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CONTENTS

CANCER AND CAM (COMPLEMENTARY AND ALTERNATIVE MEDICINE) PARADOX

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Herbal therapy or phyto therapy have been commonly used to treat patients with herbs for thousands of years around the world particularly in such regions as Anatolia and China. Herbal drugs are believed to be useful and harmless among the public. The interaction of herbal products and cancer drugs is a big problem encountered during cancer treatment and its effects are not well-known. Cancer treatment is important and must not be interrupted. In this review, we discussed the paradox of the interaction of herbal products and cancer drugs in the light of experimental and epidemiological evidences as well as the impact of online news regarding the herbal medicines for cancer treatment.

***Keywords**: Cancer, Phytotherapy,Paradox, alternative medicine*

1. INTRODUCTION

In our society, cancer is a disease constantly believed to require a miracle and feared to result in death and thus attempted to be cured by Folk Therapy or natural methods like "honey miracle" on TV channels. Its historical progress shows that the first evidences of cancer cases date back to Edwin Smith papyrus and mummies in Egyptfrom 3000s B.C, but the term cancer used for "unhealed" structures was first described by Hippocrates in 300s B.C. Approximately 500 years after Hippocrates who named the painful, ulcer-forming red tumors "carcinos" or "carcinoma", Galen named these tumors "cancer" as he likened them to crabs [1] In physiological sense, cancer is the uncontrollable growth of a cell which has the capacity to divide a specific number of times in its lifetime, and the accumulation of such cells to form tumoral masses. Primary carcinogenic factors are smoking and alcohol consumption, viral diseases, sunlight, chemical substances and air pollution and malnutrition.With respect to the principle "there are no diseases, there are patients", many types of cancer are present and each of them grows at different rates and requires different treatment methods [2]

1.1. Complementary and Alternative Medicine (CAM) Methods in Cancer Treatment

Many treatment methods outside modern and scientific treatments are generally known as Complementary and Alternative Medicine (CAM) methods. Although cancer treatment is considered anunending road among the public, many cancer types can be almost fully cured in early stages with

cancer treatment in modern medicine. Nevertheless, especially complementary therapy plays an important role in cancer treatment [3]

More than 200 Complementary Therapy methods are classified into five categories by the National Center for Complementary and Alternative Health (NCCAH) [3,4]

1. Alternative and medical system (traditional Chinese medicine including acupuncture and qigong, homeopathy, ayurveda)
2. Body-mind therapy (bio-feedback, hypnosis, relaxation/meditation, music, imagery, prayer/spirituality)
3. Biologically based therapies (herbal therapy, high-dose vitamins, special diets)
4. Energy therapies (therapeutic touch, reiki)
5. Manipulative and body-based therapies (massage, exercise, chiropractic, hydrotherapy, reflexology, acupressure)

Although Complementary and Alternative Therapy methods are used interchangeably, Alternative Therapies are used as a standalone treatment in cancer treatment while Complementary Therapies are used as an add-on or complementary therapy to cancer treatment [3]

1.2. Biologically Based Cancer Treatment from CAM Methods,Phytotherapy

Treatment with plants, or phytotherapy, is made up of the words "plant" and "treatment" [5] Phytotherapy contributed to the drug development by minimizing the side effects after the development of basic medical sciences such as chemistry and biochemistry, and thus the increase in pharmacological and experimental studies in the historical process. In 1650s, in his grand medical book named "el-Kânûnfi't-Tıbb (Canon of Medicine) which is regarded as a reference book, Avicenna described the systematic classification of diseases and drugs, administration methods of drugs and the drugs of plant, animal and mineral origin, and mentioned phytotherapy in disease treatment. Although not standardized, about 650 of more than 12,000 species and sub-species,1251 types and 74 families of herbs grown in Turkey (many herbs such as mint, thyme, sage, bayleaf, cumin, aniseed, lime flower, fennel seed, rock cherry, rhus and juniper bark are exported) have been used in folk medicine for years [5,6] In fact, 25% of many substances we use as drugs are of plant origin. The treatment method employed for years by using herb parts has today transformed into "Contemporary Phytotherapy" that describes the transition from herbal treatment to herbal drugs. Due to the difficulty and costliness of cancer treatment and its side effects that cause health discomfort, there is an increasing tendency to apply natural products and herbal treatment or phytotherapy that dates back to ancient civilizations like Sumerian Civilization founded in Mesopotamia [5,6,7] Phytopharmaceutics and Phytotherapeutics are in a certain pharmaceutical form and have the same meaning and content and are orally administered herbal drugs. However, scientific studies about herbal drugs prepared from phytotherapeutics are not as sufficient as phytopharmaceutic studies. Therefore, the use of phytotherapeutics is based on traditional treatment methods and allowed only for minor indications. As herbal drugs are recommended for mild infections, it will be more acceptable to use the term Complementary Therapy rather than Alternative Therapy [5,6]

2. DISCUSSION

Today, reactions against the use of synthetic drugs due to their severe side effects as well as medical and financial problems raised the interest in Medical and Aromatic herbs again. Herbs containing thousands of phytochemicals such as essential oils, capsaicins, tannic substances, minerals, glycosides, alkaloids, saponins, flavonoids and vitamins are commonly used against diseases ranging from simple disorders like cold to severe diseases such as cardiac disorders, diabetes, rheumatic disorders and cancer [5,8,9,10] According to World Health Organization, around 50% of the world population benefited from traditional medical methods by using many kinds of herbs in 2000. Moreover, many people prefer herbs to medical drugs because herbs are deemed safer as they are obtained by natural methods. They consider herbal drugs as an alternative to medical treatment. In African and Asian countries where access to physicians and drugs is difficult, herbal treatment is more commonly practiced than medical treatment. In the USA, on the other hand, herbal drugs are regarded as nutritional supplements or nutraceuticals and have not been controlled by FDA until recent years.Thus, the use of herbal drugs have become uncontrollably widespread in Turkey and in the world [5,11] For stomach-aches that may be caused by various factors from a simple spasm pain to intestinal obstruction, drinking mint and lemon tea before seeing a doctor displays the prevalence of natural methods among the public. Many people believe that all natural herbs and foods are safe. Therefore, they do not consider that taking these natural plants and foods as a supplement to the treatment can be wrong in cancer disease as they believe to be facing death. However, these herbs and foods may interact with drugs taken during medical treatment, thereby causing severe side effects. Specialists take this into account and state that naturality does not necessarily mean full safety [12]

Contrary to the recommendations of authorities regarding the use of herbal products in simple diseases, they are mostly used in chronic cases such as asthma, hepatic diseases, HIV, rheumatic disorders and breast cancer. In addition to their prevalence among the public, the use of herbal treatment methods is also common and acceptable in healthcare communities as indicated by the fact that 40% of the drugs marketed from 1983 to 1993 were of plant origin and constituted 50% of the prescribed drugs according to the study of National Cancer Institute for "Effective Treatment In Cancer" in the USA, a licensed herbal drug ranked 7th among the most-prescribed drugs in Germany, and the practice of physician-based herbal treatments increased in health websites [11,13] In a study with cancer patients, it was found that 63% of the patients used either complementary or alternative therapy methods at least once [14] As a result of increasing fear due to feeling threatened by cancer and the adverse effects of chemical drugs taken, complementary medical methods continue to be practiced by the patients.

2.1. Phytotherapy Practice in Cancer and Impact of Media

Due to the interest of medical doctors in phytotherapy, the despair of cancer patients and their relatives, the adverse effects observed during chemotherapy, the news regarding cure-all type drugs in the media and the skilful natural product sales representatives, orientation to healers and herbalists have increased. In internet search, the phrase "Herbal Therapy in Cancer" gives 382,000 results. Most of these websites contain articles about cancer treatments and the harms of chemotherapy written by people including specialists and general practitioners, dieticians, herbalists, phytotherapists, sales representatives, foreign healers and uneducated salespeople who market the herbal mixes they prepare in their villages. In these websites, some herbs are occasionally featured and herbal mixes such as

extracts, pastes, capsules, syrups or elixirs prepared from these herbs are marketed without the control of Ministry of Health. Due to the news on media trying to convince people that herbal products have supernatural effects and treatment with these products causes less side effects as compared to chemotherapy, sufficient data are not available about food supplements prepared by non-pharmacological methods, their uncontrolled sale, why and how much they are used and whether they lead to dangerous side effects or not.

There are various information and instructions in the websites described as media. For example, following statement that may affect the chemotherapy process was encountered in a website: "I object to the practice of chemotherapy in cancer patients. Insisting to apply a treatment method that leads to so many side effects is against my understanding of being a doctor." In the same website, it is also commented: "No, you are not a cancer patient. You are just diagnosed with a mass in your pancreas. So what is recommended to you for this disease that has not progressed yet? Treatments that will destroy your immune system." [15]

In another online blog, a herb is introduced together with its picture and the comment: "My mother's cancer that had advanced to a degree where medical solution was impossible directed us to alternative medicine. Just then, with a little research I reached this miraculous information. Thanks to this cancer weed (Figure 1), she overcame throat cancer when she was on the eve of death." [16]

Figure 1.Cancer weed

In the website of a newspaper, it is claimed: "While applying chemotherapy to our patient suffering from soft tissue sarcomas with methastatic spread to lungs, the cancer spread to the brain as well. To the patient's chemotherapy treatment, I also added phytotherapy that I use especially in the cases of spread to brain, and the mass in the brain disappeared in the 4th month of phytotherapy." [17]

In a woman-oriented website, a post claims "Incredible plant 100 times more effective than chemotherapy: dandelion" and emphasizes that this plant is a remedy for cancer [18] .

In another online blog, it reads: "Hello, dear being. You found out today that you have cancer. You seek medical treatment, it is your choice. Cancer is not a disease; therefore all the medical methods are violence-based" [19]. Sometimes referring to the food we consume daily, it is also claimed that some vitamins terminate cancer: "Most of the time, chemotherapy itself is carcinogenic. High doses of vitamin C are poisonous especially for cancer cells. This is what chemotherapy does

too, but vitamin C does not damage healthy cells, cause nausea and hair loss. They only help recover" [20].

And sometimes medical methods are claimed to be completely harmful and patients are directed to alternative methods. "Put an end to cancer with the drug X. Chemotherapy is poison. Chemotherapy is not a treatment, it is death sentence. I have been investigating the effects of the drug X for 20 years and I admire it. I admire this water of life given by Jesus to humans. The drug X guarantees you 100% survival after 6 months of treatment, while medical practices guarantee average 5% survival" [19].

Commonly addressed topics in these websites are as follows:

- Cancer not being a disease;
- Cancer patients' lack of belief in chemotherapy;
- Instinct of the patient relatives to help and find a new treatment method;
- Capability of salesmen to market their product even for once;
- Belief in the harmlessness of therapies with herbs collected from nature;
- Supernatural effect of herbal therapy against cancer;
- Patients and patient relatives relying on news for advertisement purposes rather than medical news;
- Belief that patients are used as subjects for cancer drug studies.

Side effects observed as a result of these herbalist drugs which are claimed to be produced by natural means and used without control during chemotherapy affect the patient's health negatively. Herbal products recommended innocently instead of cancer drugs produced after years of drug development studies costing millions of dollars and introduced to the market may sometimes worsen the disease. The interaction between drugs and herbal products which are easily accessible in Turkey and many other countries in the form of extracts is not well known yet. Furthermore, as they are not standardized, there is no sufficient scientific infrastructure and database regarding the life, side effects and other pharmacological characteristics of herbal products [11]. Many studies are conducted to confirm that the substances of plant origin known to be antioxidants against cancer for years have positive effects in ceasing the growth of cancer cells. Nevertheless, it is not possible to reach a final and definite conclusion regarding the effects and drug interactions of these antioxidants of plant origin. In a study, in case of the intake of exogenously-administered drugs such as quercetin, gallic acid and catechin which are known to have good antioxidant activity in high doses and especially in the presence of metal ions, these antioxidant substances were observed to show pro-oxidant activity and cause cell death and DNA damage in high concentrations [21].

The interaction between drugs and herbal groups causes severe side effects, and the most important drug group that may interact with herbal products is anti-cancer drugs as herbs may hinder cancer treatment. In addition to severe side effects during the concomitant use of herbs and drugs, they also cause toxicity and negatively affect body systems. Drugs used in cancer treatment such as irinotecan and imatinib interact with herbs as well. If the herb St. John's Wort (Hypericumperforatum) is taken during chemotherapy, it induces CYP3A4 which is one of the Cytochrome P450 system enzymes metabolizing the drugs in the liver (because CYP3A4 is also a substrate of chemotherapy drugs such as cyclosporine) and leads to a decrease in the concentration of cyclosporine administered. Echinacea inhibits CYP3A4 and increases the concentration of drugs such as cyclosporine. Grapefruit and St. John's wort are also known to interact with drugs metabolized by the Cytochrome P450 enzyme system. When ginseng is used with hormonal treatment, it has estrogenic activity. As it may

increase estrogen and cause estrogen-associated vaginal bleeding and thromboembolism in breast cancer patients, the use of ginseng is definitely not recommended in concomitant with hormonal treatment [12,22,23,24] Cases of hepatic insufficiency associated with the use of Ganoderma Lucidum (Reishi) resulting with death were reported in medical literature. It acts on hepatic cytochrome enzymes and reduces the effects of anti-nausea drugs, thus it is definitely not recommended during chemotherapy [25] Many patients tend to buy herbal products marketed through TV and internet ads due to the fear of death or the desire to stay alive longer; they hide from their doctors the fact that they use such herbal products or associate the side effects with chemotherapy drugs and do not report them. From this aspect, it is difficult to detect the extent of herb-drug interactions [11,22].

In 2001, the likelihood of herb-drug interaction was determined according to a scale developed by Fugh-Berman and Ernst for the likelihood of herb-drug interaction. The likelihood of herb-drug interaction is assessed by using a 10-point scale consisting of 10 criteria where each item is given 1 point. According to this scale, 10 criteria includes the following: Herbs used with the drugs are well-understood and their time and dose are known; their chronology is completed; their side effects are accurately and clearly identified; observation duration of the side effects of the drug; the end of interaction following discontinuation of the drug and whether side effects recur as a result of re-exposure. Results with 8-10 points are assessed as "most likely", results with 4-7 points as "likely" and results with 0-3 as "interaction unlikely" [22]. We must have sufficient information regarding both the drug administration and the chemical properties of the herb. To assess this interaction is not always possible; therefore influential people in oncology approached herbal therapies with suspicion and encountered severe side effects that were thought to occur as a result of the common use of these products, and had to change their treatment methods or interrupt the patient's treatment. It is stated by oncology authorities that beta-caroten which has proven antioxidant activity facilitates lung cancer instead of preventing it in smoking people; antioxidants may reduce the effect of chemotherapy and radiotherapy;vitamin and mineral-mixed drugs may be harmful to cancer patients with bone metastase; overuse of garlic may decrease the efficiency of chemotherapy when taken with a blood-thinning drug called Coumadin; Gingko biloba and stinging netle may cause bleeding and mix with the side effects of chemotherapy; the herb Echinacea may decrease the efficiency of such drugs asolantaxol, vincristine, vinblastine,tarceva, irinotecan,cyclophosphamide, etoposide metabolized in the liver, therefore such herbs must not be taken with chemotherapy [25,26] It was demonstrated in a study that, in the event of interaction of a drug called Tamoxifen and the drug substance "genistein" found in soy and known to be a phytoestrogen,genistein inhibited the therapeutic effect of tamoxifen in a postmenopausal breast cancer model [27] It is also stated that even major healthcare organizations have difficulty in controlling these products, and toxic substances may have mixed in such herbs and thereby causing severe bleeding and death cases [5] In the final declaration of biennial Symposium on Medicinal and Aromatic Plants, it was emphasized that different studies were conducted on these herbs in different disciplines and the herbal drugs that only pharmacists are authorized to make should be standardized [28] Whether in Chinese Medicine, in Indian Medicine or in Traditional Herbal Medicine practiced in Anatolia, it is a fact that these therapies are common and used without control among the public and interrupt the medical treatments. Prevalence of herbal treatments and introduction of many herbal therapies into pharmacopeias on one hand, and interruption of cancer

treatments and occurrence of severe side effects as a result of uncontrolled herbal therapies on the other hand show the phytotherapy paradox in cancer.

3. CONCLUSION

With regard to Contemporary Phytotherapy or European Herbal Therapy practiced in compliance with Modern Medical System, European countries published monographs containing the characteristics of herbal products such as chemical formula, activity, dosage, indications and contraindications, and started to manufacture the herbal drugs in accordance with Good Manufacturing Practices (GMP)rules [11] .However, in Turkey where folk medicine has carried on as a tradition since ancient times, deficiencies are observed regarding phytotherapy due to the marketing of the products by uneducated people, the effects of the herbal products, their interaction with other drugs, lack of follow-up in terms of price and activity, lack of control of the products imported from countries like China and India in terms of quality, abundance of companies trying to sell these products to helpless cancer patients etc. In order to ensure the safety of phytotherapy in traditional medicine especially in disadvantaged cancer patients, side effects, toxic effects and drug interactions of these herbs should be chemically and pharmacologicallyunveiled in a much clearer manner.

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OPINIONS OF HEALTH WORKERS ABOUT WORK PLACE: AN EXAMPLE OF BISMIL PUBLIC HOSPITAL

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This study aimed to investigate opinions of health workers about work place on behalf of workers' rights, occupational safety and relations with administration in a public hospital. Data were gained from 93 health workers working in a district of Diyarbakır , Bismil Public Hospital. A survey was conducted among health staff face to face and obtained data were analyzed by SPSS 15.0 package program. Findings showed that 34,4% of participants were between age of 26-30, 49,5% were female and 83,9% were married. While 53,8% of health staff expressed that they were able to report their problems to hospital management, 6,5% of them stated that directory of hospital didn't mind problems of workers. 44,1% of health staff stated that hospital management didn't take enough measures in order to provide safety at work. It was also found that 78,5% of participants were satisfied with trainings for vision and quality of hospital but 33,6% were unsatisfied with trainings for reporting workplace violence in the hospital. 74,2% expressed that employees were not awarded frequently in the hospital. It was found that there was a negative relationship between age and satisfaction about management relations in the hospital (-,245, p<0,05). This may result from higher expectations of older workers. Also health workers having more work experience were not satisfied with management relations (,269, p<0,01).

Health workers who thought they were working in a safe workplace were more satisfied with management relations (,342, p<0,01). When relationship between work experience and satisfaction with definition of task was analyzed, a negative correlation was found (-,229, p<0,01). A positive correlation was found between effective use of human resources and precise task definition (,288, p<0,01). As a result it can be said that priority should be given to improve relationships between management and staffs. Employees should feel themselves as a part of the organization.

***Key Words:** Health services, health workers, hospital, job satisfaction*

1. INTRODUCTION

An organizations' efficiency and effectiveness is depends on the morale of its employees. Behavioral and social science research states that job satisfaction and job performance are correlated. As health workers service to patients their well-being in work environment is very important .

Job satisfaction is the degree to which individuals feel positive or negative about their jobs. It is an attitude or emotional response to one's duties as well as to the physical and social conditions of the work environment. Job satisfaction leads to positive employment relationships and high levels of individual job performance.In health istitutionsjob satisfaction will contribute to higher quality patient care and patient satisfaction [1,2].

According to Werner, job satisfaction has five facets, which can be put together to measure a job descriptive index (JDI) as follows [3]:

- ✓ The work itself – responsibility, interest, and growth
- ✓ Quality of supervision – technical help and social support
- ✓ Relationships with co-workers – social harmony and respect
- ✓ Promotion opportunities – chances for further advancement

Health istitutions are among most complex organizations structurally and functunally [4]. In recent years job satisfaction in health institutions became more of an issue[5]. Satisfied health worker equals satisfied patients [6].

Health workers want to feel themselves respected and trusted, while working in a safe environment with good pay and opportunities to advance. Satisfied staff will bring along success and high performance of institution and customer happiness [7]. Health institutions have a wide customer group waiting to be satisfied. Formerly "customers of health institutions "referred to patients but in recent times this definition changed into " all individuals and institutions participating in process of healthservices" [8]. Customers of health institutions may grouped by internal customer and external customer. While internal customers are individuals who work in health institutions, external customers are individuals or institutions who benefit from services of health institutions [9]. Within total quality management activities it is pointed out that satisfaction of external customers is possible as long as employees who are accepted as internal customer are satisfied with their job [7,10]. As all institutions, success of hospitals is related to its staff's success and performance [10]. In this study it is aimed to investigate opinions of health workers about work place regarding workers' rights, occupational safety and relations with administration.

2. METHOD

This study was carried out in a district of Diyarbakır, Turkey, Bismil Public Hospital. Among 216 health worker 93(43%) of them accepted to answer the survey. Formal permission was taken from directory of hospital. Job satisfaction of Health Staff Survey of Health Ministry of Turkey was taken as sample when conducting the survey. Surveys included two parts. Descriptive statistics ofparticipants constituted first part of survey. Second part included 31 questions about job satisfaction of participants. Survey was conducted face to face. Data were analyzed by SPSS 15.0 program. Percentages and frequencies were used in order to evaluate the results.

3. FINDINGS

Descriptive statistics of 93 halth workers were analyzed and results are reported in Table 1.

Table 1. Derscriptive Statistics of Health Workers

	n	%
Age		
18-25	17	18,3
26-30	32	34,4
31-35	24	25,8
36-40	5	5,4
41-45	9	9,7
46-50	5	5,4
50+	1	1,1
Gender		
Female	46	49,5
Male	47	50,5
Marital Status		
Married	78	83,9
Single	13	14
Divorced	2	2,2
Education		
High School	26	28
Vocational school	26	28
University	41	44,1
Profession		
Physician	14	15,1
Nurse	25	26,9
Medical assistant	19	20,4
Midwife	5	5,4
Administrative Personnel	30	32,2
Experience at work		
<1 year	12	12,9
1-2 years	19	20,4
3-5 years	29	31,2
6-10 years	24	25,8
11-15 years	4	4,3
+15 years	5	5,4
Total	93	100

Table 2. Opinions of Participants on workers'rights in the work place

	n	%
Do you work in the hospital overtime?		
Yes	37	39,8
No	56	60,2
Why do you work in the hospital overtime?		
Number of employees are inadequate	22	59,4
To get extra duty pay	9	24,3
To allocate time to the patients	1	2,8
Unsystematic organization of working hours	5	13,5
Do you think that human resources are used efficiently in your hospital?		
Strongly agree	21	22,6
Somewhat agree	41	44,1
Strongly disagree	31	33,3
Do you have a precisely described task definition in your work place?		
Yes	54	58,1
No	28	30,1
I don't know	11	11,8

According to Table 2 over half of participants(60,2%) stated that they didn't work in the hospital vertime. Most of employeesworker overtime indicated that the reason was adequate number of workers. The second reason was to get extra duty pay. To allocate time to patients and unsystematic organization of working hours were the other reasons. 77% of health workers thought that human resources were used efficiently. 58,1% of participants had a precisely described task definition.

Table 3. Opinions of Participants on occupational safety in the work place

	n	%
Do you think that your work environment is designed in order to protect your physical health?		
Strongly agree	13	14
Somewhat agree	53	57
Strongly disagree	27	29
Do you have technical facilities regarding occupational health in your work place?		
Strongly agree	28	30,1
Somewhat agree	34	36,6
Strongly disagree	31	33,3
Do you think that administration of your hospital take precautions regarding occupational safety?		
Strongly agree	27	29
Somewhat agree	41	44,1
Strongly disagree	25	26,9
Did anyone attack you physically in last 6 months?		
Yes	6	6,5
No	87	93,5
Do you think that administration of your hospital is performing efficient and preventive activities regarding occupational health?		
Strongly agree	19	20,4
Somewhat agree	54	58,1
Strongly disagree	20	21,5

It can be seen from Table 3 that 66% of participants found work place physically safe.

68% of employees stated that administration of the hospital took precautions regarding occupational safety. 73% of participants answered in the affirmative the question "Do you think that administration of your hospital is doing efficient and preventive activities regarding occupational health?"

Table 4. Opinions of Participants on relations with Administration of Hospital

	n	%
Did your administration organize an inservice training in last 6 months?		
Yes	77	82,8
No	16	17,2
Do you think that your administration organized adequate trainingsabout situations threatening patient and employee safety?		
Strongly agree	16	17,20
Somewhat agree	32	34,40
Strongly disagree	45	48,38
Do you have found an opportunity to report your problems to the management of hospital?		
Yes, always	50	53,8
Sometimes	39	41,9
Never	4	4,3
Do you think that hospital management takes care of your problems regarding work place?		
Yes, always	37	39,8
Sometimes	50	53,8
Never	6	6,5
Are employees in the hospital awarded frequently?		
Yes, always	9	9,7
Sometimes	15	16,1
Never	69	74,2
Does administration of hospital give information about vision of hospital?		
Yes	73	78,5
No	20	21,5

In Table 4 it can be seen that 51% of participants thought that administration organized adequate trainings about situations threatening patient and employee safety. Only 6,5% of participant stated that hospital management doesn't take care of their problems regarding work place. 74,2% of health workers indicated that employees in the hospital were not awarded frequently.

In order to investigate relationships between age, education and work experience with satisfaction abaout occupational safety, task definition and relations with administration of hospital statistical analysis were done. Results can be seen on Table 5.

Table 5. Correlations between experience and work satisfaction of health workers

	Age	Education	Work Experience	Eff. Use Of Human Resources	Work Environment Safe	Administrative Occ.Safe Precautions	Precise Task Definition	Management Relations
Age	1	0,025	0,616**	-0,173	-0,036	-0,164	-0,093	-0,245*
Education	0,025	1,000	-0,322**	0,002	0,219*	0,114	0,122	-0,065
Work Experience	0,616**	-0,322**	1,000	-0,168	-0,145	-0,176	-0,229*	-0,269**
Eff. Use Of Human Resources	-0,173	0,002	-0,168	1,000	0,337**	0,458**	0,288**	0,428**
Work Environment Safety	-0,036	0,219*	-0,145	0,337**	1,000	0,623**	0,305**	0,342**
Administrative Occ.Safe Precautions	-0,164	0,114	-0,176	0,458**	0,623**	1,000	0,318**	0,515**
Precise Task Definition	-0,093	0,122	-0,229*	0,288**	0,305**	0,318**	1,000	0,164
Management Relations	-0,245*	-0,065	-0,269**	0,428**	0,342**	0,515**	0,164	1,000

*p<0,05, **p<0,01

Spearman rank correlations were calculted for statistical analysis. . It was found that there was a negative relationship between age and satisfaction about management relations in the hospital (-,245, p<0,05) . This may result from higher expectations of older workers. Also health workers having more work experience were not satisfied with management relations (-,269, p<0,01).

Health workers who thought they were working in a safe workplace were more satisfied with management relations (,342, p<0,01). When relationship between work experience and satisfaction with definition of task was analyzed, a negative correlation was found (-,229, p<0,01). A positive correlation was found between effective use of human resources and precise task definition (,288, p<0,01). Also a positive correlation was found between effective use of human resources and satisfaction with administrative relations. As a result it can be said that priority should be given to improve relationships between management and staffs. Employees should feel themselves as a part of the organization.

4. DISCUSSION

Organizations are facing several challenges due to the dynamic nature of the environment. One of the many challenges for a business is to satisfy its employees in order to cope up with the ever changing and evolving environment and to achieve success and remain in competition. In order to increase efficiency, effectiveness, productivity and job commitment of employees, the business must satisfy the needs of its employees by providing good working conditions

Job satisfaction is very important in every work environment but in health institutions as human being is in the center of service, health sector should give point to satisfaction of employees seriously. Attitudes of employee affect patients' perception very much. Health workers' kindness, compassion, interest, understanding and talent lead to patients' cooperation in the treatment procedure [10].

In a study conducted in İzmir, Turkey, patients indicated reliability as most important dimension of health service quality [11]. The most effective factor on patient satisfaction is attitudes and behaviors of health workers. Sevimli and İşcananalyzed individual and institutional factors affecting motivation of employees and found that age, work experience and opinions about work place influence satisfaction of employees. Our study is compatible with these studies [12].

In a study conducted on secretaries by Ünalan and friends 32,9% of employees declared that administration of workplace didn't take enough measures in order to prevent employees against work place accidents [7]. Although we found smaller rates these finding is similar to our study.

Gyekye [16] found a positive relationship between job satisfaction and occupational safety of work environment. In our study 73,15% of participants found occupational safety precautions of administration of hospital adequate. Occupational safety in work place increases job satisfaction of employees [7]. Also ergonomic and technic conditions of work place influence motivation of workers [17]. In our study 33,3% of health workers stated that there was not adequate technical infrastructure at work. This was conflicting with some other studies [16,17].

Although new building of Bismil Public Hospital was constructed in 2014, employees found technical infrastructure of work place good.Efforts of management of the hospital regarding occupational safety contributed to motivation of health workers.

In a previous research 21% of nurses claimed that they were exposed to physical and verbal violence [13]. Our violence rate is smaller than this finding. It means that in recent years there have been amendments in relations between health workers and patients. Trainings that aims enhancementof employees'noticing of his/her feelings, attitudes and anger levels should be performed [17]. Thus violence against health workers exposed by patients and patients' relatives can be reduced.

In our study 74,25% of participants stated thatemployees in the hospital were not awarded frequently. Erdem and friends argued that awarding is a very important factor on job satisfaction besides working conditions [15-16]. We can say that by rewarding administrators in hospitals can raise job satisfaction among workers.

5. RESULTS

Health institutions are work places that human resources and technologic knowledge take an active role in health services. Efficiency and effectiveness in health services cannot be only provided by high technologic facilities, human behavior is a major factor in supplying health services.

Consequently quality of services is related with morale and motivation of employees. On the other hand increasing rates of job satisfaction enhances the services in a health institution.

According to our results efforts of hospital administration regarding occupational safety of employees, sufficiency of inservice trainings and opportunity of employees to communicate with managers and attention of administration to problems of workers affect job satisfaction in health institutes. Additionally we found that efficient use of human resources, informing employees about vision and quality targets of hospital contribute to performance of workers.

In order to prevent occupational accidents and diseases to take ergonomic and technological preventive measures by administration leads to workers' feeling them more safe and happy. Also awarding employees according to their success and contribution to performance of hospital motivates them.

It is obvious that to take measures and increase efforts about all of these factors will influence the morale, motivation and performance of health workers.

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EXAMINING POST GRADUDATE THESES IN NURSING IN TURKEY BETWEEN 1980-2015

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ABSTRACT

The aim of this study is to examine post-graduate thesesin nursing in Turkey between 1980-2015 and to determine the distribution of theses according to years, research types and research topics.

The study was carried out with documental analysis. Theses on the subject area were collected from National Theses Center of Turkish Council of Higher Education. When the research studies are analyzed, what draws attention is that nearly all of them are experimental or quasi-experimental studies. The researchers mostly examined organizational behaviors. Another topic examined in graduate theses was patient care. Most common third experienced subject in field of nursing was nursing education.

According to our results 44,37% of postgraduate theses in nursing were conducted in 2007-2015, 34,46% in 2000-2006 and the others before 2000. While 33,33% of postgraduate theses in nursing focused on patient care in 2000-2006 this proportion increased to 44,18% in 2007-2015. 258 (38,16%) of 676 theses focused on patient care, 303 (44,82%) on organizational behavior and 115(17,01%) on nursing education. When distribution of research designs used in postgraduatetheses in nursing was analyzed 32,69% of theses were designed experimental, 18,78% quasi-experimental and 39,49 non-experimental. 6,80% of postgraduate theses were descriptive.

Keywords: *Nursing, post graduate theses, research design, research topic, Turkey.*

1. INTRODUCTION

Important changes have occurred in nursing education in Turkey as in the rest ofthe world in recent years. Nursing education has been continuing in a complex education system providing different diploma degrees as high school, bachelor, undergraduate, graduate and post graduate [1-3]. In 1972, the Nursing Doctoral Education Program was initiated in Turkey [4]. So much development has been made since that time in the field of nursing education.

While undergraduate education gives students a broad, general education, postgraduate education provides students with more advanced learning in a specialized discipline or sub-discipline. Postgraduate school gives an in-depth understanding such that the student becomes something of an expert in the topic of study. It also teaches advanced skills in such areas as problem solving,

mathematics, writing, oral presentation, and technology, each as applied to the particular field of study.

Over last ten years as it has been in every field, the number of graduate theses have increased and are continuing to increase with time in Turkey [5]. Now it is possible to come across studies on various different topics. On the other hand the increase of these studies comes the problem of getting them across to their target audiences. As it takes a long time for readers or other researchers to look over these findings, , it has been decided that all of this information must be gathered under one roof, analyzed once more, and that new comments and conclusions must be reached [6].

When post graduated theses in the field of nursing are examined it can be seen that as many theses, most of them are designed experimental, quasi-experimental, mixed and descriptive.

"A research design is the plan of a research study. The design of a study defines the study type (descriptive, correlational, quasi- experimental, experimental, review, meta-analytic) and sub-type (e.g., descriptive-longitudinal case study), research question, hypotheses, independent and dependent variables, experimental design, and, if applicable, data collection methods and a statistical analysis plan. Research design is the framework that has been created to seek answers to research questions" [7].

"Experimental research is a collection of research designs which use manipulation and controlled testing to understand causal processes. Generally, one or more variables are manipulated to determine their effect on a dependent variable. The experimental method is a systematic and scientific approachto research in which the researcher manipulates one or more variables, and controls and measures any change in other variables On the other side quasi experiments resemble quantitative and qualitative experiments, but lack random allocation of groups or proper controls, so firm statistical analysis can be very difficult. Quasi-experimental design involves selecting groups, upon which a variable is tested, without any random pre-selection processes. Descriptive research design is a scientific method which involves observing and describing the behavior of a subject without influencing it in any way" [7].

When postgraduate theses in the field of nursing were examined it was observed that all of them focused on specific topics. The researchers mostly examined organizational behaviors. Another topic examined in graduate theses was patient care. Most common third experienced subject in field of nursing was nursing education.

"Organizational behavior is the study of human behavior in organizational settings, the interface between human behavior and the organization, and the organization itself. It deals with individuals in organization, work groups and behaving of organizations" [8].

Postgraduate theses in the field of nursing focused on organizational behavior examined these topics in health institutes:

- ✓ Stress
- ✓ Individual attitudes and behaviors
- ✓ Role of Ethics
- ✓ Job satisfaction
- ✓ Motivation
- ✓ Health management
- ✓ Organizational Culture

Most discussed topics by post graduate theses in nursing on patient care were:

- ✓ Medical nursing
- ✓ Surgical nursing
- ✓ Obstetric and Gynecology nursing
- ✓ Mental nursing
- ✓ Pediatric nursing
- ✓ Epidemic diseases
- ✓ Emergency care
- ✓ Work place and worker health nursing

Postgraduate theses in nursing focused on nursing education examined new approaches, assumptions and priorities and problems in nursing education.

2. METHOD:

In this study post-graduate theses in nursing between 1980-2015 were examined and distributions according to years, research types and research topics were determined.

The study was carried out with documental analysis. Theses on the subject area were collected from National Theses Center of Turkish Council of Higher Education. 676 theses were investigated. Distribution of theses in nursing according to years was analyzed and results were shown in Table 1.

Table 1.Distribution of postgraduate theses in nursing according to years

Years	N	%
1980-1989	11	1,62
1990-1999	132	19,52
2000-2006	233	34,46
2007-2015	300	44,37
Total	676	100

According to Table 1, 44,37% of postgraduate theses in nursing were conducted in 2007-2015, 34,46% in 2000-2006 and the others before 2000.

In Table 2 distribution of post graduate theses in nursing according to topics can be seen.

Table 2.Distribution of post graduate theses in nursing according to topics

Years	Topics							
	Organizational Behavior		Patient Care		Nursing Education		Total	
	n	%	n	%	n	%	n	%
1980-1989	5	0,16	5	0,19	1	0,01	11	0,01
1990-1999	70	23,10	53	20,54	9	7,82	132	19,52
2000-2006	111	36,63	86	33,33	36	31,30	233	34,46
2007-2015	117	38,61	114	44,18	69	60,00	300	44,37
Total	**303**	**100**	**258**	**100**	**115**	**100**	**676**	**100**

As can be seen from Table 2 while 33,33% of postgraduate theses in nursing focused on patient care in 2000-2006 this proportion increased to 44,18% in 2007-2015. 258 (38,16%) of 676 theses focused on patient care, 303 (44,82%) on organizational behavior and 115 (17,01%) on nursing education.

Distributions of research designs used in postgraduate theses in nursing were examined and results were shown in Table 3.

Table 3. Distribution of research designs used in postgraduate theses in nursing

Design of the research	N	%
Experimental	221	32,69
Quasi-experimental	127	18,78
Non experimental	267	39,49
Mixed	46	6,80
Descriptive	15	2,21
Total	**676**	**100,0**

According to Table 3 when distribution of research designs used in post graduate theses in nursing was analyzed 32,69% of theses were designed experimental, 18,78% quasi-experimental and 39,49 non-experimental. 6,80% of postgraduate theses was descriptive.

Table 4. Distribution of postgraduate theses in nursing according to research design and years

Years	Research design					Total
	Experimental	Quasi-experimental	Non experimental	Mixed	Descriptive	
1980-1989	4	1	6	0	0	11
1990-1999	40	3	77	10	2	132
2000-2006	77	53	79	16	6	233
2007-2015	100	70	103	20	7	300
Total	221	127	267	46	15	676

It can be seen from Table 4 that number of non-experimental designs are smaller than number of experimental and quasi-experimental designs in all periods.

3. DISCUSSION

After examining postgraduate theses in the field of nursing, we determined that before 1990 the research designs of theseswere mostly non experimental. Use of experimental and quasi-experimental designs in nursing researches began to increase after 2000s. Tel and Sabancıoğullarından found compatible results with us [9]. They examined theses in the field of physiciatric nursing and found that 55,5% of theses were quasi experimental and 35,4% descriptive. Aslan and friends investigated that 45% of PhDtheses were experimental and 2% were descriptive [10]. In a study conducted by Ardahan and Ozsoy on PhDtheses and they stated conflicting results with our study that 45,65% of theses were descriptiveand 16% were experimental [11].

A meta analysis conducted by Lee and friends among 1089 postgraduate theses written in 1982-2010 found out that most of the theses (51,5%) were designed experimental, 38,8% epidemiologic and 5% descriptive [12]. Shin and friends examined PhDtheses in the field of nursing in 2000-2006 and investigated that of theses 45% were experimental, 23% methodological and 17% descriptive [13]. These results were compatible with ours.

In this study postgraduatetheses in the field of nursing were examined according to years, research types and research topics. It can be seen that number of theses is increased year by year and more scientific methods have begun to be used in the research processes of theses. Also topics of theses converted from job satisfaction, role of ethics, individual attitudes and behaviors, communication, health management and organizational culture to patient care as medical nursing, surgical nursing, epidemic diseases, emergency care and work place and worker nursing.

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DIGITAL HOSPITAL ; AN EXAMPLE OF BEST PRACTICE

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Digital Hospital is a concept contributing to enhancing personnel productivity, facilitating hospital operations, improving the process quality and ensuring patient safety by integrating cutting-edge technologies such as medical devices, smart information systems, facility control and automatic conveyor systems, location-based services, sensors and digital communication tools into health processes. The primary aim of this study is to address the theoretical and practical aspects of "Digital (paperless) hospital" concept, which is addressed in a limited number of studies, and investigate the digital hospital practices of Izmir Tire Public Hospital and Giresun Tirebolu Public Hospital, which entered into the list of top digital hospitals in Europe as examples of best practices. The study was prepared based on the interviews with the managers of Tire Public Hospital and Tirebolu Public Hospital awarded with digital hospital certificates by HIMMS (International Accrediting Agency) in 2016.

18 hospitals received "Stage 6" and one hospital (Tire Public Hospital) received the top-level "Stage 7" digital hospital certificate, which was awarded to four hospitals in Europe by 2016 in Turkey. In the hospital transforming into a top level digital hospital and offering services with this concept; speed and efficiency of business processes increase, paper and document expenses are cut to zero, human-made errors are minimized. Diagnosis and treatment processes are provided not only within the hospital walls but also to long distances. By the help of digital hospitals health data are immediately and retrospectively retrieved at any time by the authorized body, other health institutions and patients and can be forwarded via sensors, cameras and early warning systems without requiring follow-up by humans, fast and right decisions can be given thanks to decision support systems, and the right medicine is administered to the right patient, at right doses and at the right time by the Closed Loop Drug Delivery System. With the widespread access to digital hospitals, it will be possible to benefit from all these advantages and offer the most effective and efficient healthcare services to the patients within the shortest time. Hospital personnel will have less workload and be less likely to make mistakes.

Keywords: Digital Hospital, e-Health, Smart Hospital, HIMMS

1. INTRODUCTION

In the early years of their foundation, hospitals dating back to Seljuk period were named darush-shifa and shifahane, (Kayseri Gevher Nesibe Shifahane, Edirne Sultan Bayezid II Darush-shifa etc.) and located inside the complexes consisting of structures like madrasa, mosque and bathhouse [1]. Hospitals achieved their traditional structures in early 1900s with independent service premises.

Hospitals undergoing transformation in accordance with the needs of the current time, differently from their early examples, now aim to integrate the state-of-art technology (telemedicine, mobile health, digital hospitals etc.) into the service processes and carry their services to remote regions with the concept of *"digital hospital"* without time and space limit as opposed to traditional structures providing physical location-dependent services.

Digital hospital concept is a practice coming to the forefront and invested in by developed countries in recent years. United States have moved one step further by making a first in the world and founding a hospital without beds in Missouri named Mercy Virtual Care Center that offers distant diagnosis and treatment methods [2]. Turkey follows the developments in the world closely and makes reforms in healthcare services accordingly, therefore "digital hospital" works were started in 2013 and one of the four top-level digital hospitals in Europe (Tire Public Hospital) was founded in 2016. The outcomes of digital hospitals demonstrate that hospitals practicing this system gain an efficiency of 35% [3].

In this context, the aim of this study is to address the criteria of digital hospital concept and the advantages of this system compared to traditional hospitals.

2. DIGITAL HOSPITAL

New scientific and technological innovations made it possible the acquisition, archiving, handling and visualization of an amount of various data and phenomenon everywhere in hospitals, which are involved in biomedicine, medical engineering, clinical diagnosis, sanitary economics, hospital administration and culture [4]. *Digital Hospital* is a concept contributing to enhancing personnel productivity, facilitating hospital operations, improving the process quality and ensuring patient safety by integrating cutting-edge technologies such as medical devices, smart information systems, facility control and automatic conveyor systems, location-based services, sensors and digital communication tools into health processes [5,6,7]. Common sharing of medical information resources and adaptation to local circumstances enables the information processing and communication function to be achieved on a complete platform, which offers completeness to present hospital management and future medical environment [8].

According to the Ministry of Health, *Digital Hospital* can be defined in a broad sense from a hospital where maximum level of information technologies is used in administrative, financial and medical processes, to a hospital where all kinds of communication tools and medical devices are integrated with each other and with other information systems, and healthcare staff and patients can exchange data inside or outside the hospital by using telemedicine and mobile medicine practices [9]. Digital hospital is an important goal of the hospital construction, which is significant for promoting medical development and improving healthcare quality [10].

The use of information and communication systems for the prevention, diagnosis, treatment and monitoring of diseases and provision of health counseling in healthcare services is described with the term "*e-Health*" [11]. In this context, "Digital hospital, mobile health, telemedicine and robotic health" are defined as the *sub-components of e-Health.*

Digital Hospital carries the hospital services to individuals outside the hospital walls (to houses, emergency stations etc.) by integrating information and communication technologies into clinical and administrative workflow processes in order to offer high-quality healthcare services, as wells as connecting healthcare staff and units working at distant locations from each other.

Digital hospital concept is recently one of the practices in the forefront in healthcare sector. Therefore, many hospitals in Europe and Turkey underwent transformation processes and initiated accreditation activities to receive a *"digital hospital"* certificate. In 2016, the hospitals in Turkey were checked by HIMSS (accrediting agency) and 18 hospitals received "Stage 6" and one hospital received the top-level "Stage 7"digital hospital certificate. HIMSS is a non-profit organization founded in 1961 incorporating 52,000 healthcare provider institutions, 600 firms and 250 associations/foundations around the world, with structures in the USA, Europe and Asia (EMRAM). The EMR Adoption Model (EMRAM) is an eight-stage model that allows you to track your progress against other healthcare organizations around Europe and across the world [2]. The purpose of its foundation is to ensure the optimum use of information technologies in the provision and development of healthcare services. Digitalization levels of hospitals are rated with EMRAM at an international level. In this process, the level of use of information systems in the operation of healthcare organizations is inspected and accredited. HIMSS uses the universally accepted accreditation and standard model EMRAM to assess the digital processes and determine the stages of applicant hospitals. In this model, hospitals are rated from 1 to 7 and the ones completing their digitalization process up to 6^{th} and 7^{th} stages are awarded with certificates. With EMRAM staging, HIMSS facilitates the adaptation of hospitals to ever-growing health information technologies at international standards.

For a hospital to be a digital hospital, it must be assessed and awarded with a certificate by the accrediting agency HIMSS. The relevant assessment criteria and stages are tabulated below. When criteria in the table are met, hospitals apply to the HIMSS agency. Experts assigned by HIMSS inspect the relevant hospital on-site and rate it pursuant to its compliance with the published criteria, and award it with a certificate accordingly [13].

Table 1. - HIMSS EMRAM Digital Hospital Stages and Criteria

Stage 7	A hospital at this stage never uses *paper documents* while providing services. All data, documents and medical images are processed electronically. Data stored in a digital environment are analyzed and used to increase the quality of healthcare, ensure patient safety and offer efficient services. The relevant data are standardized electronically ready for use and information exchange by authorized persons and institutions (management, other hospitals etc.). The hospital ensures the data continuity of all service processes and publishes such data. At this stage, healthcare materials such as blood products are also made available via *Closed Loop Medication Administration System.*
Stage 6	A full-fledged and marketable physician documentation system is in practice for at least *one in-patient clinic.* Third stage clinical support system provides guidance in all clinical processes. Closed loop medication management system and coded drugs system are fully in practice. To maximize the patient safety, other automated identification technologies and automated delivery systems such as electronic medication management record and computerized physician order entry/e-Prescription and Barcoding or RFID (radio frequency identification) integrated with the pharmacy are in practice. Thus, in accordance with "5 rights (right patient, right drug, right dose, right route and right time)" principle developed in order to prevent Erroneous Drug Use, patient credentials and medicine barcode are verified at the patient bedside.
Stage 5	Medical images in the full-fledged Radiology Image Archive and Communication System (PACS) are open to the access of all physicians and sent to other locations via intranet. At this stage, if image documents of cardiology department (ECG etc.) are entered into the PACS system, the hospital is given extra points.
Stage 4	At this stage, the second stage of clinical decision support systems for evidence-based medical protocols is available. In this system, any licensed Clinician can write an order and add a nurse for his/her access to data in the Computerized Physician Order Entry (CPOE) system. If the Computerized Physician Order Entry system is used in an in-patient service area and previous stages are completed, then this stage is deemed to be completed as well.
Stage 3	Clinical documents regarding nursing care (vital signs, flow sheets, nursing notes, eMAR) and/or electronic medication management record and order entry and tracking systems must be integrated with electronic patient records and clinical data store in at least one service process. The first stage of clinical decision support may be practiced to check the errors in order entry. Drug/drug, drug/food, drug/laboratory interaction data are usually available in the pharmacy. Medical pictures in the picture archive must be accessible from the system via intranet to the physicians outside the radiology department.
Stage 2	Information systems of the clinical data repository (CDR) send all kinds of medical information and results of the patients to a system viewable by the physicians. This system sends data to the Electronic Patient Record or Clinical Data Archive receives feedback and forward them to the sub-systems. The system can receive and send medical picture documents and enable information exchange between hospitals.
Stage 1	It describes that digital systems are set up in main clinical support units (pharmacy, laboratory and radiology).
Stage 0	It describes the hospitals where even main clinical support units (pharmacy, laboratory and radiology) and processes are not included in digital environment.

3. METHOD

In the present study, the results concluded by considering the interviews with the managers of Tire Public Hospital and Tirebolu Public Hospital awarded with digital hospital certificates by HIMMS (International accrediting agency) in 2016 are presented below.

4. FINDINGS

4.1. An Example of a Digital Hospital - Tire Public Hospital

After interviews with the managers of hospitals it was seen that in the course of awarding Tire Public Hospital with "Digital Hospital, Stage 7"certificate, following arrangements were determined to be made:

- ✓ Patient admission, hospitalization and other clinical processes, consultation and referrals are moved onto paperless digital platform.
- ✓ Practices such as e-prescription and e-signature are initiated in the hospital.
- ✓ Orders for MR, X-Ray, ECG, blood and other tests (hearing test etc.) are concluded without papers in a computer environment. Results of these orders are submitted in the digital environment. These results can be accessed anywhere both by healthcare staff and patients via phones and tablets.
- ✓ All generated data (records, results, invoices etc.) are archived in the digital environment, and information safety is ensured.
- ✓ Treatment orders of physicians are completely processed in an online environment immediately and by remote access.
- ✓ With the computer terminals placed in patient rooms, nurses enter the treatment information into the system without using any paper or document, thus pharmacy, stock tracking and invoicing system can record the entries and exits immediately.
- ✓ Thanks to the *Closed Loop Medication Administration System* the right drug is administered to the right patient, at right doses, via the right route and at the right time.
- ✓ All administrative documents and correspondences in the hospital (excluding purchasing documents as required by laws) are followed up in the electronic system and e-signature is used in the documents.
- ✓ Programs such as budget and stock alert systems are used to view the resources all the time.
- ✓ Infrastructure components such as fire system, security, electricity, water and natural gas are followed up by a central system. In emergency cases, these technologies can be activated.
- ✓ None of the data generated in the hospital get lost and all data can be accessed from anywhere and anytime.
- ✓ As paper is not used, stationary costs are saved.
- ✓ Hospital services can be provided fast and efficiently thanks to the smart software.

Practices listed above are the requirements for Stage 7 in "Digital-Paperless Hospital" classification. Moreover, Giresun Tirebolu Public Hospital in Turkey awarded with "Stage 6" certificate was checked and informed that all processes (drug tracking, patient admission etc.) had to be performed in the digital environment in at least one clinic of the hospital in order to be awarded with the Stage 6 certificate. Therefore, Pediatric Clinic of the hospital was equipped with a digital system and strictly checked by HIMSS.

5. CONCLUSION

As seen in our study, *Digital hospitals* increase the speed and efficiency in business processes and cut the paper and document costs to zero. From the viewpoint of working personnel, human-made mistakes are eliminated and data can be retrieved by authorized units, other healthcare institutions and patients immediately and retrospectively at any time [14].

Diagnosis and treatment processes can be managed not only within the hospital walls, but also from long distances. Some processes can be managed with sensors, cameras and early warning systems without the need for follow-up by humans (for example, software that warns of too high blood test results).

With the *Closed Loop Medication Administration System* between the pharmacy and the patient's room, which is one of the services provided by Digital Hospitals, after the drugs are e-prescribed by the physician, they are brought to the patient via a channel with smart software and taken to be administered by the relevant personnel. Thanks to the closed loop drug delivery system, patients can benefit from healthcare services better and waste of drugs can be prevented.

In digital hospitals, fast and right decisions can be given thanks to the decision support systems. A structure is formed in compliance with the lean management philosophy, which is a much discussed and increasingly more practiced approach in recent years, and transition to lean hospital practices is accelerated.

With the widespread access to digital hospitals, it will be possible to benefit from all these advantages and offer the most effective and efficient healthcare services to the patients within the shortest time. Hospital personnel will have less workload and be less likely to make mistakes.

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