

Prefer Parameters of Occupational Health Surveillance System (OSS) in Expert Opinions of Occupational Staffs: A Qualitative Study

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ABSTRACT

Occupational Health Surveillance System (OHSS) provides a critical opportunity to monitor and evaluate occupational disorders and injuries over the time. Among more than 21 million employees in Iran, 62.08% and 38.03% had been worked in the industrial and private sections respectively. Present qualitative study was designed for collection of expert opinion of staffs in this field and determined proper characters of suitable Iranian OHSS. Present qualitative study was performed on an interview based on data from occupational medicine staffs. Some questions about OHSS definition, temporary accompaniment of occupational diseases and injuries surveillance system, OHSS promoters and consumers, type of requested data for OHSS and rewarding and controlling systems to prepare qualitative and valid OHSS data. Interview answers were read, summarized and presented. Most of study participants' staff believed that OHSS in the scientific base must cover all of essentially its parts including disorders, hazards and accidents together. They believed that this combination was made by a team working with occupational medicine staffs and other specialties such as occupational hygienist and information technologists. They emphasized that the Iranian ministry of health had the capacity to promote OHSS and organizing executive committee with all of OHSS involved as team working in this field. Occupational staff had been focused on this fact that OHSS data must cover all of needed data of Iranian working population and their relatives. Iranian occupational registry system must be change and develop as Occupational Health Surveillance system according the main parameters which were found in occupational staff interview.

Key words: Interview; Occupational Medicine; Occupational Staff; Parameters; Surveillance System, ASTM: American Society for Testing and Materials

INTRODUCTION

Occupational Health Surveillance System (OHSS) is defined as an ongoing and systematic occupational data gathering, analysis, and interpretation of data which might be related to occupational exposures or adverse health outcomes, including injuries, diseases or disorders [1]. In the other hand in this system, focuses on health policymakers are on diseases and/or injuries that are either caused, or made worse by, engaging in work and productive activity. OHSS provide a critical opportunity to enforce training and education of employees in the workplace. Early detection of adverse effects at the workplace can improve employer's knowledge about their workplace and health/injury risk among their employers.

The Islamic Republic of Iran, according to the report of the National Statistic center in Labor Force Participation rate among the total population and men (more than 10 years) was 41% and 64.7%

respectively. In the same time, unemployment rate among the total population and men were 10.4% and 8.6% respectively. Among more than 21 million employers in Iran, 62.08% and 38.03% had been worked in the industrial and private sections respectively. In 2014, 12358 accidents were occurred and 12402 employers were infected [2]. Unfortunately, Iranian working population had no systematic, web based system for online monitoring occupational disorders and accidents.

There is only one national registry system for gathering results of annual occupational examination of employees and reporting their accidents into the health deputy of universities in the provinces and finally sent to environmental and occupational health center at the heathy deputy of Iranian ministry of health and medical education. It seems that the current registry system of occupation disorders/accidents can be improved and update according to national and standard system for

monitoring of occupational health to achieve better health situation in this field. Expert opinion of Iranian occupational medicine staff in medical universities is one of the fundamental source for OHSS updating and present qualitative study was designed for collection of expert opinion in this field and determined the main characters of suitable Iranian OHSS.

MATERIALS AND METHODS

Present qualitative study was performed between February and July 2016 on interview based data from occupational medicine staffs in five university of medical sciences including Tehran (n=7), Iran (n=6), Shahid Sadoughi (n=7), Mashhad (n=3) and Hormozgan (n=2) which had occupational medicine as training group. According our study protocol, we performed the study in three phases, at the first phase of the study, investigators search on the literature including PubMed, Web of science and Scopus and instructions of international organization such as International labor organization (ILO), world health organization (WHO) and other national /international organization for finding related documents to field of our study. Authors according study search strategies, used Surveillance AND (Occupational OR work related) AND (character OR parameter OR specification) as search keyboard for search engines and reviewing all of notifications, instructions and information in the websites of ILO, WHO and other official organization. According that we found 549 papers in PubMed, 201 papers in web of science and 214 papers in Scopus. In the second phase of the study, we read and summarized their findings of literature searching and prepared one deep interview form with nine open questions for only collection of expert opinion of the included staffs. In this form, definition and idea of including staff about occupational surveillance term were asked at the first question. In the second question, we ask about temporary accompaniment of occupational diseases with accidents in one system or in two separating systems. OHSS founder and executive were asked in the third question and in the fourth question interviewer ask the staffs to encounter Iranian OHSS consumers. Type of data that would be collected in occupational diseases/accident fields via OHSS were asked as fifth questions. Sixth and seventh questions were related to encouragement and controlling systems to prepare qualitative and valid OHSS data. Investigator in the eight-question asked about type of reports that would be prepared by OHSS and in the last question questions interviewer want to know opinions of the staff about the use of surveillance data in some related fields such as rehabilitation and compensation for the workers. Interviewer only ask

questions from them and record their answers with sound recorder and in each of the answer did not present his idea about the question or answers of the participated staffs. Questions of the deep interview form were presented in Table 1. In the third phase of the study, we collected and summarized responses of study staff into the one conceptual model for better describing the ideas of study participants in one graphical figure. Study conceptual model was sent to the study participants and approved by all of them.

Table 1: summary of study interview form for gathering opinions of occupational staff

Number	Question details
1	Concept or definition of OHSS
2	Contemporary making occupational disorders and injuries surveillance system
3	Persons or organizations who were promoter OHSS
4	Persons or organizations who were consumer of OHSS data
5	Kinds of data for occupational disorders or injuries which will gather for OHSS
6	Type of rewarding systems which will use for OHSS
7	Type of controlling systems which will use for OHSS
8	Type of reports which will make for OHSS
9	Use of OHSS data for prevention, compensation and rehabilitation

Statistical analysis

All of recorded answers of questions which were asked from medical staff were heard several times and then summarized and classified in nine parts and were presented in the results section according distribution frequency and percentages. Finally, in this study we use descriptive group method for prioritizing of the main characters of OHSS and inserted all of them into one executive summary together.

RESULTS

In answer to our first interview question about OHSS concepts, occupational staffs focused on the basic concepts on their text book as systematic and ongoing collecting, interpreting of occupational health data and lastly designing interventions for improving occupational health indices. Most of the study participants had been focused on the OHSS as monitoring and screening system for occupational disorders/hazard and systems. In answer to the second question about temporary preparing occupational disorders, hazards and accidents together, twelve staffs had focused on this matter and believed that OHSS had not established without that. Other staffs think that preparing three parts of occupational surveillance need to more equipment, budget and programs which were established in the same time. One of staffs said that occupational disorders must select via international instruction such as world health organization guidelines. Two of other staffs believed that we must separate

elementary OHSS data according role of health care workers in occupational health system. In the other hand, occupational medicine specialist must focus on the disorders and occupational health hygienist focused on the hazard surveillance system in the two separate and related system. Occupational staffs focused on the problem of the current Iranian occupational health registry system due to lack of its system integrity. On the other hand, they added that occupational disorders registers were in the ministry of health but their related accident collected separately in law ministry without some strategy for data gathering. They said that some parts of occupational accidents were related to the human safety and is in the field of the ministry of health. In about promoter of OHSS and in answer to the fourth question of the study interview, eleven staffs believed that the ministry of health is the main parts due to governmental structure of our healthcare system. Nine staffs think that we must have an establishment committee and all of OHSS participants either governmental or non governmental must participate into the committee and other five staffs said that one separated governmental organization is needed for coordinating of the OHSS establishment process. Most of staffs believed that we had most parts of OHSS, but lack of integrity and similar strategies causes this fact that we encounter different behaviours with the same events between responsible organizations. Frequency of OHSS promotor among opinions of occupational staff were illustrated with Fig.1.

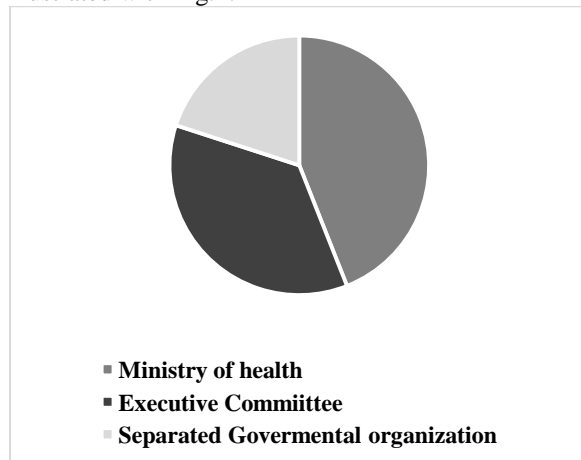


Fig. 1: Frequency of OHSS promotor among opinions of occupational staff

Although, we had different ideas about OHSS funder and parts, all of study staffs believed that all of the occupational health member from employees in small workplace to occupational health policymakers are known as OHSS consumers. They believed that we need to prepare a suitable guideline to cover diagnosis and screening parts of occupational disorders. Although we had collected occupational data among annual occupational examinations, national research projects had much budget for recollection of occupational data among occupational centers. In other part of interview, we want staffs to say their ideas about OHSS data type and twelve of them think that OHSS data type must be determined according Iranian occupational health need and collecting only standard occupational surveillance data did not sufficient and other five occupational staff believed that standard (epidemiological) staff is suitable and sufficient for Iranian OHSS. Five staffs believed that more than occupational data some of general disorders with high prevalence among Iranian general population must be collected in the OHSS. Three staffs say that occupational staffs must more attention to train elementary occupational data to residents and according that we can have to improve and qualitative occupational data.

All of study occupational staffs had a census on the reward systems for gathering OHSS data via different methods. Some staffs say that giving responsibility of data gathering in each part to their main consumers such as giving accident surveillance data gathering to the insurance system is suitable reward method. Others said that OHSS data collectors must rank and employers had been selected high rank personnel or organization for gathering qualitative and valid occupational data. Some of controlling system such as random reassessment of occupational data was suggested for validity control of occupational data. We prepared a conceptual model which cover main comments of study participants and noted model were approved by study participants.

In third study phase, we design one conceptual model for covering main responses of study staff to study interview questionnaire and all of staff reviewed the conceptual model and conformed that. The conceptual model which cover main comments of study participants was presented in Fig..2.



Fig. 2: Conceptual model for covering main opinions of occupational staff

DISCUSSION

Most of the study participants staff had been defined OHSS as same as the textbook of occupational medicine and they added OHSS in the scientific base must cover all of essentially its parts including disorders, hazards and accidents together. They believed that this combination was made by a team working with occupational medicine staffs and other specialties such as occupational hygienist and information technologists. They emphasized that the Iranian ministry of health had the capacity to promote OHSS and organizing executive committee with all of OHSS involved as team working in this field. Occupational staff had been focused on this fact that OHSS data must cover all of needed data of Iranian working population and their relatives. We know that OHSS provide an estimation of the extent and distribution of occupational disorders. Injuries and hazards and capable health policy makers to monitor changes in the occupational health field over time. Occupational health in the overall has close relation with general population wellbeing. Workers who were encountered with poor working condition can cause large human and material loss in exposure to hazards [3]. Noted situation had to side impacts on national productivity and economics and in the other

side, quality of life and general health among workers and their families [4,5]. Although OHSS development among the working population is not simple task and need to detail knowledge of different filed such as occupational hygiene, information technology and public health, it is necessary that health policymakers had an immediate focus on OHSS development.

There are a number of potential sources of data for surveillance systems [6]. These include employers, workers, medical practitioners and other health workers, interested organizations such as trade unions or employee groups, government departments or organizations, and private sector groups such as insurers. Data can be collected at the level of the enterprise, the industry, a region, or an entire nation [7-11]. Occupational safety and health surveillance systems collect, analyze and disseminate relevant information about hazards found in the workplace, as well as for work-related diseases and injuries. Surveillance systems identify where the problems are and are not, how frequent the problems are, whether they are increasing or decreasing, and whether prevention efforts have been effective. The public health and occupational health communities rely on

surveillance information to set priorities for prevention.

Finding relation links between occupational disorders and exposures is one of the challenging parameters [12] and several occupational diseases can be caused by work can also be caused by non-occupational exposures, and these cannot usually be distinguished on clinical grounds. It is suggested that specific epidemiological studies must conduct at a group or population level, in order to establish statistical relationships including absolute risk or relative risk between exposure and the condition(s) under consideration [13]. Success or failure of preventive or control programs is assessed with comparing OHSS acquiring data with data of noted epidemiological studies in different age or sex groups [14]. The most effective method of monitoring exposures is at the level of the individual, although it is also possible, but less desirable, to conduct monitoring at the level of the industry, workplace, or occupational group.

OHSS must have some way of tracking the individual from one workplace to the next. Most existing injury surveillance systems could probably be enhanced through improving the definition of populations at risk, hazard monitoring, injury process and event coding, reporting of health outcomes, analyzing causal factors, expanding the coverage of fatality monitoring, and developing better intervention strategies and evaluation techniques [15,16]. Surveillance systems describe where occupational injuries or illnesses are occurring, how frequent they are, whether they are increasing or decreasing, and whether our prevention efforts have been effective [17]. A general improvement in the range and usefulness of the statistical information base on occupational injuries and disease has occurred since the 1990s [18]. The most common OHSS report consumers are public health workers, government officials, data providers, and clinicians [19]. The public health community tends to rely on surveillance information to set research and prevention priorities, but any critical gaps in existing systems might limit their usefulness. It seems that most surveillance systems originally arose somewhat opportunistically when it became practical to acquire potentially relevant data. In the first instance, this occurred when a system was established to collect data for administrative or financial purposes. These are "data-driven" models of surveillance. They have singular strength in as much that they are feasible. However, they are fundamentally weak because the data may be incomplete and may lack relevance and basic reliability (e.g. inexpert coding by clerical staff).

In some studies, workplace surveillance system was suggested as another option to achieve occupational health. There is common believe that workplace

surveillance can assess health and safety hazards in the workplace [20]. Up to our searching the literature, there is not census on the minimum requirement for designing surveillance system. In most of the cases, epidemiologist in surveillance system try to estimate severity of occupational disorders/injuries as one of OHSS markers and encounter with different challenges. On the other hand, more than multifactorial nature of occupational disorders/injuries, there is no consensus on the meaning and definition of severity and according that, we need to make some combination and generic variables for regular uses in OHSS.

There are few studies in the literature that present useful statistics about Iranian working population and their disorders or accidents due to lack of national and applicable surveillance system. However, there are two million work units in Iran with more than 16 million employees including service workers (45%), agricultural workers (30%) and industrial workers (25%) [21]. Unfortunately, occupational injuries remain an important problem in Iran and in under reporting is occurred in preparing national occupational injuries reports. It is estimated that we have annually 20,000 workers with occupational injuries especially in industrial provinces such as Tehran and Isfahan [21]. Surveillance data may come from publicly funded by governments and quasi-governmental organizations. Its expense is justified on a variety of grounds ranging from compliance with legislation and international treaties, through to prevention ideals and these activities do often exist in the private sector. Non-governmental funded such as employers, unions, health professionals and institutions, and others using various methods to track illnesses, injuries, and hazards for the purpose of prevention and control activities. Occupational disease is a challenging area for designing OHSS [22-25] and according that currently available information on occupational disease is generally quite poor. By contrast, occupational accidents/injuries are often more overt and more easily identified with causes, unless they are the gradual onset in nature. It is clear that many of these systems do need to be updated and expanded, and new systems and methodologies need to be developed. Data from these systems may then effectively contribute to the recognition and elimination of work-related morbidity and mortality. The prevention of occupational disease and injury depends on the implementation of a variety of activities, including testing chemicals and tools before they are introduced into commerce, using engineering controls and personal protective equipment to limit exposures, and providing early diagnosis and effective therapy of injured or ill

workers to minimize disability when preventive measures have failed.

CONCLUSION

According to study conceptual model, OHSS is performed as registration system in Iran and can develop by Iranian health ministry for covering occupational disorders, injuries and hazards. All of needed data for Iranian working population must gather in OHSS and were used by all of the people in the occupational medicine filed. Rewarding and controlling systems must be used for better OHSS performance. Next studies will suggest for designing suitable instruction for designing and practical test of OHSS in Iran.

ETHICAL ISSUES

Study protocol as PhD student tez (94-01-127-25817) was approved in research ethical committee of Iran University of medical science.

CONFLICT OF INTEREST

None

AUTHORS' CONTRIBUTION

Amir Bahrami-Ahmadi: data collection
Elaheh Kabir-Mokamelkhah: study design and approving final draft of the manuscript);
Jalil Kuhpaizadeh: Study design and supervise the study protocol
Leila Ghalichi: Study design and supervise the study protocol
Mashallah Aghilinejad: Study design and supervise the study protocol

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REFERENCES

[1] Pearce N, Mannetje A. Occupation in routinely collected national health data. Report to the New Zealand Health Information Service Wellington: Centre for Public Health Research, Massey University. 2004.
[2] Valizadeh S, Hosseinzadeh M, Mohammadi E, Hassankhani H, M Fooladi M, Schmied V. Addressing barriers to health: Experiences of breastfeeding mothers after returning to work. *Nursing & health sciences*. 2017;19(1):105-11.
[3] Chen G, Johnston J, Alterman T, Burnett C, Steenland K, Stern F. Expanded analysis of injury

mortality among unionized construction workers. *Am J Ind Med*. 2000;37(4):364-73.

[4] Measuring the economic burden of occupational fatal injuries in the United States. 1990-95. National Occupational Injury Research Symposium; 2000 October 17-19, 2000; Pittsburgh, PA. NOIRS.

[5] Petridou E, Dessypris N, Frangakis CE, Belechri M, Mavrou A, Trichopoulos D. Estimating the population burden of injuries: a comparison of household surveys and emergency department surveillance. *Epidemiology*. 2004;15(4):428-32.

[6] Provencher S, Labreche FP, De Guire L. Physician based surveillance system for occupational respiratory diseases: the experience of PROPULSE, Quebec, Canada. *Occupational and environmental medicine*. 1997;54(4):272-76.

[7] Watson WL, Ozanne-Smith J. Injury surveillance in Victoria, Australia: developing comprehensive injury incidence estimates. *Accident; analysis and prevention*. 2000;32(2):277-86.

[8] Dement JM, Pompeii LA, Ostbye T, Epling C, Lipscomb HJ, James T, *et al*. An integrated comprehensive occupational surveillance system for health care workers. *Am J Ind Med*. 2004;45(6):528-38.

[9] Zuckerbraun NS, Powell EC, Sheehan KM, Uyeda A, Rehm KP, Barlow B. Community childhood injury surveillance: an emergency department-based model. *Pediatric emergency care*. 2004;20(6):361-66.

[10] Sznajder M, Chevallier B, Yacoubovitch J, Aegerter P, Auvert B. Implementation of a system of surveillance of childhood injuries involved in a Safe Community program: the example of Boulogne-Billancourt (France). *Injury prevention : journal of the International Society for Child and Adolescent Injury Prevention*. 2002;8(4):330-31.

[11] Struttman TW, Scheerer AL. Fatal injuries caused by logs rolling off trucks: Kentucky 1994-1998. *Am J Ind Med*. 2001;39(2):203-08.

[12] Sundin DS, Pedersen DH, Frazier TM. Occupational hazard and health surveillance. *American journal of public health*. 1986;76(9):1083-94.

[13] Boyle D, Bender A, Williams A, Brunner W. Occupational Cancer Surveillance through Record Linkage.; 2001.

[14] Berberich SG, Surveillance of Injuries in Agriculture, National institute of occupational safety and health, 1992

[15] Hanrahan LP, Moll MB. Injury surveillance. *American journal of public health*. 1989;79 Suppl:38-45.

[16] Stout N., International collaborative effort on occupational injuries: the USA perspective;. . The 7th

World Conference on Injury Prevention and Safety Promotion; 2004 June 6th-9th 2004; Vienna Austria

[17] Jenkins E. Fatal injury surveillance. Workplace health surveillance: an action-oriented approach.; N.A. Naizlish, 2000: 213-218.

[18] Halperin WE, Ordian DL. Closing the surveillance gap. *Am J Ind Med.* 1996;29(2):223-24.

[19] Spirtas R, Sundin D, Sestito J, Behrens V, French J. Conceptual Framework for Occupational Health Surveillance, NIOSH, DHEW (NIOSH) publication; no. 78-135; 1978.

[20] Braddee R, Myers J. Logging-Type Fatalities in the U.S. Production Agriculture Industry 1980-92. *J Agromed.*4(34):373-75.

[21] Vige M, Mazaheri M. Occupational medicine in Iran. *Occupational medicine.* 2009;59(1):66.

[22] Mundt KA. Epidemiological surveillance: a management tool for occupational health. *The Journal of ambulatory care management.* 1994;17(2):19-27.

[23] Rutstein DD, Mullan RJ, Frazier TM, Halperin WE, Melius JM, Sestito JP. Sentinel Health Events (occupational): a basis for physician recognition and public health surveillance. *American journal of public health.* 1983;73(9):1054-62.

[24] Froines JR, Dellenbaugh CA, Wegman DH. Occupational health surveillance: a means to identify work-related risks. *American journal of public health.* 1986;76(9):1089-96.

[25] Halperin WE. The role of surveillance in the hierarchy of prevention. *Am J Ind Med.* 1996;29(4):321-23.