| | Intervention | 18 | 100% | 26.14 |         |
| Nutritional Recommendation and Growth Monitoring | Control | 19 | 100% | 13.16 | <0.001 |
| | Intervention | 18 | 100% | 25.17 |         |

Based on Mann Whitney test there was significant statistical difference between students mean rank scores in control and intervention groups

| Table 3. Comparison of Skill means rank of score in management of the most common childhood illness between control and intervention group |
|-----------------|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| **Group**       | **Number**     | **Percent**     | **Mean Rank of Score** | **P value** |
| Control         | 19             | 100%            | 10.63            | <0.001          |
| Intervention    | 18             | 100%            | 27.83            |                |

Based on Mann Whitney test mean rank of students skills scores of managing children dangerous signs was significantly higher in intervention group than control group
Another study on graduated medical students in Kerman university of medical sciences in 2013 has shown according to, self assessment, confidence for some important capabilities like radiography request and interpreting was undesirable and toward achievement expected competencies; it is necessary to modify educational methods (8). In a similar study Aghamolaei in university of Hormozgan between 2006-2007 assessed training service quality of medical, midwifery, nursing, health and paramedical colleges students, it was recognized that most defect of training quality was also related to accountability dimension for them(9). Results of these four recent studies corresponded to the results of our study poll. As we found most of students both in control and intervention groups mentioned that specialized training were not necessary and emphasized on more practical education according to real educational needs. Shirazy et al carried out a study at university of Tehran in 2009-2011 and evaluated needs and training methods of general practitioners from their viewpoints. Training needs based on ten priorities of questionnaire had demonstrated clinical pharmacology, pediatric and internal emergency, skin diseases, poisonings, surgical emergencies, trauma, burn, CPR, medical laws, forensic medicine, myocardial infarction, first aids and child psychiatry, respectively(10). This study also obviously emphasizes pediatric emergency importance. 54.3% of general practitioners stated in the study of Karimi et al in Yazd province in 2011, that there is a great gap between theoretical learning of students and what they are expected to do in family general practitioner plan, they also considered revision of general practitioners training subjects a must (11). This study is compatible with our results. Efficacy of IMCI education on improvement of clinical skills in health services and also on reduction of under five mortality rate have been showed in different studies; Armstrong Schellenberg et al examined implementation of IMCI on improvement of health services to children under 5 years old in Tanzania. They recommended that this strategy is executable in countries with limited resources easily, it improves provision of health services for children and its result can distinguished very fast by increasing in survival and improvement children health (12). The same researcher during 1992-2002 concluded that executing IMCI causes mortality decrease of children (13%); they also introduced IMCI as an affordable method which has the capacity to be used for health facilities (13).

Furthermore, El Afreen et al in Bangladesh in 2004 compared results of implementing IMCI with a group receiving standard cares in a randomized study, after 2 years of evaluation they concluded that the mean index of proper treatment of children was 54 in IMCI group contrasted to 9 in group receiving standard services (0-100 range). They also showed that executing IMCI improves provision of health services and increases using health facilities(14).

It was recognized in the study of Joao Amaral et al that executing IMCI for children who are 2 months to 5 years old to increase the skill of medical and health services providers for diagnosis, classification and proper treatment of children illnesses more than untrained ones significantly (15). Also M Chopra et al examined the implementation of IMCI on children cares quality in north Africa between 2001 and 2002, they showed that health care workers skills at assessing dangerous signs of ill children, proper classification of illnesses, proper treatment selection and medical counseling has improved significantly compared to pre-intervention (16).

Regardless some differences in details of several above studies in Iran, almost all of them concluded that we should find a solution to fill the gap between ordinary educational methods and real medical needs for general practitioners. Importance of accountability of medical education have emphasized in most of above studies in Iran. Effectiveness of education and implementation of IMCI in child health improvement have been approved in many studies as mentioned above. IMCI strategy have recommended strongly by World Health Organization, especially in developing countries (1)

Our study result emphasized the revision need of training plans in pediatric course and showed IMCI training can be a good intervention in clinical skill improvement for medical students. Small sample size in our study was a limitation and study on more students and even in different universities can give us more reliable results.

Integration of IMCI education in pediatric course can be logical method for improvement of training programs quality of this ward. It aims to promote knowledge and awareness of general practitioners related to managing the most common complaints of children. It seems also necessary to carry out more studies to find more effective training strategies either in pediatric wards or other clinical wards for medical students.

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