

Suggestive complaints of irritant dermatitis in a community of artisanal fishermen and fisherwomen: prevalence and associated factors

Queixas sugestivas de dermatite irritante em uma comunidade de pescadores e pescadoras artesanais: prevalência e fatores associados

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Abstract

Introduction: the skin complaints presented by artisanal fishermen and artisanal fisherwomen of Santiago do Iguape community are compromising fishing, income, and subsistence of families. **Objective:** to identify the prevalence and factors associated with complaints suggestive of irritant dermatitis in artisanal fishermen and artisanal fisherwomen. **Methods:** it is a cross-sectional study carried out with 248 artisanal fishing workers from the community of Santiago do Iguape, Cachoeira, Bahia, Brazil. The research instrument was elaborated, containing questions about the sociodemographic characteristics and artisanal fishing work, labour history, domestic activities, clinical history, preventive measures and/or contact products, dermatological complaints and skin complaints related to the contact agent and exposure. Logistic regression analysis was performed to identify factors associated with complaints suggestive of irritant dermatitis. **Results:** the prevalence of complaints suggestive of irritant dermatitis was 25%. The factors that presented positive and significant associations with complaints suggestive of irritant dermatitis were the daily workload with fishing greater than ten hours, the use of gloves at work, clinical history of allergic rhinitis, age ≤ 30 years, and marital status married/dating/live together. **Conclusion:** the research findings indicate the need to develop prevention and control strategies in the Basic Health Units of the fishing communities, seeking to contribute to improving the health and work of these professionals.

Keywords: Dermatitis irritant; dermatitis contact; workers; skin

Resumo

Introdução: as queixas de pele apresentadas por pescadores e pescadoras artesanais da comunidade Santiago do Iguape vêm comprometendo a pesca, a renda e a subsistência das famílias. **Objetivo:** identificar a prevalência e os fatores associados às queixas sugestivas de dermatite irritante em pescadores e pescadoras artesanais. **Metodologia:** trata-se de um estudo de corte transversal realizado com 248 trabalhadores (as) da pesca artesanal da comunidade Santiago do Iguape, Cachoeira, Bahia, Brasil. O instrumento de pesquisa foi elaborado contendo questões sobre as características sociodemográficas e do trabalho da pesca artesanal, histórico laboral, atividades domésticas, história clínica, medidas preventivas e/ou produtos de contato, queixas dermatológicas e queixas de pele relacionadas à agente de contato e de exposição. A análise de regressão logística foi utilizada para identificar os fatores associados às queixas sugestivas de dermatite irritante. **Resultados:** a prevalência de queixas sugestivas de dermatite irritante foi de 25%. Os fatores que apresentaram associações positivas e significativas com as queixas sugestivas de dermatite irritante foram a carga horária diária de trabalho com a pesca maior que dez horas, o uso de luvas no trabalho, história clínica de rinite alérgica, idade ≤ 30 anos e estado civil casado(a)/amigado(a)/mora junto. **Conclusão:** os achados da pesquisa denotam a necessidade de desenvolver estratégias de prevenção e controle nas Unidades Básicas de Saúde das comunidades pesqueiras, buscando contribuir para melhoria da saúde e do trabalho desses profissionais.

Palavras-chave: Dermatite irritante; dermatite de contato; trabalhadores; pele.

INTRODUCTION

Irritant contact dermatitis (ICD)¹ represents about 80% of cases of contact dermatitis in the general popu-

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lation, being considered a non-immunological skin reaction; that is, there is no need for prior sensitization². Skin irritation can occur when the worker has contact with a chemical agent, suffers a minor trauma, or constantly carries out their activities in a humid environment³. Oceans cover 70 per cent of the Earth's surface, providing food and livelihoods for 3 billion people, and contain numerous creatures able to cause harm to humans, not to mention pollution, especially when encounters with humans are constant⁴.

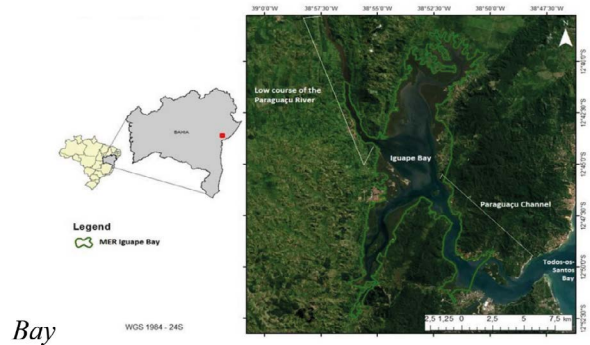
Artisanal fishermen, which include fishermen and shellfish gatherers, have frequent contact with humid environments in their activity, being in the high seas, inner seas, and intertidal regions, and in some cases, also exposed to pollution resulting from the lack of basic sanitation and poor industrial waste treatment⁵. In relation to ICD and other neglected diseases, Maierovitch (pers. comm.) states that "in addition to the general issues affecting the Brazilian population as a whole, there are diseases that are both a consequence of poverty, particularly extreme poverty and perpetuate misery.", insofar as they worsen social exclusion and decrease the insertion of people in the labour market.

Some epidemiological studies have looked at skin diseases in fishermen^{6,7}. Since 2007, the artisanal fisherman of Santiago do Iguape, a locality in the Iguape Bay (Cachoeira, BA, Brazil), have presented skin complaints after having contact with estuarine water or mud from the nearby mangrove. The class has been suffering so much from this rash that in their working group, this was described as the major problem they have been facing, as they were incapable of providing for their families someday, thus reducing, even more, their low income and their family protein source. The population asked us to carry out an exploratory epidemiological survey to identify the type of dermatitis, its prevalence in the people, and the factors associated with its presence. After a brief study by a dermatologist, she concluded by the reported complaints and by checking the characteristics of the lesion in patients, which was ICD. Considering this information, we started an epidemiological study to measure the prevalence of ICD in the population and the factors associated with this pathology.

METHODOLOGY

A cross-sectional epidemiology study was carried out in the Iguape Bay Marine Extractive Reserve of Baía do Iguape Bay (RESEX) (Figure 1) with fishermen and the artisanal fishermen community, developed in the context of community-based participatory research. The RESEX covers an area of 8,117.53 hectares in the estuary of the Paraguaçu River, with 2,831.24 hectares of mangroves and 5,286.29 of estuarine waters⁸. In Santiago do Iguape village, around 2,500 people live, and fishing is the primary source of subsistence⁹.

Figure 1 – Location map of the Iguape Bay Marine Extractive Reserve of Baía do Iguape Bay



Fonte: Veloso Junior¹⁰ (2020).

The questionnaire was based on the Nordic Occupational Skin Questionnaire (NOSQ)¹¹ (2002), complemented with other items previously developed by the same team Moura¹² (2013), in addition to the Occupational Dermatoses Investigation Form of the Occupational Diseases Information System¹³, and the inclusion of the definition of the Brazilian Society of Dermatology for contact dermatitis¹⁴.

To conduct the survey, including adapting the instrument to the research questions and the local language, a collaborative group formed by university researchers, artisanal fishermen, and healthcare professionals participated in all stages of the process. The adapted questionnaire was then sent to three dermatologists for content validation¹⁵. Dermatologists verified the instrument's clarity through semantic analysis, which involved investigating whether the questions and alternatives for answers were intelligible to the subjects who participated in the research and if the formulated questions would adequately estimate the studied subject¹⁶.

The questionnaire contains variables related to socio-demographic and artisanal fishing working features and history, domestic activities, clinical history, preventive measures and contact products, and dermatological and skin complaints related to the contact and exposure agent. ICD cases were self-reported and defined by the artisanal fishermen, who reported redness, pain, rough skin, skin dryness, and burning after contact with objects and or substances present in their working place or necessary to carry out their activity.

The research was approved by the Research Ethics Committee of the Faculty of Medicine of the Federal University of Bahia (CAAE n. 12024913.9.0000.5577) and followed the ethical procedures from the Resolution n 466/2012 of the National Health Council of the Brazilian Ministry of Health¹⁷. Data was collected between April and June 2017.

Population and Area

The sampling technique used was randomly stratified by sex, and a draw was carried out based on the total

number of fishermen and artisanal fishermen living in Santiago do Iguape, which the RESEX registered (Extractive Reserve). The sample size was calculated to estimate the proportion of ICD in the population, considering a finite population: prevalence of 50%, error of 5% and confidence of 95%, a total population (N) of 537 artisanal fishermen. Considering 10% for losses, the final sample was 248, with 169 women (68,1%) and 79 men (31,9%).

Sampling and Inclusion Criteria

Only the artisanal fishermen and women aged ≥ 18 years, residents of Santiago do Iguape, who were engaged in fishing activity during the survey period, agreed to participate, and signed the informed consent form were included. Chosen individuals who were away from work due to any skin rash were included to reduce the occurrence of bias of the healthy worker effect¹⁸.

Individuals not exercising their working activities during the data collection period due to diseases other than skin ones were excluded from the research. In the case of two workers living in the same residence were selected, only the first one selected participated in the interview and was replaced by the next one on the list.

Statistical Analysis

A data form was created using EpiData (available in *epidata.dk*), version 3.1. The data were analysed statistically using R (available at *cran.R-project.org*), version 3.3.1. The quantitative and qualitative variables had more than two categories and were dichotomised.

Subsequently, the ICD prevalence was calculated with the type of complaint self-reported skin beyond the prevalence ratios (PR) and adjusted for ICD and their confidence intervals (CI) at a 95% level. The adjusted PR

and respective 95% CI were obtained using the logistic regression model and the delta methods¹⁹.

Initially, a univariate logistic regression model was performed, in which independent variables with a *p*-value of 0.25 were considered significant to enter the multiple regression²⁰.

To adjust the multiple logistic regression model, the variables' entry was considered using the backward method²¹. To observe their significance, the Wald test and the likelihood ratio test were adopted at the level of 5%. In possession of the preliminary model, tests for interaction were also considered, and it was observed whether there was confusion between the variables. The normal probability plot with a simulated envelope was constructed²¹ to identify whether the model was well adjusted.

RESULTS

Of the 248 respondents, 170 (68.55%) were female, and the mean age was 38.81 years, with a standard deviation of 11.28 years, and 182 (73.39%) were aged > 30 years. A large majority, 187 (75.40%), have declared themselves as black, 142 (57.26%) completed elementary school, 145 (58.47%) were married or lived together with their partners, and 211 (85.08%) had children aged ≥ 4 years of age or had no children. Among fishermen, 190 (76.61%) worked up to 10 hours a day fishing, and 76 (30.65%) had another occupation. The average weekly income from fishing was R\$ 68.89 (US\$21,73), with a standard deviation of R\$ 46.38 (US\$13,67), which makes an average of R\$275.56/month (US\$87,87/month), about US\$2,9/day, in average (Table 1) in the last version calculates the income in US\$.

Table 1 – Sociodemographic, labour, and extra-labour characteristics and clinical history of artisanal fishermen and artisanal fisherwomen from Santiago do Iguape, Cachoeira, Bahia, Brazil, 2017 (n = 248)

Variables		Average	SD
Age (Years)		38.81	11.28
Weekly income earned from artisanal fishing (BRL – R\$)		68.89	46.38
Daily fishing workload (hours)		8.87	2.33
Variables		n	%
Age (years)	≤ 30	66	26.61
	> 30	182	73.39
Breed	African descent	187	75.40
	Non African descent	61	24.60
Education level	\leq Elementary and Middle School, including those who have not studied	142	57.26
	$>$ Complete Middle School	106	42.74
Marital status	Married /Dating / Cohabiting	145	58.47
	Single / Divorced / Widowed	103	41.53
Children's age (years)	< 4	37	14.92
	≥ 4 or do not have children	211	85.08
Gender	Female	170	68.55
	Male	78	31.45
Weekly income (BRL)	\leq R\$ 90	187	75.40

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	> R\$ 90	61	24.60
Other current jobs	Yes	76	30.65
	No	172	69.35
Other previous work	Yes	80	32.26
	No	168	67.74
Daily fishing workload (hours)	≤ 10	190	76.61
	> 10	58	23.39
Number of weekly days of work with fishing (days)	≤ 5	156	62.90
	> 5	92	37.10
Time spent on housework in the week (hours)	≤ 21	188	75.81
	> 21	60	24.19
Self-reported clinical history			
Injuries that do not heal	Yes	8	3.23
	No	240	96.77
Allergic rhinitis	Yes	95	38.31
	No	153	61.69
Asthma	Yes	20	8.06
	No	228	91.94
Allergies diagnosis	Yes	39	15.73
	No	209	84.27

Source: research data

Regarding the use of skin products to offer skin protection against insect bites during work hours, 219 (88.31%) reported using kerosene, kerosene with olive oil and garlic on the skin, 152 (61.29%) diesel oil, and 32 (12.90%) cooking oil. As for the preventive measures used at work, more than 50% of respondents reported wearing closed shoes, long pants, a kerchief, a long-sleeved shirt, and a cap (Table 2).

Table 2 – Preventive measures and/or contact products used by artisanal fishermen and artisanal fisherwomen from Santiago do Iguape, Cachoeira, Bahia, Brazil, 2017 (n = 248)

Preventive measures and / or contact products	n	%	
Kerosene / kerosene with olive oil and garlic	Yes	219	88.31
	No	29	11.69
Closed shoes	Yes	156	62.90
	No	92	37.10
Trousers	Yes	153	61.69
	No	95	38.31
Diesel oil	Yes	152	61.29
	No	96	38.71
Cloth tied on the head	Yes	143	57.66
	No	105	42.34
Long sleeve shirt	Yes	137	55.24
	No	111	44.76
Cap	Yes	137	55.24
	No	111	44.76
Hat	Yes	55	22.18
	No	193	77.82
Gloves	Yes	50	20.16
	No	198	79.84
Moisturizer/cream	Yes	38	15.32
	No	210	84.68
Kitchen oil	Yes	32	12.90
	No	216	87.10
Sunblock	Yes	21	8.47
	No	227	91.53
Suntan oil	Yes	7	2.82
	No	241	97.18

Source: research data

The ICD prevalence was 25% (62 cases), considering the case definition adopted in this study. The complaints that made up the case definition are among the most prevalent in this study, with the prevalence values being 78.63% (195) for skin dryness, 75.40% (187) for burning, 68.95% (171) for rough skin, 63.71% (158) for redness and 37.90% (94) for pain (data not shown in table).

The results of the gross PR and respective 95% CI of ICD in the interviewees showed positive and significant associations between the independent variables, daily workload with fishing > 10 hours, use of gloves, clinical history of allergic rhinitis and asthma, and the dependent variable, ICD (Table 3).

Table 3 – Gross prevalence ratios (PR) and respective 95% confidence intervals (CI) of complaints suggestive of irritant contact dermatitis in artisanal fishermen and artisanal fisherwomen from Santiago do Iguape, Cachoeira, Bahia, Brazil, 2017 (n = 248)

Variables	n	%	Gross PR	CI 95%
Age (years)	> 30	182	21.98	1
	≤ 30*	66	33.33	1.52 [0.98; 2.35]
Breed	African descent	187	25.67	1
	Non-African descent *	61	22.95	0.89 [0.53; 1.50]
Education level	> Complete Middle School	106	30.19	1
	≤ Elementary and Middle School, including those who have not studied*	142	21.13	0.70 [0.46; 1.08]
Marital status	Single / Divorced / Widowed	103	20.39	1
	Married / Dating / Cohabiting *	145	28.28	1.39 [0.87; 2.20]
Children's age (years)	≥ 4 or do not have children	211	23.22	1
	< 4 *	37	35.14	1.51 [0.92; 2.50]
Gender	Male	78	26.92	1
	Female *	170	24.12	0.90 [0.57; 1.41]
Weekly income (BRL)	> R\$ 90	61	31.15	1
	≤ R\$ 90*	187	22.99	0.74 [0.47; 1.16]
Other current jobs	No	172	26.16	1
	Yes*	76	22.37	0.85 [0.52; 1.39]
Other previous work	No	168	27.38	1
	Yes*	80	20	0.73 [0.44; 1.21]
Daily fishing workload (hours)	≤ 10	190	21.05	1
	> 10*	58	37.93	1.80 [1.17; 2.77]
Number of weekly days of work with fishing (days)	≤ 5	156	21.15	1
	> 5*	92	31.52	1.49 [0.97; 2.28]
Preventive measures and / or contact products				
Long sleeve shirt	No	111	19.82	1
	Yes*	137	29.20	1.47 [0.93; 2.32]
Cap	No	111	19.82	1
	Yes*	137	29.20	1.47 [0.93; 2.32]
Closed shoes	No	92	26.09	1
	Yes*	156	24.36	0.93 [0.60; 1.45]
Moisturizer/cream	No	210	25.71	1
	Yes*	38	21.05	0.82 [0.42; 1.58]
Kitchen oil	No	216	25	1
	Yes*	32	25	1 [0.53; 1.90]
Cloth tied on the head	No	105	25.71	1
	Yes*	143	24.48	0.95 [0.62; 1.47]
Trousers	No	95	21.05	1
	Yes*	153	27.45	1.30 [0.82; 2.08]
Sunblock	No	227	24.23	1
	Yes*	21	33.33	1.38 [0.72; 2.63]
Hat	No	193	23.32	1
	Yes*	55	30.91	1.33 [0.83; 2.12]
Gloves	No	198	22.22	1
	Yes*	50	36	1.62 [1.03; 2.55]
Diesel oil	No	96	23.96	1
	Yes*	152	25.66	1.07 [0.68; 1.68]

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Suntan oil	No	241	25.31	1	[0.09; 3.51]
	Yes*	7	14.29	0.56	
Kerosene / kerosene with olive oil and garlic	No	29	27.59	1	[0.47; 1.68]
	Yes*	219	24.66	0.89	
Time spent on housework in the week (hours)	≤ 21	188	27.13	1	[0.38; 1.21]
	> 21*	60	18.33	0.68	
Self-reported clinical history					
Injuries that do not heal	No	240	24.58	1	[0.61; 3.83]
	Yes*	8	37.50	1.53	
Allergic rhinitis	No	153	19.61	1	[1.12; 2.63]
	Yes*	95	33.68	1.72	
Asthma	No	228	23.25	1	[1.13; 3.32]
	Yes*	20	45	1.94	
Allergies diagnosis	No	209	22.97	1	[0.96; 2.54]
	Yes*	39	35.90	1.56	

*Exposed

Source: research data

Table 4 shows respondents' adjusted PR and respective 95% CI for ICD. The values indicate that an ICD prevalence in individuals aged ≤30 years was 88% higher than the prevalence in those aged >30 years. Workers who

were married/friendly or who lived together with their companions had an ICD prevalence of 79% higher than those single, separated, or widowed.

Table 4 – Adjusted prevalence ratios (PR) and respective 95% confidence intervals (CI) for complaints suggestive of irritant contact dermatitis in artisanal fishermen and artisanal fisherwomen from Santiago do Iguape, Cachoeira, Bahia, Brazil, 2017 (n = 248)

Variables		Adjusted PR	CI 95%
Age (years)	> 30	1	[1.17; 3.04]
	≤ 30*	1.88	
Marital status	Single / Divorced / Widowed	1	[1.05; 3.04]
	Married / Dating / Cohabiting *	1.79	
Daily fishing workload (hours)	≤ 10	1	[1.33; 3.40]
	> 10*	2.13	
Preventive measures and / or contact products			
Gloves	No	1	[1.18; 3.16]
	Yes*	1.93	
Self-reported clinical history			
Allergic rhinitis	No	1	[1.18; 3.03]
	Yes*	1.89	

*Exposed

Source: research data

The ICD prevalence among individuals who worked more than ten hours a day was 2.13 times the prevalence in individuals who worked less than ten hours daily. Respondents who wore gloves at work had a 93% higher ICD prevalence than those who did not wear them. The ICD prevalence among artisanal fishermen who reported having had allergic rhinitis was 1.89 times the prevalence of those who reported not having had the disease (Table 4).

It is noteworthy to say that the normal probability plot with a simulated envelope generated by the adjusted logistic model did not show observations outside the confidence interval, thus indicating a good model adjustment.

DISCUSSION

The ICD prevalence found in this study was 25% (62), considering the case definition adopted. The skin complaints ratified in the case definition are among the clinical manifestations of irritating dermatitis specified by the Brazilian Society of Dermatology¹³ and among the most prevalent skin complaints by the interviewees.

A recent study²² developed in the Paraguaçu River estuary identified the first record of *Amorphinopsis Atlantica* (Porifera: Demospongiae: Halicondriidae). Local fishermen claim that the sponge has been causing skin dermatitis since 2006, owing to its characteristics such as high spicular density and pointed spicules and its wide distribution in Iguape Bay.

The absence of a guideline for the definition of a case of contact dermatitis, be it occupational or irritating, with a consequent complication in achieving reliable results in epidemiological research, is an object of discussion^{23,24}. Lushniak²⁵ (1997) adds that this definition is diverse in each study, as the events can be identified as “dermatitis, contact dermatitis, eczema or occupational dermatitis”, and often no differentiation is made between irritant and allergic contact dermatitis.

In the present study, the adjusted logistic model showed a positive and significant association between the independent variables, age ≤ 30 years, marital status married, living together, daily workload with fishing > 10 hours, use of gloves, clinical history of allergic rhinitis, and the dependent variable of the research, IDC. The association does not mean correlation; some variables have nothing to do with the association. Although the variable clinical history of asthma was significant in the bivariate analysis, it did not remain in the adjusted logistic model.

In view of the arguments presented, skin complaints are a pathological condition that must be studied and discussed in the field of artisanal fishermen’s health to support the development of health intervention strategies and actions.

The limitations inherent to this research’s study design do not allow us to establish a cause-and-effect relationship²⁶. However, the occurrence of the healthy worker effect bias was minimised since the pathology studied is hardly fatal²⁷ and workers on leave due to skin-related problems were easily found in the community.

CONCLUSION

The fishermen IDC prevalence of 25% in the Santiago do Iguape village and the prevalence of skin complaints that comprised the definition of the adopted case demonstrates that strategies for prevention and control need to be developed and implemented in the basic unit of community health, which is where the workers have the nearest health services, and extended to other fishing communities nearby, in order to improve fishermen’s health condition, that is similar in other communities.

This research, which was a demand of the community, allowed the construction of an instrument for ICD investigation, which can be used for other epidemiological studies that address this theme in other fishing communities. The identification of both the prevalence of ICD and the associated factors allows the health sector to implement preventive measures that consider individual susceptibility (clinical history of allergic rhinitis), work exposures (daily workload > 10 hours and use of gloves) and sociodemographic characteristics (age ≤ 30 years and marital status married or living together). However, prospective studies need to be carried out to identify environmental factors that may be associated with this high prevalence of skin complaints, in addition to evaluation with dermatologists for diagnostic investigation and prescription of drug therapy.

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