

The Role of Nursing Awareness in the Use of Diagnostic Radiology of Cancer

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ABSTRACT:Cancer will include death and recurrence of the disease in the coming decades. Radiography is one of the most important diagnostic methods in cancer that effective use of this technology is possible only under specific and organized methods. Due to the use of various methods of imaging in the diagnosis and treatment of cancer and the nurse's role in preparing earlier and lack of knowledge of nurses in this study systematic review of diagnostic methods used in cancer It was done in Iran.All internal studies performed during 2008-2019 using the keywords cancer, cancer of Iran, cancer test, cancer radiology, chemotherapy, and cancer medical imaging of Iranian databases including Mag Iran, SID, Medlib, Iran medex and Other Iranian journals approved by the Ministry of Health were reviewed and data were analyzed using a meta-analysis method.Thirty-four studies were reviewed to evaluate the diagnostic test used in tumors. The types of diagnostic methods were categorized into 9 domains and were as follows: Ultrasound, Combined Methods, Novel Modeling (Bioinformatics), Plasmonic Sensors, Electrochemical and Optical Sensors, Thermal Imaging, Magnetic Resonance Imaging, Molecular Imaging.Training in the areas of new methods of diagnosis is essential and in this regard, more attention universities and institutions to this issue, and likely courses of training and retraining for staff certainly greatly help in achieving this goal will do.

KEYWORDS: Radiology, Cancer, Medical Imaging.

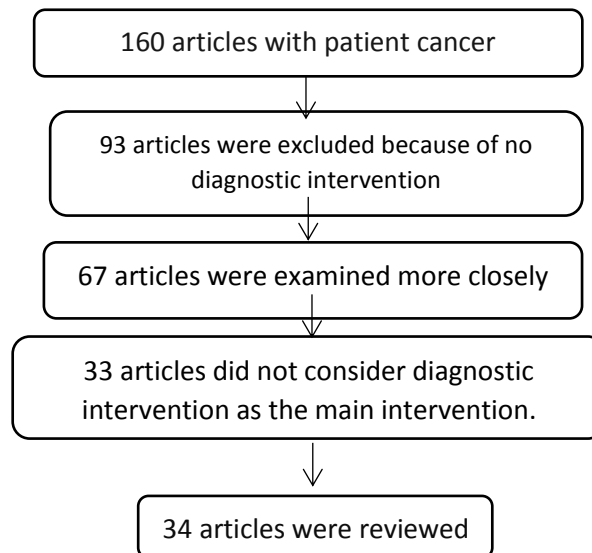
I. INTRODUCTION

There are currently 20 million people living with cancer worldwide, which is likely to reach over 30 million annually in 2020 (1), including my deaths and future home births in the coming decades. It was. At present, about 13% of all deaths are all over the world, and about 60% of them die without attention (2). Studies show that the survival rate of cancer patients up to five years after diagnosis was 88% and ten years after diagnosis 80% (3) Pathological studies have also shown that more than 80% of malignancies are benign in the early stages (4), so early detection of cancer and effective treatment and special strategies can help increase survival, reduce mortality and improve the quality of life of patients. On the other hand, the accuracy and speed of cancer diagnosis depend significantly on the diagnostic tests used (5). Radiography is one of the most important diagnostic methods in cancer diagnostic and treatment services where effective use of this technology is possible only under specific and organized methods (6). In this regard, the role of nurses as the first link in the preparation of patients prior to imaging is important if the results are ignored and not observed and, most importantly, insufficiently familiar with the diagnostic tests themselves. In many cases it is worthless and useless and will require repetition resulting in increased exposure of staff and patients (7). Nurses' inattention and familiarity with the types of medical imaging and preparation and their associated complications in cancer can cause material losses including the loss of specialized human resources and high costs such as film, consumables, medications and Depreciation of expensive devices and on the other hand will lead to inaccurate and sometimes even misdiagnosis, increased radiation exposure, delayed diagnosis, resulting in inadequate patient treatment and poor outcomes (8). Due to the use of various methods of imaging in the diagnosis and treatment of cancer and the nurse's role in preparing earlier and lack of knowledge of nurses in this study systematic review of diagnostic methods used in cancer It was done in Iran.

Method: All internal studies performed during 2008-2010 using the keywords cancer, cancer of Iran, cancer test, cancer radiology, chemotherapy, and cancer medical imaging of Iranian databases including Mag Iran, SID, Medlib, Iran medex and Other Iranian journals approved by the Ministry of Health were reviewed and data were analyzed using a meta-analysis method and The data of the selected articles were collected. After reviewing and aggregating all the searched articles, duplicate and unrelated articles were removed. Subsequently, the articles that were considered for inclusion criteria were those: articles that examined a variety of diagnostic imaging modalities to identify cancer tumors. Exclusion criteria included case report data and There were posters, conferences, review articles, and descriptive-analytical studies in which they did not intervene to diagnose the disease. All ethical requirements regarding the correct use of the extracted articles and the rules for publication were respected.

II. FINDINGS

After searching the databases and extracting a large number of articles by title and abstract, 160 articles were reviewed, of which 93 were excluded because of no diagnostic intervention. Of these, 33 articles reviewed screening and therapeutic interventions as the main intervention in the study. Finally, 34 articles were included in this review.



Finally, a variety of diagnostic imaging methods were categorized into 9 domains and were as follows: Ultrasound, Combined Techniques, Novel Modeling (Bioinformatics) Methods, Plasmonic Sensors, Electrochemical & Optical, Thermal Imaging, Magnetic Resonance Imaging, Molecular Imaging.

III. DISCUSSION

Nine studies used ultrasound as the main diagnostic test or diagnostic aid to identify cancerous tissues (9–17). The results showed that ultrasound can help to differentiate between benign and malignant tumors but alone does not have high sensitivity and specificity for the diagnosis of cancer. Therefore, ultrasound as a complementary tool in the diagnosis of this disease is more useful and reliable. Seven studies used multiple simultaneous and complementary techniques. Two studies used ultrasound with data mining analysis (18,19) and four studies used mammography with image processing (23–20). One study also used a combination of ultrasound and mammography to diagnose cancer cells (24). The results indicated that complementary use of several methods could overlap the shortcomings of complementary methods and increase sensitivity and specificity of detection by 20 to 30%.

7 studies have used novel biomarker imaging modeling and imaging processing techniques to use a computer-based diagnostic tool to help clinicians to irregularly extract data, as well as possible errors due to fatigue or inexperience. Reduce the number of experts and provide the physician with the required medical data in less time and in greater detail. The use of data mining techniques has been the most accepted by local researchers in this field. Possible neural networks, artificial neural networks, microarrays and Cox regression were the algorithms used in imaging cancer cells. The results showed that the neural network performance is probably better in

detecting the type of cancer and stronger than the other techniques of data mining algorithm. In addition, the implemented network had faster speed in training and generalization process than similar cases (25-31).

Four studies tested sensors for early detection of cancer tumors in the plant (35-32). Plasmonic, electrochemical and optical sensors were the sensors used in these studies. Sensors are simulated in this study Because of the optical fiber and the damping of the few and the ability to simultaneously measure two of the three wavelengths resonant with three channels for a sample and the detection of the order of thousandths of a refractive index very early detection Successful mammary tumors. The achievement of 95.3% accuracy in the classification of the three cancerous, normal and benign groups were 93.7%, 85.7% and 100%, respectively, and predictive accuracy was 88.2%, 92.3% and 100%, respectively.

Four of these studies used thermal imaging to diagnose tumors. Thermal imaging using infrared was the most used by radiologists. This is a fast, non-invasive, non-invasive and flexible way to monitor human body temperature based on recording temperature distribution patterns of tissues. Thermography has been concluded as a very suitable method for early detection of cancer cells (36-39) compared to other methods due to non-invasive, non-contact, inactivation and non-use of ionizing radiation (36-39).

The two studies used magnetic resonance imaging to detect cancerous tumors (40, 41). One study examined molecular imaging for early detection of cancer. Organic nanoparticles such as liposomes, solid lipid nanoparticles, aptamers, dendrimers, and nanoparticles were used to carry the drug and various ligands of the systems used in this study. Aptamers are oligonucleotide molecules and antibody nanoparticles that bind to the target protein or cell in this way and can be of particular use in the rapid diagnosis and treatment of tumors (42).

IV. CONCLUSION

The value of any diagnostic test depends on its ability to detect the presence of the disease in cases where it is susceptible and to identify the absence of the disease where it is not (specificity). It can be concluded that in spite of advances in diagnostic methods, most cancer patients still present at the mass stage (average size of 29 mm), although the process of progression towards cancer has been established for many years before the formation of the mass. This is completely inconsistent with the goals of early detection at the micro-calcification stage. What can be concluded from this study is that attention to new diagnostic systems in medical science by nurses can overcome the difficulties in these methods. Using these modern techniques, new systems can be designed to help physicians simplify and precise the diagnostic process and reduce unnecessary costs. It is said that training in the areas of new diagnostic methods seems necessary. In this regard, the greater interest of the universities and institutions concerned in this regard, and possibly in-service training and retraining for staff, certainly contributed to this end.

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