

## Comparison of Levels of Occupational Diseases Between Physical Education Teachers and Teachers in Other Branches

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**Abstract:** The aim of this study was to define and compare the occupational diseases that frequently relapse in physical education teachers and teachers in other branches. 64 physical education teachers from Malatya Province, 30 physical education teachers and 30 teachers in other branches from Amasya Province and 16 physical education teachers and 83 other branch teachers from Şırnak province took part in the study. Statistical data of the diseases of 113 other branch teachers and 110 physical education teachers - 223 in total - [in physical education branch, 42 females (38.2%) and 68 males (61.8%) and in other branches, 52 females (46.0%) and 61 males (54.0%)] in 2010 were analyzed. The level of statistical significance was considered to be 0.05. In the evaluation by branches; musculoskeletal system diseases (24.5%), brain and neurological diseases (29.1%), dermatological diseases (30.9%), hematological diseases (11.8%) and gastrological diseases (23.6%) were seen in physical education teachers ( $p < 0.05$ ). In other branch teachers, general surgery diseases (17.7%) were found to be very often ( $p < 0.05$ ). Otorhinolaryngology diseases (54.5-41.6%), neurological diseases (10.0-8.0%), cardiovascular diseases (10.0-9.7%) and urological diseases (10.0-8.0%) were frequently seen in both physical education teachers and teachers in other branches. In an evaluation by gender; general surgery diseases (20.2%), urological diseases (13.8%) and hematological diseases (12.8%) were seen in females ( $p < 0.05$ ) whereas neurological diseases (14.0%) were seen in males ( $p < 0.05$ ). Musculoskeletal system diseases (12.8 - 21.7%), otorhinolaryngology diseases (40.4-53.5%), brain and neurological diseases (18.1-14.7%), dermatological diseases (23.4-14.0%), cardiovascular diseases (11.7-8.5%) and gastrological diseases (20.2-12.4%) were reported in males and females, respectively. As a conclusion, physical education teachers had a high tempo in both mental and physical terms. Statistical findings supported that musculoskeletal diseases, brain and neurological diseases, hematological and gastrological diseases are seen in physical education teachers more frequently.

**Key words:** Teacher • Physical Education • Occupational Diseases

### INTRODUCTION

Teachers have a versatile and vital role to play in the teaching and learning process. In most of the cases, as behaviors of teachers pose a model for students, studies should be conducted to define the life styles and health behaviors of teachers and their needs for health education. Despite the fact that teaching is an exclusive area of occupation, it is used to be a secondary mission carried out by clerics or philosophers for many years in addition to their primary occupations [1]. As a result, a teaching school (Darülmualim) was first established after the reorganization period in the Ottoman History, which

ensured that teachers started to be trained in an exclusive school to train teachers. Teaching has been defined as an area of specialization that undertakes the duties of the state in education and training and related duties [2]. The quality of teachers thus started to be handled in the higher education level [3] since 1982, training of teachers has been covered by universities [2].

An occupation is defined as the activity or job which is conducted to make a living and to produce goods and/or services for the good of the public by using the knowledge and skills acquired through a certain education [4]. Occupation is a title acquired as a consequence of a knowledge and skill development process. In the

meantime, jobs and occupations can be used as a significant variable in developing hypotheses towards the etiology of diseases or health results. Teachers spend an overwhelming majority of their lives in the same occupational environments by working within a regular order for days and weeks, which can affect their health. In health studies, variables concerning occupation, job and working status (working/not working) are used to examine the health problems which might stem from the work of workers. Professional and occupational anamnesis is important in detection of diseases [5].

Occupational diseases are the temporary or permanent diseases, disabilities or mental problems due to some reasons that keep repeating according to the nature of the job of an individual or due to the working conditions of an occupation [6]. These are the diseases that stem from the existence of the basic etiologic factor in the work place [7]. It is possible to avoid occupational diseases in certain terms provided that required measures are taken in work places [8]. The approach of countries towards occupational diseases has always been closely related to their development level and scientific and social situations within the historical process. In scientific terms, Bernardino Rammazzini, a great Italian physician, was the first individual to attract attention seriously to occupational diseases in early 17<sup>th</sup> century [9]. Rammazzini diagnosed many occupational diseases including occupational asthma-bissinosis-pneumokonyozlar etc... which are still an issue today and tried to attract the attention of the society and physicians. As the question of Hippocrates "what is your complaint?" is considered as a revolution in medicine, the question of Rammazzini "what is your occupation?" facilitated the approach to the patient and helped examination of the diagnosis within an integrity [10].

Although occupational diseases have increasingly been recognized as "the diseases of employees" all around the world since 1980s, they are still regarded as the diseases of workers who are subject to the Social Security Institution Code no: 506. These diseases can be diagnosed by institutions which are officially authorized by the Social Security Institution [11, 12].

In general, occupational diseases are characterized by a specific clinical table, biological existence of a well-defined pathogen agent or metabolite in the environment, experimental formability of the disease and a high incidence of the disease among the employees in that occupation [13].

Occupational Diseases Hospitals of Ministry of Health in Ankara, Istanbul and Zonguldak provinces and university hospitals to be assigned by the Institution are

authorized to issue a medical board report. The Health Boards of the Institution will decide whether the problems/diseases that occur within the body of the insured individual after the date of recruitment or that cannot be treated are occupational or not and whether the existing problems/diseases result in any decrease in the operating power or gaining power in the profession. The list of occupational diseases regulates which diseases should be considered as occupational and until when these diseases should come out after the actual resignation from the job in order to qualify as stemming from the occupation of the insured individual [13].

The responsibility of an employer in prevention of occupational diseases is that employees should not be made work in heavy and dangerous works without having the required examinations completed. In order to protect the employees from the risks related to the working environment and the work itself, training should be given to employees. The employer is responsible for provision and proper utilization of personal protective equipments for employees. The employer is also responsible for assessment of the environmental risks in the working place and taking the precautions and measures required [13].

Physical infirmity due to occupational diseases is defined as the disability calculated according to the principles for calculating the proportion of the operating power and occupational gaining power losses due to temporary or permanent diseases or physical or mental disabilities that stem from any repeating reasons by the nature of the work conducted or the working conditions themselves. Based on the report issued by health boards, the occupational diseases or disabilities are determined by the health boards of the Institution [13].

Occupational musculoskeletal system problems can be listed as headaches, neck pains, shoulder pains, elbow pains, tendonitis in hands and wrists, hand and arm vibration syndrome, myofacial pains accompanied by psychosomatic problems and circulatory disorders such as varicose veins and lymph edema due to standing for a long time.

Occupational problems in neck include; Myofacial Pain Syndrome: As it is characterized by cervical sensitive trigger points and reflective pains, it constitutes the most-frequently encountered and diagnosed group among chronic pain reasons [13]. Muscle Spasm is reported that flexion of the neck for a long time due to occupational reasons or situations requiring frequent rotation of the neck may result, due to muscle contractions, in pain and tension sensation in arms and neck and in time, foramina restrictions and degenerative

modifications (spondylosis) [13]. Spondylosis: Pain, sensitivity, restricted motion and morning stiffness are among the mostly-reported complaints. Studies have shown that C5 - C6 stiffness is more common in teachers who sit down all the time while C6 - C7 stiffness is more common among physically-working individuals [13].

**Occupational Problems in Shoulders:** The most frequently seen complaint is pain in arms and shoulders. As the roots C8 and T1 are frequently pressurized, burning pains and pins-and-needles could be seen in the ulnar nerve area [13].

**Occupational Lumbar Problems:** Lumbar problems include lumbar pain and herniated disc. As educators, academics and teachers spend a lot of time by standing, they suffer from occupational muscular diseases [13].

However, occupation conditions of teachers also include the high stress level, high tempo, unbalanced nutrition, lack of proper fresh air ventilation in very crowded classrooms and insufficient motion sitting at their desk all the time as well as the fact that they have to use their voice all the day, which might all result in many diseases other than muscular diseases [13].

To this end, this study aimed at determining the occupational diseases incidence of branch teachers and physical education teachers in Malatya, Amasya and Şırnak provinces.

## MATERIALS AND METHODS

**Population and Sample:** The population of the study included 64 physical education teachers from Malatya province, 30 physical education teachers and 30 teachers in other branches from Amasya province and 16 physical education teachers and 83 teachers in other branches from Şırnak province. Data of 113 branch teachers and 110 physical education teachers - 223 in total - belonging to the year 2010 were statistically identified. Thirty four of the physical education teachers in Malatya province were male and 30 were female; out of the branch teachers in Amasya province, 21 were male and 9 were female while out of the physical education teachers in the same province, 22 were male and 8 were female; out of the branch teachers in Şırnak province, 40 were male and 43 were female while out of the physical education teachers in the same province, 12 were male and 4 were female. In total, disease data of 129 male and 94 female teachers were identified under the study.

**Model of Study:** Studies aiming at identification of an existing situation as it is and explanation, comparison and description of attitudes and behaviors are called screening studies [14, 15]. As the aim of the study was to reflect the existing situation of the diseases of physical education teachers and teachers in other branches in 2010, the study was designed as a descriptive study within the screening model.

**Data Collection:** Disease data of teachers were collected from Provincial Health Directorates, Provincial Education Directorates and Hospitals after the relevant permissions were granted.

**Data Analysis:** The study took into consideration the diseases of 223 teachers diagnosed in healthcare institutions upon their applications to healthcare institutions for their various health problems between the 1<sup>st</sup> of January 2010 and 30<sup>th</sup> of December 2010. These diseases were classified by two different physicians and percentages have been presented in cross-tables. The independent chi-square test was used in data analysis. The level of significance was considered to be 0.05.

## RESULTS

There were 113 branch teachers as well as 110 physical education teachers - 223 in total. By gender, in physical education: 42 females (38.2%) and 68 males (61.8%); in other branches: 52 females (46.0%) and 61 males (54.0%). In the evaluation of diseases in 2010 by branches; musculoskeletal system diseases (24.5%), brain and neurological diseases (29.1%), dermatological diseases (30.9%), hematological diseases (11.8%) and gastrological diseases (23.6%) were seen in physical education teachers ( $p < 0.05$ ). In other branch teachers, general surgery diseases (17.7%) were found to be very often ( $p < 0.05$ ). Otorhinolaryngology diseases (54.5-41.6%), neurological diseases (10.0-8.0%), cardiovascular diseases (10.0-9.7%) and urological diseases (10.0-8.0%) were frequently seen in both physical education teachers and teachers in other branches (Table 1). In an evaluation by gender; general surgery diseases (20.2%), urological diseases (13.8%) and hematological diseases (12.8%) were seen in females ( $p < 0.05$ ) whereas neurological diseases (14.0%) were seen in males ( $p < 0.05$ ). Musculoskeletal system diseases (12.8-21.7%), otorhinolaryngology diseases (40.4-53.5%), brain and neurological diseases (18.1-14.7%), dermatological diseases (23.4-14.0%),

Table 1: Statistical comparisons of diseases of physical education teachers and teachers in other branches according to the 2010 data

Diseases	Physical Education						Other Branches						x <sup>2</sup>	p
	Yes		n/a		Total		Yes		n/a		Total			
	n	%	n	%	n	%	n	%	n	%	n	%		
Musculoskeletal	27	24.5	83	75.5	110	100	13	11.5	100	88.5	113	100	6.440	0.011**
ORL	60	54.5	50	45.5	110	100	47	41.6	66	58.4	113	100	3.747	0.053
Brain and Nerve	32	29.1	78	70.9	110	100	4	3.5	109	96.5	113	100	26.881	0.00**
Neurology	11	10.0	99	90.0	110	100	9	8.0	104	92.0	113	100	0.283	0.595
Dermatology	34	30.9	76	69.1	110	100	6	5.3	107	94.7	113	100	24.815	0.00**
Hematology	13	11.8	97	88.2	110	100	1	0.9	112	99.1	113	100	11.324	0.001**
Cardiovascular	11	10.0	99	90.0	110	100	11	9.7	102	90.3	113	100	0.004	0.947
Urology	11	10.0	99	90.0	110	100	9	8.0	104	92.0	113	100	0.283	0.595
General Surgery	6	5.5	104	94.5	110	100	20	17.7	93	82.3	113	100	8.114	0.004**
Gastrological Diseases	26	23.6	84	76.4	110	100	9	8.0	104	92.0	113	100	10.346	0.001**

Table 2: Statistical comparisons of diseases of physical education teachers and teachers in other branches according to the 2010 data by gender

Diseases	Female						Male						x <sup>2</sup>	P
	Yes		n/a		Total		Yes		n/a		Total			
	N	%	N	%	N	%	N	%	N	%	N	%		
Musculoskeletal	12	12.8	82	87.2	94	100	28	21.7	101	78.3	129	100	2.952	0.086
ORL	38	40.4	56	59.6	94	100	69	53.5	60	46.5	129	100	3.718	0.054
Brain and Nerve	17	18.1	77	81.9	94	100	19	14.7	110	85.3	129	100	0.453	0.501
Neurology	2	2.1	92	97.9	94	100	18	14.0	111	86.0	129	100	9.315	0.002**
Dermatology	22	23.4	72	76.6	94	100	18	14.0	111	86.0	129	100	3.299	0.069
Hematology	12	12.8	82	87.2	94	100	2	1.6	127	98.4	129	100	11.625	0.001**
Cardiovascular	11	11.7	83	88.3	94	100	11	8.5	118	91.5	129	100	0.616	0.432
Urology	13	13.8	81	86.2	94	100	7	5.4	122	94.6	129	100	4.703	0.030**
General Surgery	19	20.2	75	79.8	94	100	7	5.4	122	94.6	129	100	11.543	0.001**
Gastrological Diseases	19	20.2	75	79.8	94	100	16	12.4	113	87.6	129	100	2.506	0.113

cardiovascular diseases (11.7-8.5%) and gastrological diseases (20.2-12.4%) were reported in both males and females (Table 2).

### DISCUSSION

Our study aimed at researching into the main factors of the working life to define and to make a comparison of the frequently-recurring occupational diseases. Physical education teachers have high physical and mental tempo. Diseases related to musculoskeletal systems, neurological diseases, hematological and gastrological diseases are more often seen in physical education teachers while findings also supported that they suffered from lumbar pain, varicose, circulatory disorders, foot and joint pains, muscular disorders, malnutrition, anemia, folic deficiency, reflux, gastritis, peptic ulcer, nodules in vocal cords and respiratory diseases due to standing all the time, exposure to extreme climatic conditions, sedentary way of life, overuse of their voice and exposure to dust in crowded

classrooms and lack of fresh air circulation. Physicians and specialists recommend giving up the habit of cleaning the throat frequently to stay immune from diseases such as nodules and polyps, acquiring the habit of drinking plenty of water, not using menthol drops and pastilles, resting the legs on a level higher than the head if possible to stay away from varicose and preferring soft-base shoes with a wider nose.

Occupational accidents that started to be more common due to industrialization have started to be a more serious problem in Turkey, too. According to the figures of Social Security Institution, 79.027 occupational accidents and 574 occupational diseases were reported in 2006 in Turkey and 1.601 cases were reported with death [16]. The number of working days which were lost due to occupational diseases and accidents in the mentioned year was 1.895.235. The number of working accidents increased only by 15% whereas the number of accidents involving death increased within two years (2005 and 2006) by approximately 80% and reached up to 1601,

which is the recorded-high number within the last 18 years [16]. According to the definitions of International Labor Organization and World Health Organization occupational health is the effort to keep at the highest level, maintain and develop the physical, mental and social well-beings of people working in all professions. According to the World Health Organization definition, health is not limited to the non-existence of a disease or disability, but a full well-being in physical and mental terms [17]. International Labor Organization figures suggest as follows: 350.000 people lose their lives due to occupational accidents and 1.700.000 people die of occupational diseases annually in the world. Also, 270 million occupational accidents take place and 160 million people catch occupational diseases annually [18]. World Health Organization (WHO) developed the network of Health Promoting Schools in Europe in 1984. Turkey joined this project in 1994. Health Promoting Schools provide that the health and education sectors came together for cooperation in order to turn schools into environments that promote health for both students and teachers and other staff [19].

Tokuç *et al.* [20] stated that 85% of teachers had chronic diseases; 20.7 and 57.6% of them regularly and continuously take medication due to an existing chronic disease and chronic diseases included pharyngitis, laryngitis and bronchitis (20), asthma (8), allergic rhinitis (8), rheumatic diseases (10) and hypertension (10). In the sub-group of health responsibility, classroom teachers receive significantly-higher scores than branch teachers did whereas branch teachers have higher scores in stress management when compared to classroom teachers.

According to the occupational diseases directives of the Ministry of Health, teachers are classified in the group working under high stress. We can find diseases such as anxiety disorder and depression more frequently in these groups. Moreover, the incidence of gastrointestinal diseases is also quite high. High working tempo accompanied by high stress results in an increased incidence of diseases including malnutrition, gastritis, peptic ulcer and spastic colon. In teachers who work in classrooms that do not require any physical effort, passivity brings about many risks. Overweight, cardiovascular diseases, high blood lipids and sugar metabolism disorders tend to increase in this group. The working environment of teachers is also important. As teachers work in crowded environments, they are under risk vis-à-vis infection diseases communicable through respiratory track. As they have to speak all the time, incidence of diseases related to vocal cords and throat is high [13]. Arslan *et al.* [21] reported wrist and

back pains and visual defects in people working with computers; the risk to catch every disease, particularly Hepatitis B in physicians; ulcer, hypertension, overweight and cardiovascular diseases in managers; zoonotic diseases such as brucellosis and anthrax in veterinarians; and all psychosomatic diseases in referees due to the tension and stress they are exposed to when officiating a game [21-23].

Erişen [24] suggested that physical education teachers who keep standing and speaking for a long time by the nature of their profession have an increased risk for varicose and voice, chest and orthopedic diseases and suffer from hoarseness and edemas, nodules and polyps in voice cords very often. It was recommended that teachers give up the habit of clearing the throat so frequently and instead, they should take a sip of water to relieve their throats. At least ten glasses of water should be consumed daily. They should stay away from menthol drops and pastilles that might cause the vocal cords to dry and they should avoid from caffeinated, spicy and acidic food and drinks that increases the secretion activity in vocal cords; they should do their best not to stay in dry-air environments for a long time and they need to moisturize their environments; and they need to rest their voices by keeping silent for some time when they have their voice very tired. Özkan [25] warns teachers not to keep standing and not to keep motionless for a long time. Recommending those who have to keep standing that way to move their feet like keeping the beat with the music, Özkan suggested that such moves are effective in preventing both varicose and clotting in veins. It is also recommended that raising the legs up to a level higher than the head to rest them when possible would be very effective vis-à-vis varicose. Şener [26] suggested that keeping in standing position would cause lumbar pain and feet pain in physical education teachers and recommends teachers not to wear high-heel shoes but to wear soft-base shoes with a wider nose; and added that, as teachers who write on the blackboard for a long time might suffer from muscle contraction in shoulders and therefore shoulder pain, teachers are recommended not to write on the blackboard over their head level, to be assisted by students in erasing the board and not to carry heavy loads. Karadağ [27] stated that it is a significant risk for respiratory system to live in closed environments as crowds in winter time and if classrooms are not ventilated sufficiently, the polluted air will pose a significant threat; and suggested that chalk powder, odorous pens and chemicals coming from glues might result in dyspnea and coughing and indoor environments should be frequently

ventilated to minimize the above-mentioned risks. Temel *et al.* [28] analyzed microbiologically the wipe samples taken from the toilet and lavatory faucets, door handles and telephone handsets in a primary school in Altındağ district and suggested that frequently-touched places such as toilets, lavatory faucets and door handles pose a high risk for contagious diseases. Varekamp *et al.* [29] found that, when appropriate employment is ensured, after a follow up for 24 months, self-efficacy of subjects with chronic physical diseases increases and their fatigue scores go down by four points compared to the control group. Alessio [30] stressed that early precautions and evaluation of health impacts vis-à-vis occupational risks are important as well as traditional clinical approaches. Nakata [31] researched into the impact of long working hours and insufficient sleep on full-time male workers of small and medium sized enterprises and found that workplace accidents decrease when workers sleep well for 6 to 8 hours a day whereas workplace accidents increase when the sleeping time is less than 6 hours a day. Yang *et al.* [32] conducted a study on the occupational deformation-related factors among Chinese teachers and concluded that occupational deformation is correlated to psychology and teachers' diseases are listed as stress-related chronic diseases and physical problems. In a study conducted about occupational diseases in Korea, Kang *et al.* [33] reported pneumoconiosis as the most common occupational disease in 1980s. It was also stated that the use of many chemical substances starts to increase due to industrialization since 1970 and as a result, occupational diseases caused by toxic chemicals such as heavy metal poisoning, solvent poisoning and occupational asthma became very common in late 1980s.

As a conclusion, physical education teachers had higher incidence of occupational diseases (musculoskeletal systems, neurological, cardiovascular and respiratory than teachers of other branches. The following can be recommended for improvement of teachers' health: trainings to develop mental ways to compensate high occupational, psychological and social tempo and regular seminars to improve their sports, health and nutrition habits. They should translate all these into behavioral changes and they set a role model for physical and mental improvements.

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