




Occupational dermatoses in the Brazilian South region recorded in a reporting system (2007 to 2016)

Dermatoses ocupacionais registradas em sistema de notificação na região Sul do Brasil (2007 a 2016)

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ABSTRACT | Background: Occupational dermatoses must be mandatorily reported in Brazil. **Objective:** To characterize the reporting of occupational dermatoses in the Brazilian South region, and describe the profile of the involved workers. **Method:** Retrospective and descriptive study of 396 cases of occupational dermatoses reported from 2007 through 2016 via the Information System for Notifiable Diseases. **Results:** 3.6 and 2.2 cases / 10,000 workers / year were of men and women, respectively. The highest incidence of occupational dermatoses corresponded to age range 50 to 64 years old, 1.8 cases / 10,000 workers / year, and to maintenance and repair workers, 3.6 cases / 10,000 workers / year. Most cases involved whites (77%) and workers not having completed elementary school (37.6%). Patch testing was only performed for 11.4% of cases. **Conclusion:** Reinforcing measures to promote the use of personal protective equipment is necessary, as well as to improve reporting and sensitize professionals to perform accurate reports in official systems.

Keywords | dermatitis, occupational; occupational health; health information system; epidemiology.

RESUMO | Introdução: As dermatoses ocupacionais são doenças de notificação compulsória no Brasil. **Objetivo:** Caracterizar a notificação das dermatoses ocupacionais no Sul do Brasil e descrever o perfil desses trabalhadores. **Método:** Descritivo, retrospectivo de 396 casos de dermatoses ocupacionais entre 2007-e 2016 no Sistema de Informação de Agravos de Notificação. **Resultados:** Em relação ao sexo, houve 3,6 casos a cada 10 mil trabalhadores/ano do sexo masculino e 2,2 casos a cada 10 mil trabalhadores/ano do sexo feminino. A faixa etária com maior incidência foi entre 50 e 64 anos, com 1,8 caso a cada 10 mil trabalhadores/ano. Destacaram-se os trabalhadores de manutenção e reparação, com 3,6 casos a cada 10 mil trabalhadores/ano. Em relação à raça/cor, houve predomínio de trabalhadores brancos (77%); já a escolaridade mais acometida foi entre trabalhadores com Ensino Fundamental incompleto (37,9%). O teste de contato foi realizado em apenas 11,4% dos casos. **Conclusão:** Torna-se necessário reforçar medidas para o uso de equipamentos de proteção individual, bem como aprimoramento das notificações e sensibilização dos profissionais de saúde para o registro correto nos sistemas oficiais.

Palavras-chave | dermatite ocupacional; saúde do trabalhador; sistemas de informação em saúde; epidemiologia.

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INTRODUCTION

Occupational dermatoses (OD) are among the main work-related disorders, and according to the Brazilian public health authorities must be mandatorily reported¹. The number of cases of OD is unknown in most countries due to lack of differential diagnosis enabling the establishment of a relationship between disease and work².

Defining the causes of OD requires accurate knowledge of the factors to which workers are exposed in the workplace, as well as of individual factors likely to influence their development^{3,4}.

Chemicals, which cause irritant contact dermatitis, are among the main causes of OD. According to estimates, they account for about 80% of cases, manifestations including acute, subacute or chronic inflammation, and affecting mainly the upper limbs, the hands in particular. The main complications of OD are secondary infection, disorders of pigmentation, scarring, physical or emotional sequelae, reduced or limited productivity, and temporary or permanent incapacity for work¹⁻⁴.

While in Brazil contact dermatitis is a common reason to seek medical care², OD are seldom detected or attributed their due importance by physicians, who as a rule underestimate their morbidity and relevance as a public health problem¹. In addition, few studies were conducted in Brazil on the frequency of occupational skin diseases, their medical legal and social security repercussion, the length of and criteria to grant sick leaves, treatment received, and later return to work, rehabilitation or retirement^{5,6}.

Cases of OD are more frequent among workers in civil construction, metallurgy, food industry, agriculture, cleaning, and cosmetics and health⁵⁻⁸.

Reporting OD requires performing a careful occupational interview and physical examination to identify causative agents, and eventually also a visit to the workplace¹⁻³. Precise diagnosis is essential to distinguish OD from skin diseases of different origin, and understand the relationship between work, health and disease to establish an adequate therapeutic approach and give orientation on preventive and control actions⁹⁻¹².

A diagnosis of OD might be beneficial for workers, as confirmation of an occupational link ensures labor and

social security rights, in addition to enabling interventions in the workplace to protect the health of coworkers^{2,3,5}. The severity of OD, the cost of absenteeism, sick and other types of leave, medical legal examination, financial resources and time spent with tests, diagnosis, treatment and rehabilitation point to the relevance of primary prevention of dermatosis and health promotion as fundamental approaches to workers' health care⁹⁻¹³, as well as to reduce their impact on their productivity and quality of life¹².

To achieve a more thorough understanding of OD, the Brazilian Ministry of Health requires mandatory reporting via the System of Information for Notifiable Diseases (Sistema de Informação de Agravos de Notificação—SINAN)¹⁴. In 2017, Administrative Ruling no. 5—which consolidates the procedures for actions at healthcare services within the Unified Health System (Sistema Único de Saúde—SUS)—published the Normative Instruction on Occupational Health Surveillance; appendix LXXX brings a list of work-related skin and subcutaneous tissue diseases and corresponding etiologic agents and occupational risk factors¹⁵. For being based on the International Classification of Diseases (ICD-10) SINAN enables reporting all types of OD. In the report form OD are defined as “disorders of the skin, mucosa or adnexa directly or indirectly caused, maintained or aggravated by work. They might be related to chemicals, which occurs in 80% of the cases, or to biological or physical agents which cause irritation (most) or sensitization”^{1,3}.

We chose to conduct the present study in the South region of Brazil, as according to the World Health Organization (WHO) the Municipal Human Development Index (MHDI) is similar in all three corresponding states: Santa Catarina—0.774, Parana—0.749, and Rio Grande do Sul—0.746. This indicator affords a more accurate understanding of the regional situation¹⁶, pointing to similarities in the socioeconomic profile of all three Southern states. However, it is not yet possible to assert there is a relationship between OD and MHDI.

The aims of the present study were to characterize reporting of OD in Southern Brazil, and to describe the profile of the affected workers to achieve a more accurate understanding of illness, and contribute to the establishment of more efficacious preventive measures.

METHOD

The present retrospective and descriptive study was based on secondary data relative to reported cases of OD involving workers in the Brazilian South region. The study was approved by the research ethics committee of Universidade Positivo, ruling no. 667,595, in compliance with Resolution no. 466 / 2012.

Data were collected from SINAN for the period from January 2007 through December 2016. SINAN is an information system established by the Brazilian Ministry of Health for continuous recording of data on mandatorily notifiable diseases⁴. Data were extracted from a public domain website. Cases reported in the three included Brazilian states were analyzed and compared according to the following variables: year, age range, sex, educational level, ethnicity, occupation, involved body site, performance or not of diagnostic tests, causative agent, need for sick leave, clinical progression, and measures taken.

Incidence density (ID)—also known as incidence rate—is calculated by dividing the number of cases by the number of exposed individuals times length of exposure. The selected unit was 10,000 workers / year (wkr. / yr.). This index allows calculating the odds of an individual to develop a given disease^{17,18}.

Data analysis was performed using software Epi Info and Excel[®]. The data were described as absolute and relative frequencies for categorical variables, and as mean, median and standard deviation for continuous variables. ID was calculated according to Equation 1:

$$\text{ID} = \frac{\text{number of workers with occupational dermatoses} \times 10,000}{\text{Workers population (2010 Census)} \times 10 \text{ years}} \quad (1)$$

The unit used was 10,000 wkr. /yr.

The workers population was estimated based on the 2010 Brazilian Demographic Census¹⁹ for representing the analyzed period, in addition to being the standard population for this type of statistical calculation. The denominator corresponded to the number of economically active workers in the Brazilian South region times the targeted period of time (10 years).

RESULTS

We analyzed a total of 396 cases of OD involving workers in the Brazilian South region. The temporal progression of reports increased from 0.8% in 2007 to 29.5% in 2012, to then decrease to 6.3% in 2016, as shown in Table 1.

According to the data described in Table 2, the incidence of OD for the full South region was higher among males, 3.6 cases / 10,000 wkr. / yr. compared to females, 2.2 cases / 10,000 wkr. / yr. In regard to the individual states, difference according to sex was only found for Rio Grande do Sul, being the incidence higher among the men (4.6 cases / 10,000 wkr. / yr.).

The age of the involved workers varied from 15 to 84 years old. For the full South region, the highest incidence of OD corresponded to age range 50 to 64 years old, 3.6 cases / 10,000 wkr. / yr., followed by age range 35 to 49 years old, 3.0 cases / 10,000 wkr. / yr. In Parana, most cases corresponded to workers above 65 years old, 7.6 cases / 10,000 wkr. / yr., and in Rio Grande do Sul to age range 20 to 34 years old, 3.3 cases / 10,000 wkr. / yr. For Santa Catarina, there was no difference according to age range (workers aged 15 to 64 years old) with average incidence of 1.8 cases / 10,000 wkr. / yr.

Table 1. Distribution of occupational dermatosis reports in Southern Brazil from 2007 through 2016 (n=396).

Year	Parana		Santa Catarina		Rio Grande do Sul		Total	
	n	%	n	%	n	%	n	%
2007	1	0.5	1	1.7	1	0.7	3	0.8
2008	1	0.5	2	3.3	1	0.7	4	1.0
2009	2	1.1	2	3.3	0	0.0	4	1.0
2010	6	3.2	9	15.0	0	0.0	15	3.8
2011	37	19.6	3	5.0	8	5.4	48	12.1
2012	40	21.2	6	10.0	71	48.3	117	29.5
2013	32	16.9	10	16.7	31	21.1	73	18.4
2014	30	15.9	13	21.7	12	8.2	55	13.9
2015	31	16.4	8	13.3	13	8.8	52	13.1
2016	9	4.8	6	10.0	10	6.8	25	6.3
Total	189	100.0	60	100.0	147	100.0	396	100.0

Source: SINAN⁴.

For the full South region, the highest incidence corresponded to maintenance and repair workers, 7.6 cases / 10,000 wkr. / yr., followed by workers in the industrial production and service sector, 5.5 cases / 10,000 wkr. / yr. In Parana, cases predominated among industrial production and service workers, 5.5 cases / 10,000 wkr. / yr.; and in Santa Catarina and Rio Grande do Sul among maintenance and repair workers, 7.3 and 9.5 cases / 10,000 wkr. / yr., respectively, as shown in Table 3.

For the full South region, OD predominated among whites (n=305, 77.0%) followed by brown skinned workers (n=44, 11.1%) and blacks (n=18, 4.5%). Whites were most affected in all the three states: Parana, n=15 (79.9%), Santa Catarina, n=46 (76.7%) and Rio Grande do Sul, n=108 (73.5%) as shown in Table 4.

As described in Table 4, most cases were of workers who had not completed elementary school (n=150, 37.9%) followed by complete secondary school (n=86, 21.7%). These results were similar on separate analysis of each state.

For the full South region the distribution of involved body sites was as follows: hands (n=124, 31.3%), upper limbs (n=36, 9.1%), full body area (n=30, 7.6%), head / neck / chest (n=28, 5.3%), lower limbs / feet (n=13, 3.3%), other (n=123, 31.1%) and unknown (n=42, 10.6%).

Patch testing was performed for 45 (11.4%) cases only; in 228 (57.6%) forms this information was reported as unknown. The main causative agents involved were cement (n=45, 11.4%), rubber and organic solvents (n=26, 6.6%) and wood (n=17, 4.3%); for 212 cases (53.5%) causative agents were reported as "other"—this is an open-ended item in the report form. Other reported agents were cosmetics (n=9, 2.3%), plastic (n=7, 1.8%), resin (n=5, 1.3%), grease, nickel and chrome (n=2, 0.5%) and cutting oil (n=1, 0.3%). Agents were reported to be unknown for 44 (10.6%) cases only.

In regard to ICD-10 categories, dermatitis and eczema predominated (n=141, 35.6%), followed by other skin and subcutaneous tissue disorders (n=86, 21.7%) and effects of foreign body entering through natural orifice (n=82, 20.7%) as shown in Table 5.

Measures taken included change of job in 136 cases (34.3%) and in the organization of work in 52 cases (13.1%). Collective and individual protective measures were adopted in 32 (8.0%) and 189 (47.7%) cases, respectively. Only 53 cases (13.4%) required sick leave.

In regard to the progression of cases, 153 (38.3%) had confirmed cure and 58 (14.6%) non-confirmed cure, 56 (14.1%) temporary disability and eight (1.8%) partial or total permanent disability; progression was categorized

Table 2. Sociodemographic profile of workers with occupational dermatoses in the Brazilian South region reported via System of Information for Notifiable Diseases (SINAN) from 2007 through 2016 (n=396).

	Parana				Santa Catarina				Rio Grande do Sul				Total			
	n	%	Wkr. pop.	ID	n	%	Wkr. pop.	ID	n	%	Wkr. pop.	ID	n	%	Wkr. pop.	ID
Sex																
Female	106	56.1	2,977,179	3.6	32	53.3	1,880,660	1.7	35	23.8	3,042,431	1.2	173	43.7	7,900,270	2.2
Male	83	43.9	2,264,170	3.7	28	46.7	1,487,938	1.9	112	76.2	2,430,895	4.6	223	56.3	6,183,003	3.6
Total	189	100.0	5,241,349	3.6	60	100.0	3,368,598	1.8	147	100.0	5,473,326	2.7	396	100.0	14,083,273	2.8
Age range																
15-19	4	2.1	385,179	1.0	5	8.3	270,753	1.8	5	3.4	361,550	1.4	14	3.5	1,017,482	1.4
20-34	49	25.9	2,027,290	2.4	25	41.7	1,360,432	1.8	66	44.9	2,008,991	3.3	140	35.4	5,396,713	2.6
35-49	71	37.6	1,789,694	4.0	21	35.0	1,127,967	1.9	49	33.3	1,830,671	2.7	141	35.6	4,748,332	3.0
50-64	53	28.0	880,277	6.0	9	15.0	522,917	1.7	26	17.7	1,059,639	2.5	88	22.2	2,462,833	3.6
≥65	12	6.3	158,908	7.6	0	0.0	86,529	0.0	1	0.7	212,473	0.5	13	3.3	457,910	2.8
Total	189	100.0	5,241,348	3.6	60	100.0	3,368,598	1.8	147	100.0	5,473,324	2.7	396	100.0	14,083,270	2.8

Wkr. pop.: workers population according to the 2010 Brazilian Institute of Geography and Statistics (IBGE) Census; ID: incidence density. Source: SINAN⁴.

as “other” for 61 (15.4%) cases, and was not reported for 60 (15.2%). Work Accident Report (WAR) forms were issued for 245 (61.9%) cases, not issued for 65 (16.4%), did not apply for 20 (5.1%) and status was not reported for 66 (16.6%).

DISCUSSION

The increase of reports in 2012 (29.5%) is significant, as it might point to possible wider divulgation about disease, and sensitization of health professionals to reporting. However, the number of records decreased in later years, to reach 6.3% in 2016. The frequency of reporting might vary as a function of the extension and location of lesions, local economic and industrial characteristics, resources

available at health services, and training given to professionals on SINAN reporting^{1,14,15}. In addition, reporting requires adequate infrastructure and committed staff to make faithful reports.

OD were more frequent among workers aged 50 to 64 years old, which might be associated with their length in the job. We believe there might be a relationship between length in the job and occupation, however, in the present study we were not able to analyze the correlation between variables age and length in the job. Different from our results, the average age of the sample in a study with 818 cleaning workers performed in Spain was 45 years old⁹, and 47 in a study conducted in Brazil with 57 bricklayers⁷. These studies point to the prevalence of OD among the working-age population, and while they do not contradict our findings, our sample

Table 3. Profile of occupational dermatoses in the Brazilian South region reported via System of Information for Notifiable Diseases from 2007 through 2016 per major occupational group (n=396).

Brazilian Classification of Occupations	Parana				Santa Catarina				Rio Grande do Sul				Total			
	Major occupational groups	n	%	Wkr. pop.	ID	n	%	Wkr. pop.	ID	n	%	Wkr. pop.	ID	n	%	Wkr. pop.
Sciences and arts	8	4.2	500,863	1.6	3	5.0	276,451	1.1	4	2.72	511,061	0.8	15	3.8	1,288,375	1.2
Medium-level technicians	13	6.9	336,010	3.9	2	3.3	218,002	0.9	7	4.76	425,848	1.6	22	5.6	979,860	2.2
Administrative services	7	3.7	467,791	1.5	1	1.7	287,352	0.3	1	0.68	487,762	0.2	9	2.3	1,242,905	0.7
Services and sales workers	51	27.0	1,245,816	4.1	23	38.3	697,858	3.3	23	15.65	1,211,146	1.9	97	24.5	3,154,820	3.1
Agricultural, forestry and fishery workers	13	6.9	358,055	3.6	1	1.7	429,764	0.2	21	14.29	865,670	2.4	35	8.8	1,653,489	2.1
Industrial production and services	87	46.0	1,215,574	7.2	22	36.7	947,675	2.3	78	53.06	1,242,963	6.3	187	47.2	3,406,212	5.5
Maintenance and repairs	7	3.7	118,190	5.9	6	10.0	82,243	7.3	11	7.48	115,733	9.5	24	6.1	316,166	7.6
Unknown	3	1.6	0	0.0	2	3.3	0	0.0	2	1.36	0	0.0	7	1.8	0	0.0
Total	189	100.0	4,242,299	4.5	60	100.0	2,939,345	2.0	147	100.00	4,860,183	3.0	396	100.0	12,041,827	3.3

Wkr. pop.: workers population according to the 2010 Brazilian Institute of Geography and Statistics (IBGE) Census; ID: incidence density. Source: SINAN⁴.

was older, which might impair productivity and reduces the odds of later occurrence of dermatosis.

The male predominance found might be attributed to the tasks proper to civil construction and maintenance and repair of vehicles and industrial equipment. Calculation of

Table 4. Distribution of the absolute and relative frequency of ethnicity and educational level of workers with occupational dermatoses in the three Brazilian Southern states reported via System of Information for Notifiable Diseases (SINAN) from 2007 through 2016 (n=396).

	Parana		Santa Catarina		Rio Grande do Sul		Total	
	n	%	n	%	n	%	n	%
Ethnicity								
White	151	79.9	46	76.7	108	73.5	305	77.0
Black	5	2.6	4	6.7	9	6.1	18	4.5
Asian	0	0.0	2	3.3	0	0.0	2	0.5
Brown skin	17	9.0	6	10.0	21	14.3	44	11.1
Native	1	0.5	2	3.3	0	0.0	3	0.8
Unknown	15	7.9	0	0.0	9	6.1	24	6.1
Total	189	100.0	60	100.0	147	100.0	396	100.0
Educational level								
Illiterate	5	2.6	1	1.7	0	0.0	6	1.5
Incomplete elementary school	55	29.1	24	40.0	71	48.3	150	37.9
Complete elementary school	13	6.9	12	20.0	9	6.1	34	8.6
Incomplete secondary school	12	6.3	4	6.7	12	8.2	28	7.1
Complete secondary school	42	22.2	12	20.0	32	21.8	86	21.7
Incomplete higher education	0	0.0	0	0.0	4	2.7	4	1.0
Complete higher education	10	5.3	1	1.7	3	2.0	14	3.5
Unknown	52	27.5	6	10.0	16	10.9	74	18.7
Total	189	100.0	60	100.0	147	100.0	396	100.0

Source: SINAN⁴.

ID — which considers the number of exposed workers — allows asserting that incidence in the South region was highest among males. A study conducted in Brazil with civil construction workers found that dermatosis predominated among males⁷. Differently, in a study in Germany²⁰ that assessed dermatoses caused by acrylates and methacrylates, disease was most prevalent among women (53.12%) the reason being that the analyzed population was of beauticians.

Table 5. Distribution of the absolute and relative frequencies of reports of occupational dermatoses in the Brazilian South region (2007 through 2016) according to the International Classification of Diseases (n=396).

International Classification of Diseases (ICD-10)	n	%
Dermatitis and eczema (L20-L30)	141	35,6
Other disorders of the skin and subcutaneous tissue (L80-L99)	86	21,7
Sequelae of injuries, of Poisoning and of other consequences of external causes (T90-T98)	84	21,2
Unknown	25	6,3
Pedal cyclist injured in transport accident (V10-V19)	6	1,5
Motorcycle rider injured in transport accident (V20-V29)	6	1,5
Exposure to inanimate mechanical forces (W20-W49)	6	1,5
Event of undetermined intent (Y10-Y34)	6	1,5
Micoses (B35-B49)	4	1,0
Burns and corrosions (T20-T32)	4	1,0
Infections of the skin and subcutaneous tissue (L00-L08)	3	0,8
Urticaria and erythema (L50-L54)	3	0,8
Occupational exposure to other air contaminants (Z57)	3	0,8
Acute conjunctivitis, unspecified (H10.3)	2	0,5
Other	17	4,3
Total	396	100,0

Source: SINAN⁴.

The category of maintenance and repair workers exhibited the highest incidence of OD in the present and other studies^{6,21}. Probably these workers are inadequately or not protected against chemical hazards in the workplace, in addition to the fact they are poorly specialized or perform their jobs without previous training. It is worth noticing that workers' awareness of occupational hazards should be promoted, as they often ignore the sources of exposure.

Most cases of OD occurred among whites (77.0%). According to the literature, 78.2% of workers with OD are white¹¹. The explanation might be found in the Brazilian Demographic Census¹⁹, which shows that whites (47.7%) represent the largest proportion of residents in the South region.

Analysis showed that most cases of OD involved workers who had not completed elementary school (37.9%) followed by complete secondary school (21.7%). Within this context, it should be noticed that information on educational level lacked for 18.7% of the cases. Some studies indicate that variable educational level might influence occupational illnesses, absenteeism and incapacity for work^{2,22}. We believe that low educational levels hinder achieving an adequate understanding of the relevance of personal (PPE) and collective (CPE) protective equipment, however, further studies are needed to confirm this hypothesis.

According to the literature, the hands are the body sites most frequently involved in work-related injuries^{3,21}. In the present study, the largest numbers of reports concerned the upper limbs, the hands in particular. In a large number of reports the involved body sites were described as "other," which fact hinders an accurate analysis of the actual situation. Use of PPE might reduce or prevent exposure, in accordance with the legal recommendations in vigor. However, PPE might also cause lesions, and thus periodic examination to identify allergies associated with use of PPE is essential. Several studies indicate that the patch test is necessary to confirm suspected cases of dermatitis due to sensitization to chemicals such as metals²³⁻²⁷ and other^{1,3,5,7}. In the present study, only 11.4% of workers with OD were subjected to the patch test for diagnostic investigation. Probable reasons are predominance of irritative dermatitis, socioeconomic and attitude-related factors relative to workers or employers, and operational difficulties

for specific dermatological investigation. Then, we cannot rule out information and confounding bias, as skin lesions are common in the primary care setting, and the diagnosis established by general practitioners might differ from that of specialists.

A total of 13.4% of cases required sick leave, and 34.3% a change of job. International studies on OD prevention and rehabilitation indicate that leave and adequate treatment reduce the incidence of OD among affected workers. Leave helps minimizing disease, however, upon returning to work the affected workers should be reallocated, or interventions should be implemented to readjust them to their job to avoid further episodes of OD.

Healing occurred in 38.6% of the cases. There is a shortage of Brazilian studies on OD, their consequences and prognosis in social security, civil and labor terms, as well as on their impact on the quality of life of workers.

Use of PPE and CPE was recommended for 37.1% and 5.5% of the cases, respectively. Use of PPE and CPE is established in the labor legislation in force, such as the Regulatory Standard no. 6, which deals with use of PPE to reduce the risk of skin lesions derived from contact with chemicals in the workplace, including gloves, long-sleeve coats and closed footwear²⁸. WAR were issued for most cases of OD, which ensures the enforcement of the due labor and social security rights.

CONCLUSION

The present study shows that reporting OD requires sensitization of health professionals, given the relevance of this subject.

The profile of workers affected by OD in the Brazilian South region is characterized by males, aged 50 to 64 years old, with low educational level, white and working in maintenance and repair. The most common conditions were dermatitis and eczema involving the upper limbs, the hands in particular, which are treatable and heal in most cases.

The quality of the information in systems like SINAN depends on several human and organizational factors, including aspects related to the structure of the health system, which might be improved through general and specific planning policies. Reporting is legally mandatory

and demands commitment from professionals, being necessary to the planning of actions for prevention, health promotion, diagnosis, treatment, rehabilitation and epidemiological surveillance.

Further studies on OD are needed in Brazil to refine and validate the variables identified in the present study, improve the understanding of and approach to these conditions, and prevent damage to the health of workers.

REFERENCES

1. Brasil. Ministério da Saúde. Secretaria de Atenção à Saúde. Departamento de Ações Programáticas Estratégicas. Dermatoses ocupacionais. Brasília: Editora do Ministério da Saúde; 2006. 92 p. (Série A. Normas e Manuais Técnicos) (Saúde do Trabalhador; 9).
2. Alchorne AOA, Alchorne, MMA, Silva MM. Dermatoses Ocupacionais. *An Bras Dermatol*. 2010;85(2):137-47. <http://dx.doi.org/10.1590/S0365-05962010000200003>
3. Ali SA. Dermatoses ocupacionais. 2nd ed. São Paulo: Fundacentro; 2009.
4. Motta AA, Aun MV, Kalil J, Giavina-Bianchini P. Dermatite de contato. *Rev Bras Alerg Immunopatol*. 2011;34(3):73-82. <http://dx.doi.org/0103-2259/11/34-03/73>
5. Duarte I, Rotter A, Lazzarini R. Frequência da dermatite de contato ocupacional em ambulatório de alergia dermatológica. *An Bras Dermatol*. 2010;85(4):455-9. <http://dx.doi.org/10.1590/S0365-05962010000400006>
6. Mello TA, Barbosa-Branco A. Prevalência de benefícios auxílio-doença entre trabalhadores da construção no Brasil em 2009. *Rev Bras Saúde Ocup*. 2014;39(130):224-38. <http://dx.doi.org/10.1590/0303-7657000084913>
7. Lazzarini R, Duarte IAG, Sumita JM, Minnicelli R. Dermatite de contato alérgica entre pedreiros, num serviço não especializado em dermatoses ocupacionais. *Anais Bras Dermatol*. 2012;87(4):576-1.
8. Hearst N, Grady D, Barron H, Kerlikowske. Pesquisas com dados existentes: análise de dados secundários, estudos suplementares e revisões sistemáticas. Delineando a pesquisa clínica: uma abordagem epidemiológica. Porto Alegre: Artmed; 2008.
9. Mirabelli MC, Vizcaya D, Martí-Margarit A, Antó JM, Arjona L, Barreiro E, et al. Occupational risk factors for hand dermatitis among professional cleaners in Spain. *Contact Dermatitis*. 2012;66(4):88-196. <https://dx.doi.org/10.1111%2Fj.1600-0536.2011.02023.x>
10. Smedley J, Williams S, Peel P, Pedersen K. Management of occupational dermatitis in healthcare workers: a systematic review. *Occup Environ Med*. 2012;69(4):276-9. <https://doi.org/10.1136/oemed-2011-100315>
11. Lima CMF, Hernandez GH, Navajas S, Swarowsky G, Kalil J, Galvão CES. Doença alérgica ocupacional: aspectos socioepidemiológicos em ambulatório especializado na cidade de São Paulo. *Rev Bras Med Trab*. 2017;15(4):297-302. <https://doi.org/10.5327/Z1679443520170095>
12. Bepko J, Mansalis K. Common Occupational Disorders: Asthma, COPD, Dermatitis, and Musculoskeletal Disorders. *Am Fam Physician*. 2016;93(12):1000-6.
13. Song HS, Ryou HC. Compensation for Occupational Skin Diseases. *J Korean Med Sci*. 2014;29(Suppl.):S52-8. <https://doi.org/10.3346/jkms.2014.29.S.S52>
14. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Departamento de Vigilância Epidemiológica. Sistema de Informação de Agravos de Notificação - SINAN: normas e rotinas. 2nd ed. Brasília: Editora do Ministério da Saúde; 2007.
15. Brasil. Portaria de Consolidação nº 5, de 28 de setembro de 2017. Consolidação das normas sobre as ações e os serviços de saúde do Sistema Único de Saúde. *Diário Oficial da República Federativa do Brasil* [Internet]. 2017 [cited 7 Nov 2018]. Available at: http://bvsms.saude.gov.br/bvs/saudelegis/gm/2017/prc0005_03_10_2017.html
16. Programa das Nações Unidas para o Desenvolvimento, Instituto de Pesquisa Econômica Aplicada, Fundação João Pinheiro. Desenvolvimento humano nas macrorregiões brasileiras: 2016 [Internet]. Brasília: Programa das Nações Unidas para o Desenvolvimento/Instituto de Pesquisa Econômica Aplicada/Fundação João Pinheiro; 2016 [cited 7 Nov 2018]. Available at: http://www.ipea.gov.br/portal/images/stories/PDFs/livros/livros/20160331_livro-idhm.pdf
17. Rothman KJ. *Epidemiology: an Introduction*. 2nd ed. New York: Oxford; 2012.
18. Fletcher RH, Fletcher SW. *Epidemiologia clínica. Elementos essenciais*. 4th ed. Translated by Roberta Marchiori Martins. Porto Alegre: Artmed; 2006. 288 p.
19. Geier J, Krauthelm A, Uter W, Lessmann H, Schnuch A. Occupational contact allergy in the building trade in Germany: influence of preventive measures and changing exposure. *Int Arch Occup Environ Health*. 2011;84(4):403-11. <https://doi.org/10.1007/s00420-010-0581-8>
20. Instituto Brasileiro de Geografia e Estatística. Censo Populacional 2010 [Internet]. Rio de Janeiro: Instituto Brasileiro de Geografia e Estatística; 2010 [cited 20 Mar 2018]. Available at: <http://censo2010.ibge.gov.br>
21. Plombom GY, Oliveira MS, Tabushi FL, Kassem AJ, Purim KSM, Nishihara RM. Análise epidemiológica das dermatoses ocupacionais notificadas no Brasil no período de 2007 a 2012. *An Bras Dermatol*. 2016;91(6):732-6.
22. Scherrer MAR, Rocha VB, Andrade ARC. Dermatite de contato por metilisotiazolinona. *An Bras Dermatol*. 2015;90(6):910-2.
23. Weisshaar E, Skudlik C, Scheidt R, Mattern U, Wulfhorst B, Schönfeld M, et al. Multicentre study 'rehabilitation of occupational skin diseases - optimization and quality assurance of inpatient management (ROQ)' - results from 12-month follow-up. *Contact Dermatitis*. 2013;68(3):169-74. <https://doi.org/10.1111/j.1600-0536.2012.02170.x>
24. Skudlik C, Weisshaar E, Scheidt R, Wulfhorst B, Diepgen TL, Elsner P, et al. Multicenter study "Medical-Occupational Rehabilitation Procedure Skin - optimizing and quality assurance of inpatient-management (ROQ)". *J Dtsch Dermatol Ges*. 2009;7(2):122-6.

25. Kwork C, Money A, Carder M, Turner S, Agius R, Orton D, et al. Cases of occupational dermatitis and asthma in beauticians that were reported to The Health and Occupation Research (THOR) network from 1996 to 2011. *Clin Exp Dermatol*. 2014;39(5):590-5. <https://doi.org/10.1111/ced.12367>
26. Mose AP, Lundov MD, Zachariae C, Menné T, Veien NK, Laurberg G, et al. Occupational contact dermatitis in painters - an analysis of patch test data from the Danish Contact Dermatitis Group. *Contact Dermatitis*. 2012;67(5):293-7. <https://doi.org/10.1111/j.1600-0536.2012.02074.x>
27. Duarte I, Amorim JR, Perázio EF, Schmitz Junior R. Dermatite de contato por metais: prevalência de sensibilização ao níquel, cobalto e cromo. *An Bras Dermatol*. 2005;80(2):137-42. <http://dx.doi.org/10.1590/S0365-05962005000200003>
28. Brasil. Norma Regulamentadora 6. Equipamento de Proteção Individual [Internet]. Brasília: Ministério do Trabalho e Emprego; 2010 [cited 30 Jun 2014]. Available at: [http://portal.mte.gov.br/data/files/FF8080812DC56F8F012DCDAD35721F50/NR06%20\(atualizada\)%202010.pdf](http://portal.mte.gov.br/data/files/FF8080812DC56F8F012DCDAD35721F50/NR06%20(atualizada)%202010.pdf)

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