

Original Papers

Absenteeism metrics for risk assessment concerning illness and injury in the medical-social assistance units

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Abstract

Objective. This study aimed to provide the true picture of a ten-year absenteeism survey with regard to work-related illnesses and injuries in medical-social workers, and to develop an analytical model for the occupational health practitioner to facilitate record linkage between health outcomes and occupational data.

Methods. Severity indicator and specific weight indicator were calculated on the basis of sick leaves evidence from seven care facilities, as well as the average lost days per year within the period 2008-2017. Four types of work-related illnesses, non-reported accidents and five occupational groups accounted for statistic modeling of data.

Results. According to the specific weight indicator for occupations, nurses ranked the first place for musculoskeletal disorders, respiratory and cardiovascular diseases, and traumatic injuries, followed by medical-social-educational staff. Severity indicator for musculoskeletal disorders was high correlated with the number of employees ($r=0.66$).

Conclusions: This analytical method is reliable to be applied in risk assessment procedures and occupational health expertise.

Keywords: *absenteeism, work-related illnesses, medical-social workers, risk hierarchy*

Introduction

According to the Romanian legislation [1], the main categories of residential care facilities for persons with disabilities are as follow: centers for care and assistance; centers for recovery and rehabilitation; centers for occupational therapy; emergency shelters; and sheltered housing / group home. At the district level, these institutions are subordinated to the General Directorate for Social Assistance and Child Protection and are jointly funded by national government and local authorities. Types and level of support provided to persons with disabilities in the European Union varies from country to country,

but assistance with performing daily tasks and psychological support are the common practices which have been identified [2]. The care provided in this economic subsector is a mix of health and social services, and medical social workers typically work with other disciplines such as medicine, nursing, physical, occupational, and recreational therapy, psychotherapy and counseling. Beneficiaries are persons with mental, psychosocial, physical and sensory disabilities (e.g. blind, or deaf) often having an unpredictable behaviour with a particular potential for violence. According to the OSHA (Occupational Safety and Health Administration), members of the healthcare and social service professions are among

those at the greatest risk for violence in the workplace [3]. Effects of violence on workers include: physical injuries; frequent symptoms such as disturbed sleeping patterns, irritability, anxieties and loss of appetite; possible patterns of disorders, such as depression, anxiety states, amnesia without brain damage, pain not attributable to physical causes and substance abuse [4]. In addition, high physical loads such as lifting and carrying persons with physical disabilities may result in stress and mental fatigue. Nearly all groups of medical social workers are involved in manual handling of loads: medical staff, nurses, service staff, back-up staff, kitchen staff, cleaners, laundry workers and suppliers. According to the WHO, musculoskeletal disorders (MSDs) represent a main cause of absence from occupational work [5]. Work environment and performance of work may contribute significantly to other disorders than occupational diseases, as one of the several causative factors, translated into work-related diseases, as described by the ILO (International Labour Organization) in 1993. A complete definition of work-related health problems and illnesses was given in 2008 as “those health problems and illnesses which can be caused, worsened or jointly caused by working conditions. This includes physical and psychosocial health problems. A case of work-related health problem and illness does not necessarily refer to recognition by an authority and the related data shall be collected from existing population surveys” [6].

The purpose of our research is to use the analysis of multiannual absenteeism in risk management of injuries and occupational illnesses, and to set a more objective hierarchy of the occupational groups that are significantly exposed in the medical-social assistance units by comparing the engineering assessment method with the evidence-based medical method.

Material and Method

A cross-sectional study was designed for 605 workers selected from seven care facilities for persons with disabilities meeting the following criteria: (1) similar professions in all institutions, namely medical-social-educational staff, nurses, kitchen staff, laundry women and administrative personnel; (2) common work tasks involving physical and psychical stress in long-term care of adults with severe disability; (3) existing sick leaves evidence in the last ten years (2008-2017).

Our workflow consisted in directly documentation

(I), analysis of temporary work disablement (II), and statistic modeling of data (III).

I. Job description of medical-social worker: mainly, the work process consists in assistance with performing daily tasks, personal assistance, psychological support, occupational therapy, educational and recreational activities, health care and medication, and evaluation. We have consulted the Report on “Systemic analysis and risk assessment concerning work-related accidents and diseases” (document available at the Occupational Health and Safety Department) performed by assessors for five workplaces, namely: medical-social-educational staff, nurses, kitchen staff, laundry women and administrative personnel (office and managerial staff and auxiliary workers). This assessment consists in the identification of all risk factors of the system (workplace) under examination, based upon pre-established check lists, and the quantification of the risk dimension, taking into account the combination between the severity and the frequency of the maximal foreseeable consequence [7]. Workplace assessment card is a relevant final document, including the partial risks levels for each risk factor and the global risk level for the workplace. Some partial risk factors may result in irreversible consequences such as invalidity or decease, and the share (%) of these factors was considered in the present paper.

II. Analysis of temporary work disablement (TWD): under the general data protection regulation, the number of TWD days according to medical diagnosis codes and according to workplaces was extracted from the annual evidence of sick leaves within the period 2008-2017 (available at the Human Resources Department of each centre). In order to estimate the risk of illness, diagnosis codes suggestive for work-related diseases - respiratory diseases, cardiovascular diseases, MSDs and mental disorders - have been taken into account. The codes for traumatic injuries were considered to estimate the risk of accidents. No cases of work-related accidents or occupational illnesses have been officially reported in any of the seven centres selected for this study.

Severity indicator (SI) and specific weight indicator (SWI) for TWD days were calculated according to the following formulas [8]:

Indicator:	Formula:	Meaning:
SI	$\frac{\text{No. of TWD days} \times 100}{\text{Average No. of employees}}$	Shows how many TWD days (disease burden or group of diseases) are assigned to 100 employees.
SWI	$\frac{\text{No. of TWD days for a certain disease} \times 100}{\text{Total No. of TWD days}}$	Shows the percentage of TWD days for a certain disease (or group of diseases).

III. Statistical modeling of data: the Microsoft Excel correlation function was used for continuous or discrete quantitative variables and the following values of the correlation coefficient r were considered:

$r = [0 - 0.2]$ – very low correlation, no correlation

$r = [0.2 - 0.4]$ – low correlation

$r = [0.6 - 0.8]$ – high correlation

$r = [0.8 - 1]$ – very high correlation (meaning very close relationship between variables or calculation error).

Results

The seven institutions objecting this study are located in Sibiu County and are numbered from 1 to 7 to ensure anonymity in Table 1, which shows SI per year according to the group of diseases. Regarding the activity of these units, centers no. 1, 2, 3 and 7 are recovering and rehabilitating adults with severe neuromotor and neuropsychiatric impairment; centers no. 5 and 6 are performing occupational therapy for young adults with disabilities; and centre no. 4 provides care for the elderly (previous beneficiaries of the other centers).

Table 1. SI values (%) and the average number of TWD days per year in the seven centers

Unit	Center 1	Center 2	Center 3	Center 4	Center 5	Center 6	Center 7	TOTAL
Average no. of employees	100	50	141	80	50	50	134	605
Average no. of TWD days for respiratory diseases	103.7	7.3	28.3	19.9	4.2	38	172.9	374.3
SI - respiratory diseases	103.7	14.60	20.07	24.88	8.40	76.00	129.03	61.87
Average no. of TWD days for MSDs	170.4	8.4	79	4.2	2.5	6.1	194.8	465.4
SI- MSDs	170.4	16.80	56.03	5.25	5.00	12.20	145.37	76.93
Average no. of TWD days for cardio-vascular diseases	203.4	4.2	3.0	4.1	14.8	1.8	77.7	309
SI - cardiovascular diseases	203.40	8.4	2.13	5.13	29.60	3.60	57.99	51.07
Average no. of TWD days for mental disorders	57.2	14.8	2.7	3.6	0	5	18.8	102.1
SI - mental disorders	57.2	29.60	1.91	4.5	0	10	14.03	16.88
Average no. of TWD days for injuries	36.1	3.9	0	33.6	22.7	7.5	111.1	214.9
SI - injuries	36.1	7.80	0	42.00	45.40	15.00	82.91	35.52
Average no. of TWD days for 1 year	570.8	38.6	113	65.4	44.2	58.4	575.3	1466
SI	570.8	77.20	80.14	81.75	88.40	116.80	429.33	242.26

By comparing the rate of medical absenteeism between units, it can be noted that SI takes the highest values in the centers of recovery and rehabilitation for adults with severe neuromotor and neuropsychiatric

impairment. TWD for mental disorders was registered in six out of the seven centers. The SI for MSDs is significant correlated with the number of employees, as shown in Table 2.

Table 2. Value of the correlation coefficient (r) between the average number of employees from each center and SI according to illnesses

Severity indicator	Correlation coefficient	Type of correlation
SI - respiratory diseases	0.42	positive reasonable
SI- MSDs	0.66	positive high
SI - cardiovascular diseases	0.24	positive low
SI - mental disorders	0.02	no correlation
SI - injuries	0.25	positive low

As a specific indicator showing the structure of TWD morbidity, IS has the advantage that it can be calculated according to occupations, as shown in Table 3. Based on this indicator, we could determine which occupational group is at highest risk for illness and injury and, moreover, for which distinct diseases (Table 4). We have assimilated the code for traumatic

injuries with the risk of accident due to overload working in general, without reference to potential work-related accidents because there was no evidence on this issue. Table 4 also shows the comparison between our results and the results of the authorized risk assessor (% of risk factors with irreversible consequences).

Table 3. SWI values (%) and TWD days within the period 2008-2017, according to occupational groups

	Laundry woman	Cook	Nurse	Medical, social, educational	Administrative personnel	TOTAL
Total units						
No. of TWD days for respiratory diseases	286	286	1259	1205	707	3743
SWI - respiratory diseases	1.95	1.95	8.59	8.22	4.82	25.54
No. of TWD days for MSDs	471	183	2397	868	735	4654
SWI - MSDs	3.21	1.25	16.35	5.92	5.01	31.75
No. of TWD days for cardiovascular diseases	586	489	810	747	458	3090
SWI - cardio-vascular diseases	4.00	3.34	5.53	5.10	3.12	21.08
No. of TWD days for mental disorders	187	32	193	253	356	1021
SWI - mental disorders	1.28	0.22	1.32	1.73	2.43	6.97
No. of TWD days for injuries	289	112	713	616	419	2149
SWI - injuries	1.97	0.76	4.86	4.20	2.86	14.66
Total TWD days						14657
SWI						100

Table 4. Risk dimension according to occupational groups for work-related diseases and accidents

Risk level	High 1	Medium 2	3	Low 4	5
% of risk factors with irreversible consequences	Laundry woman	Cook	Nurse	Medical, social, educational	Administrative personnel
	52.63%	42.11%	42.11%	37.14%	35.57%
% of TWD days for a certain disease (SWI)	Respiratory diseases, MSDs, injuries				
	Nurse	Medical, social, educational	Administrative personnel	Laundry woman	Cook
	Cardiovascular diseases				
	Nurse	Medical, social, educational	Laundry woman	Cook	Administrative personnel
	Mental disorders				
	Administrative personnel	Medical, social, educational	Nurse	Laundry woman	Cook

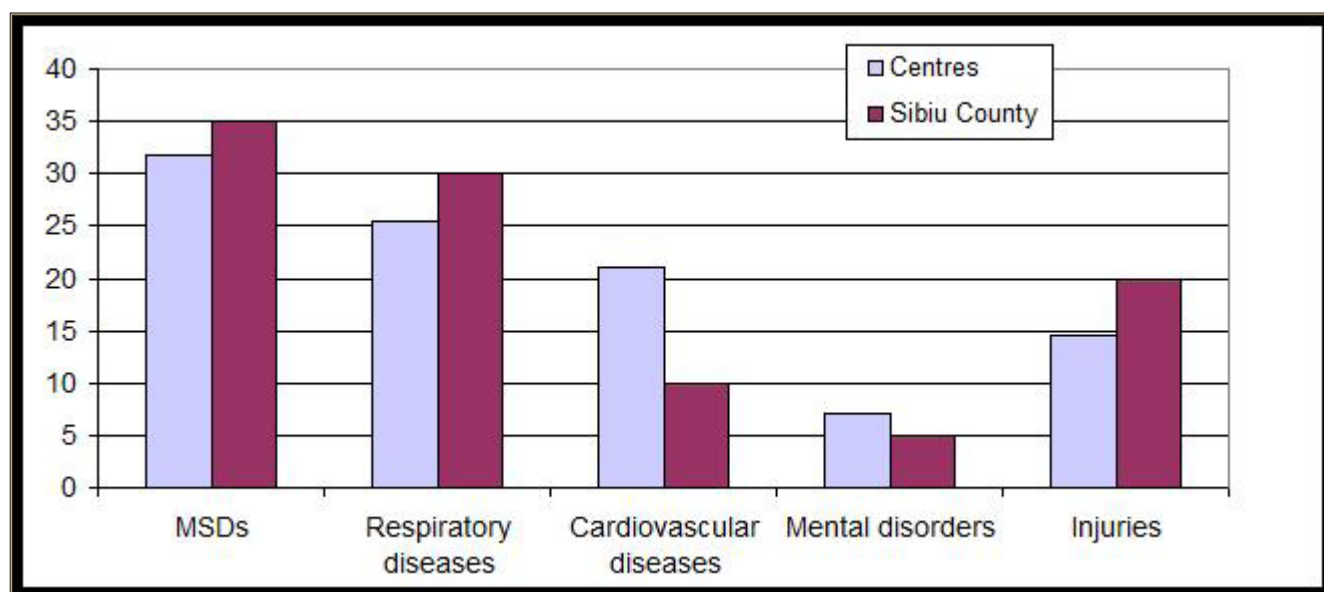


Figure 1. Comparative values of SWI (%) between the studied Centers and Sibiu County

Since we had access to the 2017 statistical data of the Sibiu County [9], we compared the SWI values found in the seven centers with the SWI values calculated at the county level ($N = 21733$ employees reported from the industrial sector), as shown in Figure 1. On average, in Sibiu County the absenteeism for a possible work-related illness or injury resulted in 5.6 TWD days per employee during 2017.

Discussion and Conclusions

Social workers have a significant role in ensuring the wellbeing of people with special needs, and their methods of intervention require specialized skills in using a bio psychosocial model in understanding health, illness, and health care delivery [10]. Our results concerning the health status of these workers are significant for work-related MSDs ($r=0.66$), especially in nurses ($SWI=16.35\%$). MSDs have well-documented associations with occupational ergonomic stressors such as repetitive motion, heavy lifting, non-neutral postures, but also with organizational features of the work environment such as time pressure and low decision latitude [11]. Despite the lack of standardized exposure metrics, the epidemiologic evidence on work-related MSDs is convincing [12]. On the other hand, MSDs rank the first place in the 2017 national statistic report on occupational diseases, including the case of a cook with carpal tunnel syndrome [13]. Among the occupations in the health and social care sector, nurses rank the first place in occupational morbidity,

47.8% according to a Polish study [14]. In the present paper we suggest occupational diseases are absolutely undervalued in the medical-social facilities, because no case has been reported so far in Sibiu County.

An important issue we wish to highlight hereby is the absenteeism due to mental disorders – depression, anxiety, and reaction to stress factors – accounting for an annual average of 102 TWD days and 7% share of the illnesses subjecting this paper. Surprisingly, the highest absenteeism metric was found in administrative staff, probably due to unsafe working conditions, lack of variety in tasks performed, or unsupportive workplace culture. These workers may develop short term disability and there is evidence that physical and psychosocial risk factors are associated, meaning that people with mental health problems are more likely to have poor lifestyle behaviors such as smoking, poor diet, physical inactivity, low rates of preventive screenings, and poor safety habits [15]. It is known that female professionals constitute the majority of the employees in social work and are more likely to report depletion of emotional reserves [16].

Comparing our results with the 2017 statistical data of Sibiu County we found SWI for musculoskeletal diseases (31.7% vs 35%) and mental disorders (7% vs 5%) was close to the county one; SWI for cardiovascular disease was two fold higher in medical-social workers than in industrial workers (21% vs 10%), which highlights the significant impact of stress in the social assistance sector.

The method based on absenteeism metrics, particularly SWI, allowed us to set the hierarchy of the occupational risk groups for work-related

diseases, namely: nurse > medical-social-educational staff > administrative staff > laundry woman > cook. Our conclusion varies sensitively from the results of the authorized assessor, but we consider that work-related diseases, which are more frequent than occupational diseases, are scientifically a more convincing expression of risk in the workplace.

Acknowledgments: The authors are grateful to the managerial staff for kindly support.

Disclosure Statement: The authors report no conflicts of interests.

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