Abstract: The purpose of this study was to evaluate the quality of medical care and the status of radiological practice and equipment performance according to the protocols established by International Atomic Energy Agency (IAEA), in mammography divisions of Shiraz, Iran. In addition, a review of the literature is also presented. Five diagnostic mammography divisions, namely; Namazi, Faghihi, Hafez, Zeinabieh, and MRI were studied. Protocol related to staff and health physicist duties was investigated by arranging a standard questionnaire. Results showed that, approximately 47% of the staff had not passed necessary training in radiation protection and quality assurance radiation program in the beginning of their work. Moreover, about 80% of them had not their licenses renewed by attending the training classes again. More attention should be given to training and protection of the staff and quality control of the mammography machines and equipments.

Keywords: Mammography, medical care, radiography
divisions, stressing the importance of implementing it as a routine and preventive measure for early diagnosis of breast cancer [1, 26].

The aim of this study was to investigate the quality of medical care according to the radiation protection protocols established by IAEA in mammography division in Shiraz, Iran. In addition, a review of the literature is also presented.

2. Materials & methods

A questionnaire-based study was carried out in 5 diagnostic mammography divisions of Shiraz namely Namazi, Faghihi, Hafez, Zeinabieh, and MRI. A total of 30 women staff were interviewed between February 2008 to March 2008. All them were asked to participate in the study. Refusal rate to participate was very low.

The above mentioned questionnaire consisted 6 main categories. First, the audience were asked about radiation dose measurement units. The second part questions were about the Annual Maximum Permissible Dose (AMPD) [8, 9], the necessary training in regards to the procedures and quality assurance and radiation program in the beginning of the work made the third and fourth ones. The fifth part of the questions was about renewing the licenses. Moreover, the last question was about the status of film badge service. Then the questionnaires were reviewed for information quality and legitimacy, and corrections were made as needed. After reviewing the questionnaires, statistical analysis was performed using SPSS software (Version 10) by descriptive statistics.

3. Results

We found that in mammography divisions in Shiraz, 47% of the staff had not passed necessary training in regards to the procedures nor quality assurance and radiation program in the beginning of their work. About 80% of personnel had not their licenses renewed by attending the training classes again. Moreover, 80% of the machinery and equipments were not being regulated nor monitored as often as needed (Figure 1). Most of the radiation workers were aware of radiation dose measurement units and AMPD (> 95%). The status of personnel's Satisfaction for film badge service is shown in figure 2. In addition, we found that in 80% of the divisions, there was no special radiation protection shield used for the patients.

4. Discussion

Breast cancer is the second most common neoplasia and the first leading cause of cancer death among women in the world [27-29]. The primary factors that increase risk of breast cancer in women include certain inherited genetic mutations, a personal or family history of breast cancer, and biopsy-confirmed hyperplasia [30-33]. Other factors that increase breast cancer risks include a long menstrual history, obesity after menopause, recent use of oral contraceptives, postmenopausal hormone therapy, nulliparity or having the first child after age of 30, ethnicity characteristics, exposure to radiation, or consumption of one or more alcoholic beverages per day [34-45]. Factors that decrease breast cancer risks include breastfeeding, physical activity, and the maintenance of a healthy body weight [34]. Unfortunately, many women lack access to all this information [46-52]. Mammography, Clinical breast examination (CBE) and breast self-examination (BSE) are the secondary preventive methods used for investigation in the early detection of breast cancer [53-55]. Cancer detection investigations therefore play a pivotal role in reducing breast cancer related mortalities [56]. The American Cancer Society [30] recommends CBE and mammography in the early detection of breast cancer [57]. According to ACS recommendations, women should know how their breasts normally feel and report any breast changes promptly to their health care providers [58-62]. BSE is an option for women starting from the early 20s...
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perform regular breast examinations.
that she is susceptible to breast cancer and that breast
According to this therefore, a woman who perceives
associated with his or her action to reduce that threat.
posed by a health problem and by the value
influenced by a person’s perception of the threat
The model stipulates that health-related behavior is
applications including breast cancer investigations.
The Health Belief Model (HBM) originally introduced in
Secginli’s study performed in Istanbul [75]. The
recommendation practice was 12.6 % in
women over the age of 40 having a professional
breast examination every year was 21.1% in the
eastern region of Turkey [70]. Annual mammography
is considered the most valuable tool for detecting
breast cancer in the earliest possible stages, before
the cancer has metastasized and when interventions
are most effective, least invasive and debilitating [71-
74]. The decline in breast cancer mortality has been
largely attributed to regular mammography
investigations. The rate of undergoing a
recommended mammography practice was 12.6 % in
Secginli’s study performed in Istanbul [75]. The
Health Belief Model (HBM) originally introduced in
the 1950s has been widely used in health behavior
applications including breast cancer investigations.
The model stipulates that health-related behavior is
influenced by a person’s perception of the threat
posed by a health problem and by the value
associated with his or her action to reduce that threat.
According to this therefore, a woman who perceives
that she is susceptible to breast cancer and that breast
cancer is a serious disease would be more likely to
perform regular breast examinations.

Despite breast cancer being one of the few
cancers that can be detected early before seeing
symptoms using mammography, mammography is
still only performed on a low proportion of the
women population in Iran. Despite the wealth of
literature available globally documenting knowledge,
attitudes and practices of women about breast cancer
and mammography, there is still paucity of literature
on the Middle East experience in this area. The
aforementioned gaps form the basis of the present
study. Hindrances to accessing mammography
services not only in Iran or Middle East, but also
globally should be identified and then health care
authorities should establish strategies to overcome
them.

The aim of mammography is to obtain a
high-quality image from breast with the least
exposure of the patient [8, 9, 76]. Therefore, along
with an increase in the diagnostic application of X-
ray, more consideration should be given to radiation
protection protocols [24, 25, 76, 77].

Results of our study showed that
approximately 50% of the staff had not passed
necessary training in the beginning of their work.
This means increased risk for patients. This study
showed that an adequate training of staff in
mammography divisions was required to reduce the
patient's radiation dose. Implementation of radiation
protection courses and education of practical issues,
including radiation dose received by patients and
radiation safety, during medical education programs
could be an effective method to reduce the patient's
dose in medical exposures.

In some countries radiological safety
courses are offered to staff in order to decrease the
patient risk, but it was also demonstrated that these
educational courses were not enough [78]. Pre-
evaluation of all the requests for mammography is
not a practical solution for overburdened radiology
departments.

We found that the knowledge about
radiation dose measurement units, as well as the
AMPD was found to be ideal (> 95%).

To the best of our knowledge, this is the first
study in Iran to investigate radiation protection
observance in mammography staff, and our findings
are similar to other studies in the literature [1, 65,
79]. In Brazil Marinho et al, evaluated knowledge,
attitude and practice related to mammography among
women users of local health services. Their results
showed that only 7.4% of the interviewees had
adequate knowledge on mammography, while 97.1%
of women had an adequate attitude. In addition, they
reported the same value, for the practice of
mammography that was adequate in 35.7% of the
cases.

In our study, the interviewed staffs were
from five different divisions in Shiraz. Therefore, our
results may not apply throughout the Iran, but it does
seem that most divisions have the same problems.
This lack of awareness becomes particularly pertinent
when we consider the number of staff who receive
inappropriate training. Further investigation in other
parishes of Iran is suggested. Combined to the data of
the present study, both could provide better
understanding of the existing status of radiological
practice and equipment performance in
mammography divisions [5, 7, 55, 80].

Majority of the women frequently practiced
BSE and occasionally sought for CBE, but did not go
for mammography. It is thought that BSE makes
women more aware of their breasts which in turn
may lead to an earlier diagnosis of breast cancer. The
rationale behind extending BSE practice as a screening test is the fact that breast cancer is frequently detected by women themselves without any other symptoms. A meta-analysis of studies investigating the possible benefits of BSE has shown that regular practice increases the probability of detecting breast cancer at an early stage. This study revealed the finding that many participants had practiced BSE. Most of the women in this study were from diverse backgrounds and mainly from lower social status. This means that these women may not have ready access to mammography and CBE. In their study, Siahpush & Singh also reported a similar finding with women from non-metropolitan backgrounds [81]. ACS no longer recommends BSE (30). However, in developing societies like Iran, BSE should still be encouraged because access to CBE and most importantly mammography is extremely limited. Some health facilities are not easily accessible and mammography is very expensive for the majority, yet BSE can still help to some extent.

There may be several reasons for not undergoing mammography. The cost of mammography in Iran and probably globally is high, particularly for a woman who does not have social security like most of the participants in this study. Although some authors have reported factors like mammography-induced pain and discomfort plus the effects of the radiation received during a mammogram, as a barrier, this cannot apply to this study as all the women interviewed had not undergone any single mammogram [14, 82]. This means that there is something more than pain or the fear of radiation that hinders these women from seeking mammography. The lack of information about mammography and the high costs for the few who know about it may be the biggest hindering factors especially in low-resourced settings. Focused educational programs are urgently needed to address this issue. Programs for women, especially those who have low education levels, do not work and spend most of their time at home, should be encouraged. For this purpose, the media (local written and oral, radio, television, soap operas, newspapers etc.) could be used [48, 52, 83]. Through such programs, awareness of breast cancer, the importance of its early diagnosis, and prompt treatment can significantly increase.

5. Conclusion

In this study, the existing status of medical care according to the IAEA protocols in mammography divisions was investigated. More regular checks on the subdivisions must be made from the Atomic Energy Organization of Iran and more attention should be given to training the personnel, protection of the personnel and patients, and quality control of the machines.

Acknowledgements:
The authors wish to acknowledge the research board in Nuclear Science, Tabesh Research Center, Shiraz University, Shiraz, Iran for their critical technical support and advice.

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