

How difficult is it to diagnose and report an occupational disease in a developing country? A modified delphi study

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ABSTRACT

Aim: The roles of occupational medicine specialists are very important in the diagnosis and notification of occupational diseases. In this regard, the opinions of the parties are needed to identify the problems and propose solutions.

Methods: This is a Modified Delphi exercise. It was conducted through an online survey in 2 rounds in Turkey between June 4, 2021 and August 31, 2021. The population of the research consists of occupational medicine specialists and sub-branch students in Turkey and some physicians working in the central organizational units of the Ministry of Health and the Ministry of Labor and Social Security regarding the diagnosis, registration and notification of occupational diseases. In both rounds, e-mails were sent to 127 people. The survey was sent via , and the response frequency was 27.5% and 18.1% in rounds 1 and 2, respectively. A survey form was created for the second round by evaluating the open-ended information obtained as a result of the first round using the thematic analysis method and making suggestions. This form was sent to participants via e-mail and questions were asked about participation in the proposals in the second round. Proposals with 70% or more participation were accepted unanimously.

Results: The most important difficulties regarding the diagnosis and details of occupational diseases are; The lack of a national occupational disease surveillance system, the fact that the current occupational disease diagnosis and summary system is focused on pricing, and the difficulties people experience in diagnosis were determined.

Conclusion: In order to increase the reporting of occupational diseases, a surveillance-oriented system should be switched instead of a compensation-based system. In addition, the deficiencies in manpower, financing, technical infrastructure and legislation in the occupational disease reporting system need to be rapidly revised.

Keywords: Occupational disease, diagnosis, recording, reporting, notification.

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INTRODUCTION

Occupational disease, as defined by the World Health Organization (WHO), is the common name of diseases that are related to exposure to factors in the workplace environment [1]. The International Labor Organization (ILO); defines occupational diseases as diseases contracted as a result of workplace exposures [2]. According to the ILO, 2 million people die every year in the world due to working conditions. About 6300 workers die from work-related causes every day, of which 5300 are due to work-related diseases. ILO also estimates that there are 160 million non-fatal work-related diseases [2].

It is obligatory to record and report occupational diseases in Turkey. According to the laws, every physician who suspects an occupational disease is obliged to refer the patient to an authorized hospital. These hospitals are; occupational disease hospitals, university hospitals and training and research hospitals. When these hospitals diagnose a patient with an occupational disease, they are authorized and obliged to notify the Social Security Institution (SSI), which is the only institution that receives these notifications. SSI evaluates an occupational disease decision, regulates the compensation and explains the number of indemnified cases per year. Neither workplace physicians nor other physicians working in primary or secondary care have the authority to notify SSI directly [3,4].

The number of occupational diseases is expected to be between 0.4 and 1.2 percent of employment, globally [5]. According to SSI data in our country, it is seen that occupational accidents are at significant levels, and the number of occupational diseases is much lower than expected [6]. According to the estimations, the number of occupational diseases should be between 64,040 and 192,120 in 2019, however, it was announced as 1088 [7]. There are also loss of data that are not reflected in the SSI statistics and occur as a result of work accidents and occupational diseases that are not covered and are not notified. In addition, it is known that the data on occupational diseases are only from the cases that have been decided to be compensated. The number of medical diagnoses of occupational diseases have not yet been collected and announced in Turkey. These statistics show that are problems in the detection and notification

of occupational diseases, and that result-oriented preventive work should be done in this direction.

Opinions and roles of the occupational health professionals working in the field of diagnosis and notification of occupational diseases are very important. In this respect, the opinions of the parties are necessary in order to determine the problems in the diagnosis and notification of occupational diseases and to propose solutions. In this research, we aimed to evaluate the opinions of the professionals working in this field in Turkey and to reach a consensus on the solutions on this issue. Therefore, we aim to understand the problems and possible solutions about underreporting of occupational diseases.

METHODS

This study is a modified Delphi type qualitative research. It was conducted in 2 rounds between 4 June 2021 and 31 August 2021 in Turkey, via online survey. The researchers who carried out the study are academicians and specialists in the occupational medicine specialty training program. As Delphi construction experts, the researchers carried out the study by forming the questions, determining the research group, evaluating the open-ended questions' answers and creating a questionnaire according to the themes.

The population of the research is occupational medicine training program trainers, specialists and subspecialty students in Turkey and some physicians working in the organizational units of the Ministry of Health and Ministry of Labor and Social Security related to the diagnosis, recording and notification of occupational diseases. No sample selection was made. The invitation to participate was sent to the entire universe via e-mail. The levels of reaching the universe are presented in Table 1 together with the socio-demographic information of the participants at each stage of the research. Questionnaires were sent to 127 people in both rounds, with a response frequency of 27.5% and 18.1%, respectively, in the 1st and 2nd rounds.

In the first round of the research, the researchers held a meeting in terms of basic content via online panel.

Open-ended questions were formed on the topics that are recommended to be included as priority in Turkey on the subject of diagnosis and notification of occupational diseases. The questionnaires were sent to the participants electronically (by sending 2 reminders per week) and a response was expected within 2 weeks. A questionnaire form was created for the second round by evaluating and classifying the open-ended information obtained as a result of the first round with thematic analysis method and forming propositions.

This form was sent to the participants via an online questionnaire and they were asked about their participation in the propositions in the 2nd round. Response was expected within 2 weeks (by sending 2 reminders per week) after the 2nd round questionnaire was sent. Propositions with 70% or more participation were accepted as consensus (8).

Ethics committee approval was received from Hacettepe University Non-Interventional Clinical Research Ethics Committee (04.05.2021, GO 21/483). Informed consent was obtained from the participants before the survey.

RESULTS

The sociodemographic characteristics of the participants and their working status are summarized in Table 1.

Compensation-oriented system by the SSI (Consensus level (CL): 89.58%), hiding the occupational diseases due to dismissal, fear stigmatization, loss of income and similar concerns of the employee diagnosed with an occupational disease (CL: 86.46%), lack of occupational disease surveillance of the Ministry of Health (MoH) and not being active in the diagnosis and notification processes (CL: 84.38%), insufficient knowledge and experience of physicians working in primary and secondary healthcare on occupational diseases (CL: 82.29%), and inability to diagnose occupational diseases (CL: 80.21%), lack of an institutional strategy of Ministry of Health regarding the employment of occupational medicine specialists (CL: 81.25%), the lack of recognition of the occupational medicine specialists in the field (CL: 80.21%), the low number of occupational medicine specialists (CL: 76.04%), employees hesitancy to apply for the diagnosis of occupational disease due to the long and difficult diagnosis and notification processes (CL: 75.0%), lack of qualified manpower and testing utilities for the diagnosis of occupational disease in authorized health institutions (CL: 75.0%), not performing standard and appropriate periodic examination follow-ups in the workplace (CL: 73.96%), and insufficient training on occupational diseases in the medical education processes (CL: 69.8%) are obstacles and weaknesses in our country, regarding diagnosis and notification of occupational diseases. Although it is thought that there are difficulties in diagnosis due to the necessity of a health committee

Table 1. The sociodemographic characteristics of the participants and their working status

		1st Round (n=35)	2nd Round (n=23)
Gender	Female	%45,7 (n=16)	%43,4 (n=10)
	Male	%54,3 (n=19)	%56,6 (n=13)
Age	(Mean±SD)	48.8 ± 10.6	49.5±10.7
Education	Faculty of Medicine	%20,0 (n=7)	%30,4 (n=7)
	Specialty in Medicine	%42,8 (n=15)	%56,5 (n=13)
	Subspecialty in Medicine	%22,8 (n=8)	%4,3 (n=1)
Specialty Area	Pulmonary Medicine	%40,0 (n=5)	%53,8 (n=7)
	Public Health	%46,6 (n=7)	%30,8 (n=4)
	Internal Medicine	%13,4 (n=1)	%15,4 (n=2)
Institution	University	%51,4 (n=18)	%52,1 (n=12)
	Ministry of Health	%22,8 (n=10)	%13,0 (n=3)
	Ministry of Labor	%5,7 (n=3)	%4,3 (n=2)
Position	Program coordinator and lecturer	%45,7 (n=16)	%39,1 (n=9)
	specialty in Medicine	%14,2 (n=5)	%8,6 (n=2)
	Subspecialty Fellow	%17,1 (n=6)	%21,7 (n=5)

SD: Standard Deviation

report for the diagnosis of an occupational disease, therefore it is among the obstacles and weaknesses of diagnosis and notification of occupational diseases, a sufficient level of consensus on this issue has not been achieved (CL: 66.7%).

The development of occupational medicine specialty training programs and the increase in the number of competent occupational medicine specialists (CL: 78.13%), the employment of occupational physicians and other health personnel in workplaces (CL: 73.96%), the fact that occupational diseases are an open field for scientific research (CL: 72.92%) are strengths and opportunities regarding diagnosis and notification of occupational diseases in our country.

The approval of the ILO conventions and agreements on occupational health and safety and occupational disease by Turkey and structuring the legislation (Law No. 6331) (CL: 68.75%), the presence of hospitals authorized to diagnose occupational diseases (occupational hospital, training and research hospitals, universities, etc.) (CL: 65.63%), the obligation of recording and notification of occupational diseases in the workplaces (CL: 62.50%), the presence of the Association of Occupational Medicine Specialists (CL: 60.42%), contribution of the related institutions and organizations (unions, universities, associations, non-governmental organizations) to the diagnosis, recording and notification of occupational diseases (CL: 59.38%), emerging of occupational diseases as a current issue during pandemic (CL: 59.38%), increasing awareness of physicians in this area (CL: 56.25%), increase in occupational hygiene measurement opportunities (CL: 55.21%), having a good information technology infrastructure in the field of occupational health and safety (CL: 50.00%), having an open list in the diagnosis of occupational disease (CL: 46.88%) are considered as strengths and opportunities regarding diagnosis and notification of occupational diseases, however, there is no consensus among the participants on these issues.

About the aspects that need to be developed in our country regarding diagnosis and notification of occupational diseases, it has been suggested by the participants that different systems should be developed for diagnosing occupational diseases for informal sectors (CL: 83.33%), an occupational health institute should be established (CL: 79.17%),

and the association of occupational medicine specialists should work more actively in professional organizations (CL: 76.04%).

Solution proposals agreed by the participants regarding the legislation (scope, definition, etc.) in the diagnosis and notification of occupational diseases are; standardizing the definition of occupational disease for the public and private sectors (CL: 88.54%), developing an algorithm for the diagnosis of occupational diseases and updating the occupational diseases list (CL: 86.46%), increasing the authority of occupational medicine specialists to diagnose occupational diseases (CL: 83.33%), removing the disability condition for the diagnosis of occupational disease (CL: 80.21%), developing a mandatory quota system to increase the employment of patients diagnosed with an occupational disease (CL: 76.04%), and giving incentives to those who employ workers diagnosed with an occupational disease (CL: 72.92%), the determination of the health institutions authorized to diagnose occupational diseases according to the needs in their regions (CL: 84.38%) and incentives to the workplace physicians who make occupational disease referrals and those who prepare patient files (CL: 76.04%). Increasing the awareness and knowledge level of employers on work accidents and occupational diseases and developing approaches to prevent them from refraining from reporting work accidents and occupational diseases (CL: 88.54%) are the solutions for the roles of employers in the diagnosis and notification of occupational diseases, according to the participants.

Solutions for the roles of OHS professionals in the diagnosis and notification of occupational diseases are; occupational health and safety (OHS) professionals' awareness to perform their duties in accordance with national and international standards (CL: 88.54%), the support of scientific research in workplaces (CL: 87.50%), and working with different institutions to promote the field (Ministry of Labor and Social Security, The Ministry of Health, universities, etc.), and making efforts together (CL: 84.38%), ensuring professional independence (CL: 82.29%), and paying their wages through a public audit fund to be established by employers (CL: 76.04%).

Suggestions for solutions agreed by the participants regarding the roles of employees and unions in the diagnosis and notification of occupational

diseases are; increasing the awareness and level of knowledge of employees on sector-specific occupational diseases (AL: 89.58%) and ensuring a good union organization in terms of occupational safety and health (CL: 87.50%).

According to the participants, problems related to employment conditions and macroeconomic conditions in the diagnosis and notification of occupational diseases are; the workers diagnosed with occupational diseases are not preferred for employment due to the increase in unemployment (CL: 81.25%) and increase in informal work due to the increase in vulnerable groups (immigrants, etc.) (CL: 80.21%). A consensus was reached on the establishment of vocational rehabilitation programs (CL: 87.50%) as a solution proposal.

Solution suggestions regarding the SSI system and its applications in diagnosis and notification of occupational diseases are; facilitating bureaucratic practices (CL: 89.58%), taking a more active role in vocational rehabilitation and return to work (CL: 81.25%), and to have another decision-making authority other than compensation at the stage of diagnosing occupational diseases (CL: 81.25%).

Suggestions for workplace inspections in diagnosis and notification of occupational diseases are; to increase the number of labor inspectors originating from health personnel (CL: 90.63%), compliance inspection of workplace health surveillance (CL: 88.54%) and occupational hygiene measurements (CL: 87,50%), regular inspections in workplaces where no notification of work accidents and occupational diseases are made (CL: 86.46%) and improvement of income and working conditions of labor inspectors (CL: 76.04%).

Suggestions for health and workplace surveillance in diagnosis and notification of occupational diseases are; establishment of a follow-up system for occupational safety and health monitoring and workplace surveillance (CL: 90.63%), increasing and disseminating occupational hygiene laboratory facilities (CL: 87.50%), providing training to OSH professionals on this subject (CL: 87.50%) and standardization of workplace measurements and health surveillance by developing guidelines (CL: 86.46%).

Solution proposals for manpower in the field of OSH in diagnosis and notification of occupational diseases are; increasing the number of qualified OSH

professionals (CL: 86.46%), training of occupational health nurses (CL: 86.46%) and technicians (CL: 83.33%).

In general, there are several deficiencies and insufficiencies in each authorized institution regarding the adequacy and accessibility of subjects such as manpower, laboratory and technical equipment required for the preliminary diagnosis or diagnosis of occupational diseases (CL: 77.08%).

All propositions and consensus levels are given in Appendix.

DISCUSSION

In this study, the absence of a national occupational disease surveillance system and the compensation-oriented process of the current occupational disease diagnosis and notification system, the difficulties experienced by the employees in the diagnosis-notification process of the occupational diseases (preparation of a health board report) and their concerns (dismissal, stigma, loss of income, etc.) have been identified as the most important difficulties regarding to diagnosis and notification of occupational diseases. Problems and obstacles in the occupational disease diagnosis-notification system are schematized and presented in Figure 1.

Diagnosis and notification of occupational diseases

Many European Union countries have national registry systems where occupational diseases are registered and reported. In addition, some countries have established additional surveillance systems [8,9]. In most European Union countries, national systems are linked to social insurance systems established for compensation for occupational diseases [10]. Therefore, the progress of diagnosis and notification of occupational diseases through the social insurance system is not unique to our country. However, in this situation, where the experts participating in our research have reached the highest level of consensus, the compensation-oriented data collection systems are insufficient to provide the data required for the preventive approach for occupational diseases. Therefore, many international occupational health experts recommend using additional and complementary

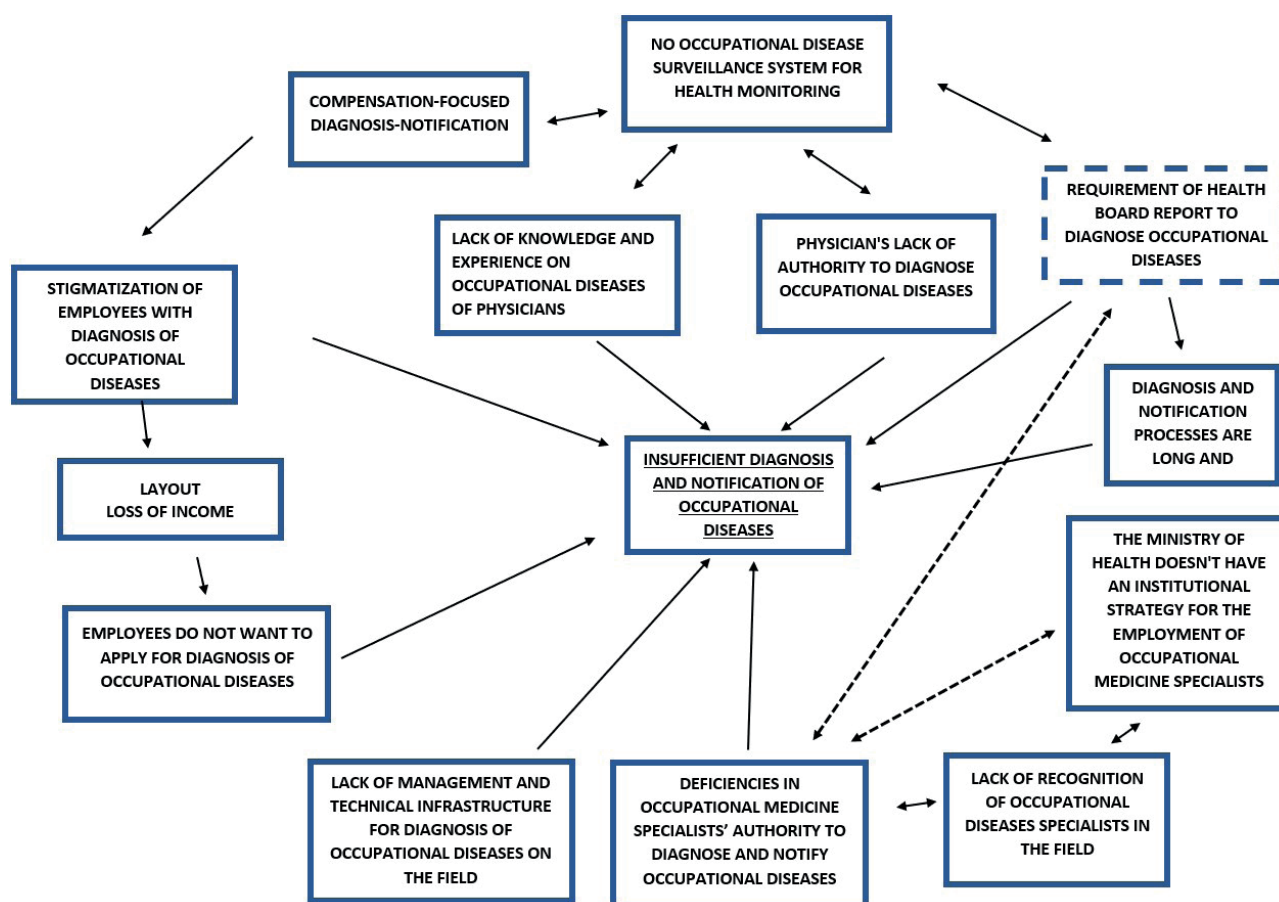


Figure 1. Problems in the diagnosis and notification system

surveillance systems that will provide the necessary data to evaluate occupational health conditions and understand health effects, necessary to prevent occupational diseases [10-12]. For example, reporting systems designed for a scientific purpose, such as Finland and the UK, were found to be more successful in monitoring occupational diseases when compared to countries using compensation-based systems [13]. In addition, compensation-oriented surveillance systems make cross-country comparison impossible [9]. *The Ministry of Health's lack of occupational disease surveillance system and insufficient involvement in the process* statement draws attention here, in which a consensus was reached between the participants under obstacles and weaknesses section, in our research. Indeed, it is important for the Ministry of Health to develop a prevention-oriented surveillance system, in cooperation with the relevant parties, in order to solve the problem. For example, the MALPROF surveillance system implemented in Italy is not focused on compensation, but aims to detect and prevent occupational diseases and work-related diseases early. In this system, all physicians can make a preliminary diagnosis of occupational

disease directly, and the insurance institution re-evaluates those in need of compensation. For this, centers have been established throughout the country and necessary technical and manpower infrastructure has been provided [14]. It is important to facilitate the diagnosis and notification processes of occupational diseases, to prepare the technical infrastructure and to train qualified physicians who are capable of diagnosing occupational diseases in order to establish similar surveillance systems.

Training of physicians on occupational diseases

The inability of physicians to diagnose occupational diseases and their insufficient knowledge and experience on this subject are among the important findings of our study. This situation shows that the training of physicians is very important for the reporting of occupational diseases, as emphasized in other studies [15,16]. In a study conducted in European Union countries, it was observed that there were deficiencies in the involvement of physicians in the diagnosis and notification processes. However, it has been observed that there is a need to improve the training of these notifying physicians [13]. In another study, it

was recommended to conduct a more intensive communication process in order to ensure the participation of these physicians and to increase the compliance of the reporting physicians within the system. To achieve this, it has been proposed to provide training, financial incentives and practical support [10]. In a campaign to increase the awareness of physicians, trainings were provided and notification forms were introduced to familiarize physicians with notification procedures. Interestingly, although these trainings provide benefits in the acute period, they lose their effects in the long term [17].

In this context, in our research, the development of occupational medicine specialty training programs and the spread of physicians with this expertise is emphasized and a consensus has been reached. This situation is similar in many developed countries, but occupational medicine training is required for physicians in other specialties [10]. Because the participation of all physicians in the occupational disease notification process has been deemed necessary for a good notification system structurally [9,18]. In a study, it was determined that there is a high rate of non-reporting among workplace physicians [19]. Another study, when examining the diagnosis and notification processes of occupational physicians, showed that these practices can be improved with information support, training and practical tools [10]. To this end, developing evidence-based guidelines for the use of physicians in notification processes and educating physicians to use them will increase the quality of occupational disease reporting [10]. Such guidelines will also serve to prevent the aggravation of occupational diseases [20].

Considering all these points, it is important that occupational medicine specialists receive a good training and become widespread in health services. This situation creates an opportunity to increase the awareness of other physicians working in tertiary health services. However, among the topics with a high level of consensus *"the lack of an institutional strategy of the Ministry of Health regarding the employment of occupational and occupational diseases specialists"* and perhaps as a result of this *"Lack of recognition of the field of occupational and occupational diseases expertise in the field"* are important problems. Occupational medicine specialization is a fragile field and it is in danger of

losing its effectiveness unless their employment and personal rights are supported [21,22].

In addition to all these difficulties, employees may not want to be diagnosed with an occupational disease because they are faced with many problems such as dismissal, stigma, and inability to maintain employment after being diagnosed with an occupational disease [23]. For this reason, it is necessary to take some public measures to prevent employees from being disadvantaged after being diagnosed with an occupational disease.

Roles of the government, employer and employee in the diagnosis of Occupational Diseases

In the section of solution proposals for the roles of the employer, a high level of consensus was achieved on the propositions: *"Awareness and knowledge levels of employers should be increased on work accidents and occupational diseases"* and *"Solutions should be found to prevent their hesitation from reporting work accidents and occupational diseases"*. In a study on this situation, the importance of examining and detecting the behaviors of employers and employees that will prevent recording and notification, as well as studies on the behaviors of physicians related to occupational diseases, was emphasized [13]. Because the preference of the employee/patient is as important as the awareness of the physician in the notification of occupational disease [24]. As one of the employer-related situations, it has been shown that the employer avoids reporting due to fear of punishment [25].

One of the issues in which a significant level of consensus was reached in our research is the proposition that *"an employee diagnosed with an occupational disease may hide his/her occupational diseases due to dismissal, stigma, loss of income and similar concerns"*. This was particularly emphasized in a review that highlighted the barriers to reporting occupational diseases [23]. In several studies investigating the lack of reporting in occupational skin diseases, it has been shown that stigma and fear of losing one's job after diagnosis prevented occupational disease reporting [25,26].

One of the important issues, on which a consensus was reached in our research, was solution proposals related to the legislation (scope, definition, etc.)

in the diagnosis and notification of occupational diseases. A high level of consensus has been achieved in almost all propositions under this heading. This shows that there is indeed a need for improvement in this regard. However, it should be noted that strict rules and regulations do not result in an improvement in the reporting of diseases unless good communication is provided. The low number of occupational diseases is an indicator of this situation [27]. For example, in many countries where notification of occupational diseases is legally required, notification of occupational diseases is very insufficient [28]. Moreover, systems that require a health board report during the notification and compensation processes place the burden of proof on the patient, creating a new obstacle in reporting [28]. However, it is certain that eliminating the deficiencies and contradictions in the legislation regarding scope and notification will contribute positively to the notification of occupational diseases.

In our research, there were 3 main topics on which a high level of consensus was reached; the Roles of Occupational Health and Safety Professionals, Workplace Inspections and Workplace Health and Ambient Surveillance. A high level of consensus on all propositions on these topics reveals the importance of health and safety services, practices and supervision in the workplace. In another study, inadequacy of workplace ambient measurements, inadequacy of workplace inspections and insufficient periodic examinations in the workplace were determined as important conditions that prevent the reporting of occupational diseases [29].

Vocational rehabilitation, which is one of the areas on which a consensus has been reached, is of great importance in terms of indirectly contributing to the diagnosis. Vocational rehabilitation includes important steps such as restoring working capacity and returning to work after the diagnosis of an occupational disease [30]. In the studies carried out, it is seen that especially in cases where the understanding of the social state is not sufficient, employees lose their jobs, only because they are diagnosed with an occupational disease [31]. For this reason, rehabilitating the employees after the diagnosis of occupational diseases and bringing them back to working life is more important than the treatment approach [32]. It is necessary to

protect the employees from unemployment that arises directly or indirectly due to the diagnosis of occupational disease with adequate legal regulation. It can be predicted that after vocational rehabilitation, when both the working conditions of the employees are improved and there are no problems with unemployment or being out of employment with protective legislation, the concerns of the employees about being diagnosed with an occupational disease will disappear, so they will not hesitate to apply for an occupational disease diagnosis. Thus, in the diagnosis and notification of occupational diseases, physicians will be able to refer more patients and a system will be established for the benefit of the employee.

CONCLUSION

Occupational diseases are expected to be more common in developing or underdeveloped countries due to the shifting of risky jobs during the globalization process. Access to occupational health services may also be more restricted. This study presents the difficulties of diagnosing occupational diseases in a developing country, which is already difficult in many countries. The results of this study emphasize the importance of diagnosing occupational diseases in the and the necessity of establishing a system in terms of providing preventive occupational health services. Special efforts are needed to support occupational disease diagnosis systems in developing and underdeveloped countries. In order to increase the reporting of occupational disease diagnosis, instead of a compensation-based system, a surveillance-oriented system should be adopted. In this way, abstinence of employers and employees from receiving an occupational diagnosis can be prevented. In addition, the deficiencies in the manpower, financing, technical infrastructure and legislation in the occupational disease notification system should be revised quickly.

The fact that our study is a qualitative study, taking the opinions of the participants and analyzing them in detail offers a new perspective on this subject. In our study, only taking the opinions of those working in this field created a limitation. A larger study can be conducted with the participation of employees in different fields of expertise.

Author contribution

Study conception and design: İK, MEA, CŞ, and ANY; data collection: İK, CŞ and ANY; analysis and interpretation of results: İK, MEA, CŞ ; draft manuscript preparation: İK, MEA and CŞ. All authors reviewed the results and approved the final version of the manuscript.

Ethical approval

The study was approved by the Non-Interventional Clinical Research Ethics Committee of Hacettepe University (GO 21/483, 04.05.2021).

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Conflict of interest

The authors declare that there is no conflict of interest.

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