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Implications of health conditions on rural soybean workers' quality of life

Implicações das condições de saúde na qualidade de vida de trabalhadores rurais da soja

Implicaciones de las condiciones de salud en la calidad de vida de los trabajadores rurales de la soja

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ABSTRACT

Objective: to analyze the implications of health conditions on rural workers' quality of life in the context of soybean production. **Method:** a cross-sectional study, with an intentional sample of 299 male rural workers. Data collection took place between October and December 2019. The following instruments were used: World Health Organization Quality Life-bref; Rural Workers' Living & Health Conditions questionnaire; International Physical Activity Questionnaire; Cut down, Annoyed, Guilty, and Eye-opener. They were analyzed via descriptive and inferential statistics, using bivariate (Mann-Whitney; Kruskal-Wallis) and multivariate tests (generalized additive models for location, scale and shape). **Results:** the presence of a diagnosis of morbidity, alcohol dependence, occupational accidents and absenteeism implied a decrease in workers' quality of life scores. **Conclusion:** the existence of unfavorable health conditions has a negative impact on rural soybean workers' quality of life.
Descriptors: Quality of Life; Men's Health; Occupational Health; Rural Workers; Occupational Health Nursing.

RESUMO

Objetivo: analisar as implicações das condições de saúde na qualidade de vida dos trabalhadores rurais inseridos no contexto de produção da soja. **Método:** pesquisa transversal a partir de uma amostra por conveniência de 299 homens trabalhadores rurais. A coleta ocorreu entre os meses de outubro e dezembro de 2019. Utilizaram-se os instrumentos: *World Health Organization Quality Life-bref*; questionário Condições de Vida & Saúde dos Trabalhadores Rurais; *International Physical Activity Questionnaire*; *Cut down, Annoyed, Guilty, and Eye-opener*. Foram analisados via estatística descritiva e inferencial, com aplicação de testes bivariados (Mann-Whitney; Kruskal-Wallis) e multivariados (modelos aditivos generalizados para locação, escala e forma). **Resultados:** a presença de diagnóstico de morbidade, dependência de álcool, acidente no trabalho e absenteísmo implicaram diminuição dos escores de qualidade de vida dos trabalhadores estudados. **Conclusão:** a existência de condições de saúde desfavorável repercute negativamente na qualidade de vida dos trabalhadores rurais atuantes no contexto da soja.
Descritores: Qualidade de Vida; Saúde do Homem; Saúde do Trabalhador; Trabalhadores Rurais; Enfermagem do Trabalho.

RESUMEN

Objetivo: analizar las implicaciones de las condiciones de salud en la calidad de vida de los trabajadores rurales en el contexto de la producción de soja. **Método:** estudio transversal, con una muestra intencional de 299 trabajadores rurales del sexo masculino. La recolección de datos ocurrió entre octubre y diciembre de 2019. Se utilizaron los siguientes instrumentos: World Health Organization Quality Life-bref; Cuestionario de Condiciones de Vida y Salud de los Trabajadores Rurales; International Physical Activity Questionnaire; Cut down, Annoyed, Guilty, and Eye-opener. Se analizaron mediante estadística descriptiva e inferencial, utilizando pruebas bivariadas (Mann-Whitney; Kruskal-Wallis) y multivariadas (modelos aditivos generalizados de ubicación, escala y forma). **Resultados:** la presencia de diagnóstico de morbilidad, dependencia del alcohol, accidentes de trabajo y ausentismo implicó una disminución en los puntajes de calidad de vida de los trabajadores estudiados. **Conclusión:** la existencia de condiciones de salud desfavorables impacta negativamente en la calidad de vida de los trabajadores rurales que trabajan en el contexto de la soja.
Descriptores: Calidad de Vida; Salud del Hombre; Salud Laboral; Trabajadores Rurales; Enfermería del Trabajo.

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INTRODUCTION

Quality of life (QoL) is a concern of contemporary society, and has presented itself as an object of research of growing interest[1]. The World Health Organization (WHO)[2] characterizes QoL as "individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns". Thus, it is perceived that QoL is a multifaceted concept, in which the different dimensions related to an individual's life context need to be considered.

In this sense, QoL becomes an important measure of a population's health conditions, and can help in the definition of priorities and strategies for health promotion and disease prevention. Therefore, health conditions play an important role in the conformation of QoL, and can be evidenced through information on health status, which may reflect the health situation of a population, besides contributing to health surveillance[3].

Another relevant aspect in QoL composition is work, which exposes individuals to certain risks and vulnerabilities, to a greater or lesser extent, according to the sector of activity, and which has a direct consequence in health conditions[4].

Specifically in the agribusiness sector, an economic activity of great importance for the country, which brings together a significant contingent of rural workers, it was found that, even during the current economic crisis caused by the COVID-19 pandemic, the sector maintained the operation and growth of its activities, mainly in grain production, which showed an increase of 4.8% in the 2019/20 crop[5]. Despite this importance, little has been produced in the scientific literature on the health profile and QoL of workers in this sector.

A study that sought to analyze publications on the QoL of rural workers found that there is still little evidence related to this topic. These authors found only studies that related QoL with musculoskeletal disorders and mental health[6]. It was also observed the absence of studies that related the use of pesticides to rural workers' QoL[6].

On the other hand, studies point to important implications associated with rural workers' health conditions, such as musculoskeletal and postural diseases, arthritis, rheumatism, hypertension[7], occupational accidents arising from ergonomic, biological, physical, chemical, psychosocial risks, agricultural implement handling and excessive workloads[8], as well as poisoning caused by pesticide handling[9].

In this context, there was a lack of research aimed at tracing the health conditions of rural workers and their implications for QoL, in order to enable the recognition of the challenges to be overcome, with a view to promoting the improvement of comprehensive health care of these workers.

OBJECTIVE

To analyze the implications of health conditions on the QoL of male rural workers working in soybean production.

METHODS

Ethical aspects

This study was approved by the Research Ethics Committee (CEP), Campus Sinop (CEP-Sinop), and was conducted following ethical standards in research in line with the requirements required by Resolution No. 466/2012 that regulates research with human beings. of the National Health Council.

Study design, period, and location

This is a cross-sectional analytical study, based on the STrengthening the Reporting of OBservational studies in Epidemiology (STROBE). Data collection was carried out during the planting of the 2019/2020 crop, which took place between October 2019 and December 2019, in rural establishments (soybean farms and warehouses) located in the rural area of the municipality of Sinop, Mato Grosso.

Study sample; inclusion and exclusion criteria

As a result of obstacles that occurred during access to soy establishments where rural workers worked, it was necessary to adopt non-probabilistic sampling according to the convenience of the researchers to access the study subjects, so data were collected in establishments that authorized entry. of the research team. Thus, the minimum sample was based on the proportion of 50%, usually used when the prevalence of the outcome is not known. resulting in a sample of 277 rural workers. To prevent possible losses, 15% was added, ending in a sample of 318 subjects. The criteria for inclusion of subjects were: being a man over 18 years old, rural worker in the soybean field. Subjects on vacation or sick leave, as well as those who were in the field during data collection, were not included. Subjects who did not respond to all questionnaires and/or did not collect anthropometric information were classified as losses.

Study protocol

For data collection, individual workplace interviews were conducted using the following instruments: World Health Organization Quality Life-bref (WHOQOL-bref) developed by WHO[10], with two questions that assess the general QoL and 24 questions related to the physical, psychological, social relations and environment domains. The WHOQOL-bref was validated in Brazil by Fleck et al. (2000)[11], with a population of 300 individuals in the city of Porto Alegre, presenting reliability of 0.84 for the physical domain, 0.79, for the psychological domain, 0.69, for the social relations domain, and 0.71, for the environment domain. The application of the WHOQOL-bref in rural workers of this study presented high reliability with Cronbach's Alpha (0.85). Dependent variables were composed of information obtained by the WHOQOL-bref scale and analyzed from the WHO syntax[10], with scores ranging from 0 to 100, and the higher the score, the better the QoL. Information on health conditions was obtained through the following instruments: Living Conditions & Health of Rural Workers (CVSTR) questionnaire[12]; International Physical Activity Questionnaire (IPAQ)[13], in the reduced format for the evaluation of the practice of physical activity; CAGE, acronym for Cut down, Annoyed by criticism, Guilty and Eye-opener[14], to check for alcohol dependence. At the end of the interview, anthropometric data were collected, thus composing the study independent variables.

Analysis of results, and statistics

In this study, the level of physical activity was classified as inactive, insufficiently active, active and very active[13]. For regression analysis, it was categorized into active and inactive. Weight and height were measured following the recommendations of the Brazilian Association for the Study of Obesity and Metabolic Syndrome (ABESO - *Associação Brasileira para o Estudo da Obesidade e Síndrome Metabólica*)[15]. Body Mass Index (BMI) was obtained from the formula: BMI= weight (Kg)/ height (m), classified according to the cut-off points proposed by ABESO. Cardiovascular risk was verified by measuring waist circumference (WC) in centimeters, with a flexible/inextensible tape and classified according to the VII Brazilian Guideline on Hypertension (*Diretriz Brasileira de Hipertensão Arterial*), chapter IV, which deals with cardiovascular risk stratification[16].

Blood pressure (BP) measurement was performed based on the auscultatory method in a single measure. The classification of BP levels and the measurement methodology followed the recommendations of the VII Brazilian Guidelines on Hypertension, chapter II, which deals with BP diagnosis and classification[17]. Participants who reported the use of hypertensive medication were classified as prehypertensive. Data were entered in a Microsoft Excel® spreadsheet, and data analysis was performed with the software Statistical Package for the Social Science (SPSS® 20) and the Software R, with the aid of GAMLSS[18].

For data analysis, relative, absolute and inferential frequencies were measured, considering QoL and its domains. To test the normality of the distributions of the variables, the Shapiro-Wilk Test was applied, which confirmed that the dependent variables did not have a normal distribution, that is, non-parametric. Thus, it was necessary to use the Mann-Whitney for and Kruskal-Wallis statistical tests with the application of Dunn's post-hoc test. In order to control possible confounding factors, variables that presented a p value greater than 0.10 in the bivariate analysis stage were included in the GLAMLSS (Generalized Additive Models for Location, Scale and Shape) model. During the analyses, 5% was considered as a significance level, that is, a p value lower than 0.05. The Akaike Information Criterion (AIC) was defined as a standard to guide the choice of the most adequate distribution for data modeling. *Listwise deletion* technique was adopted to deal with missing information.

RESULTS

A total of 315 rural workers were interviewed; of these, 16 subjects were lost, totaling a sample of 299 workers. The population was composed mostly of workers with a mean age of 34 years, single (35%), with high school (52.2%), brown (45.8%), born in Maranhão (29%) and Catholics (60%). Table 1 presents the comparation of general QoL and its domains according to the objective health data. In this, it was found that 42.5% of workers were overweight, 34.1%, cardiovascular risk and 42.1%, BP outside normal standards. There were no significant differences in the comparison of mean ranks of each domain and the general QoL in relation to the objective health data.

Table 2 presents the comparison of the general QoL and its domains according to health risk exposure. In this, it was verified that 30.8% of workers handled pesticides. Of these, 6% reported having already suffered acute intoxication and 3%, chronic intoxication; 55.5% said they suffered occupational sun exposure; 53.5% do not use sunscreen; 68.6% reported being exposed to noise; 43.1% reported being exposed to vibration; 62.9% reported being exposed to dust; 16.4% reported an occupational accident in the last year. The presence of occupational accidents showed statistical significance in the physical ($p>0.000$) and psychological ($p>0.008$) domains. Sun exposure showed statistical significance in the social relations domain ($p>0.021$). Noise exposure showed statistical significance in the physical ($p>0.002$) and environment ($p>0.032$) domains. Dust exposure showed statistical significance in the physical ($p>0.029$) and psychological ($p>0.056$) domains.

Table 3 presents the comparison of the general QoL and its domains according to absenteeism related to health and referred morbidity, in which it is observed that 27.1% reported health complaints and the need to be absent from work for health reasons in the last year, and 10% reported having a diagnosis of morbidity. Absenteeism presented statistical significance in the physical domain ($p>0.000$). Health complaints showed statistical significance in the general QoL ($p>0.019$) and in the physical ($p>0.002$) and social relations ($p>0.018$) domains. The presence of morbidity diagnosis was statistically significant in general QoL ($p>0.000$) and in the physical ($p>0.000$), psychological ($p>0.000$) and social relations ($p>0.031$) domains.

Table 4 presents the comparison of the general QoL and its domains according to behaviors and habits that influence health status. In this, it is observed that 17.5% were smokers; 14.7% were dependent on alcohol; 8.4% used medication daily; 29.8% were inactive; 60% reported seeking health care, with secondary care being the most used (42.3%). The search for health services showed statistical significance in the physical ($p>0.028$) and psychological ($p>0.028$) domains. The use of medication showed statistical significance in the general QoL ($p>0.001$) and in the physical domain ($p>0.002$). The presence of alcohol dependence was statistically significant in the physical ($p>0.031$), social ($p>0.001$) and environment ($p>0.019$) domains.

Regarding the level of physical activity, it was observed that there was a statistically significant difference in the physical domain ($p>0.001$). In Dunn's post-hoc analysis, a difference was found between the sedentary ≠ insufficiently active, sedentary ≠ active, and sedentary ≠ very active groups. There was a significant difference for the psychological domain ($p>0.032$). From Dunn's post-hoc, the presence of a difference between the sedentary ≠ insufficiently active groups was observed. Statistically significant differences were also observed in the social relationships domain ($p>0.014$), with a difference between the sedentary≠ insufficiently active groups in Dunn's post-hoc analysis.

In the regression analysis via GAMLSS, presented in Table 5, only the covariate diagnosis of morbidity (yes) remained as a predictor of general QoL, associated with a decrease in scores. Through the multivariate analysis of the coefficients estimated for the physical domain model, it was found that the covariates occupational accident (yes), absence from work for health reasons (yes) and alcohol dependence (yes) contributed to the decrease in scores of that domain. The covariate level of activity (active) contributed to the increase in scores in the physical domain, when the remaining covariates remained stable in the model.

Table 1 – Comparison of general quality of life and its domains according to the objective health data of rural workers, Mato Grosso, Brazil, 2019

Objective health data	n(%)	Physical	Psychological	Social relations	Environment	General ±QoL
				Mean ranks		
Cardiovascular risk						
Yes	102(34.1)	150.58	151.82	150.49	151.71	154.59
No	195(65.2)	145.98	143.61	146.15	143.82	138.31
p value		0.659	0.429	0.667	0.450	0.099
Body Mass Index						
Underweight	4(1.3)	114.63	136.38	147.00	156.88	155.25
Normal weight	123(41.1)	154.12	155.02	145.59	155.57	160.37
Overweight	127(42.5)	142.71	141.93	156.52	137.62	147.30
Grade I obesity	39(13.0)	155.24	158.21	134.63	160.76	123.03
Grade II obesity	4(1.3)	174.38	140.63	160.50	194.50	140.25
Grade III obesity	1(0.3)	260.00	180.00	286.00	263.00	137.50
p value		0.547	0.822	0.390	0.251	0.258
Blood pressure						
Normal	157(52.5)	141.29	141.02	143.03	140.67	143.05
Pre-hypertension	66(22.1)	139.61	140.80	137.32	140.15	144.40
Stage 1 hypertension	44(14.7)	143.68	138.06	139.48	142.50	130.38
Stage 2 hypertension	10(3.3)	118.65	151.75	129.30	126.75	112.35
Stage 3 hypertension	3(1.0)	146.17	105.33	134.00	156.17	162.33
p value		0.932	0.935	0.972	0.980	0.602

Caption: ± quality of life.

Table 2 – Comparison of general quality of life and its domains according to exposure to health risks for rural workers, Mato Grosso, Brazil, 2019

Health risk exposure	n(%)	Physical	Psychological	Social relations	Environment	General ±QoL
				Mean ranks		
Pesticide handling						
Yes	92 (30.8)	136.82	141.84	149.54	139.59	148.40
No	207(69.2)	155.86	153.63	150.20	154.63	150.71
p value		0.076	0.271	0.950	0.163	0.821
Acute intoxication						
Yes	18(6.0)	124.78	117.08	124.58	137.94	121.72
No	281(94.0)	151.62	152.11	151.63	150.77	151.81
p value		0.198	0.092	0.181	0.540	0.129
Chronic intoxication						
Yes	9 (3.0)	164.56	146.44	131.17	111.83	115.61
No	290 (97.0)	149.55	150.11	150.58	151.18	151.07
p value		0.065	0.899	0.490	0.176	0.199
Occupational accident						
Yes	49 (16.4)	103.14	120.44	142.04	130.79	134.47
No	250 (83.6)	159.18	155.79	151.56	153.77	153.04
p value		0.000*	0.008*	0.464	0.087	0.145
Sun exposure						
Yes	166(55.5)	143.02	147.48	159.94	150.20	149.58
No	133 (44.5)	158.71	153.14	137.59	149.75	150.52
p value		0.116	0.570	0.021*	0.964	0.921
Use of sunscreen						
Yes	139(46.5)	145.19	149.78	149.67	140.38	152.47
No	160 (53.5)	154.18	150.19	150.29	158.36	147.86
p value		0.366	0.968	0.948	0.071	0.626
Noise exposure						
Yes	205(68.6)	139.81	146.62	151.87	142.78	147.87
No	94(31.4)	172.21	157.38	145.91	165.75	154.64
p value		0.002*	0.312	0.565	0.032*	0.505
Vibration exposure						
Yes	129(43.1)	145.62	156.72	149.74	147.95	152.39
No	170(56.9)	153.32	144.90	150.20	151.56	148.19
p value		0.442	0.236	0.962	0.720	0.659
Dust exposure						
Yes	188(62.9)	141.70	142.73	151.31	143.97	148.03
No	111(37.1)	164.05	162.32	147.78	160.22	153.34
p value		0.029*	0.056*	0.723	0.115	0.586

*Caption: *Mann-Whitney test. with p<0.05; ± quality of life.*

Table 3 – Comparison of general quality of life and its domains according to absenteeism related to health and reported morbidity of rural workers, Mato Grosso, Brazil, 2019

Absenteeism & referred morbidity	n(%)	Physical	Psychological	Social relations	Environment	General ±QoL
		Mean ranks				
Absenteeism						
Yes	81(27.1)	120.06	134.99	144.72	140.43	138.04
No	218 (72.9)	161.13	155.58	151.96	153.56	154.44
p value		0.000*	0.064	0.503	0.241	0.122
Health complaints						
Yes	81(27.1)	125.12	136.60	144.22	130.74	131.87
No	218(72.9)	159.24	154.98	152.15	157.16	156.74
p value		0.002*	0.098	0.464	0.018*	0.019*
Morbidity diagnosis						
Yes	30 (10)	95.28	98.13	124.38	117.57	82.98
No	268(89.6)	155.57	155.25	152.31	153.07	156.95
p value		0.000*	0.000*	0.080	0.031*	0.000*

*Caption: *Mann-Whitney test, with p<0.05; ** Kruskal-Wallis test, with p<0.05; ± quality of life.*

Table 4 – Comparison of general quality of life and its domains according to behaviors and habits that influence rural workers' health, Mato Grosso, Brazil, 2019

Behaviors and habits that influence health status	n(%)	Physical	Psychological	Social relations	Environment	General ±QoL
		Mean ranks				
Smoking						
Yes	51(17.5)	150.13	148.17	147.78	143.46	153.45
No	248(82.9)	149.97	150.38	150.46	151.34	149.29
p value		0.991	0.866	0.835	0.551	0.740
Sought health service						
Yes	182(60.8)	141.27	141.30	146.79	150.00	143.37
No	117(39.1)	163.59	163.53	155.00	150.00	160.32
p value		0.028*	0.028*	0.405	0.999	0.079
Medication use						
Yes	25(8.4)	99.02	122.22	140.10	135.36	97.96
No	273(91.3)	154.12	152.00	150.36	150.79	154.22
p value		0.002*	0.094	0.553	0.389	0.001*
Alcohol dependence						
Yes	44(14.7)	124.24	127.08	111.42	121.93	129.43
No	255(85.3)	154.45	153.95	156.66	154.84	153.55
p value		0.031*	0.054	0.001*	0.019*	0.070
Health service used						
Public	88(48.3)	90.81	93.26	88.11	82.73	91.49
Private	88(48.3)	86.19	83.74	88.89	94.27	85.51
Valor de *p*		0.543	0.210	0.917	0.131	0.410
Health service level						
Primary	40(21.9)	105.26	103.38	92.30	91.43	104.76
Secondary	77(42.3)	83.75	81.50	89.71	81.49	82.51
Tertiary	63(34.6)	89.37	93.33	90.32	100.93	91.21
p value		0.099	0.080	0.965	0.087	0.069
Physical activity level**						
Very active	43(14.4)	162.13	155.91	161.22	157.27	149.42
Active	87(29.1)	157.91	157.39	151.86	158.41	165.26
Insufficiently active	79(26.4)	167.22	162.32	165.84	151.04	151.60
Inactive	89(29.8)	119.46	127.31	127.02	135.67	132.27
p value		0.001[a.b.c]	0.032[a]	0.014[a]	0.303	0.062

*Caption: *Mann-Whitney test, with p<0.05; ** Kruskal-Wallis test, with p<0.05; Dunn's post-hoc test, with p<0.05; (a) 'inactive' ≠ 'insufficiently active'; (b) 'inactive' ≠ 'active'; (c) 'inactive' ≠ 'very active'; ± quality of life.*

Table 5 – Final model of regression via GAMLSS with factors related to general quality of life and WHOQOL-bref domains in rural workers, Mato Grosso, Brazil, 2019

WHOQOL-bref	Variables	Estimate	Standard error	Z statistics	*p* value
General quality of life	Intercept	78.90	1.84	42.83	**<0.001**
	Sought health service - Yes	0.03	1.52	0.02	0.982
	Medication use - Yes	-1.79	3.42	-0.52	0.602
	Morbidity complaint - Yes	-2.62	1.68	-1.56	0.121
	Morbidity diagnosis - Yes	-9.86	3.22	-3.06	0.002*
	Alcohol dependence - Yes	-3.09	1.98	-1.56	0.120
	Cardiovascular risk - Yes	-0.67	1.50	-0.45	0.656

To be continued

Table 5 (concluded)

WHOQOL-bref	Variables	Estimate	Standard error	Z statistics	*p* value
Physical domain	Intercept	87.34	1.22	71.63	**<0.001**
	Pesticide handling - Yes	-0.79	1.09	-0.72	0.470
	Occupational accident - Yes	-5.34	1.50	-3.57	**<0.001***
	Noise exposure - Yes	-1.48	1.22	-1.22	0.225
	Dust exposure - Yes	-0.20	1.13	-0.18	0.857
	Sought health service - Yes	0.34	1.20	0.29	0.775
	Medication use - Yes	-3.01	2.63	-1.14	0.254
	Absenteeism - Yes	-3.02	1.28	-2.35	0.019*
	Morbidity complaint - Yes	-0.76	1.20	-0.64	0.525
	Morbidity diagnosis - Yes	-4.31	2.44	-1.77	0.078
	Activity level - Active	3.45	1.61	2.14	0.033 *
	Alcohol dependence - Yes	-2.93	1.39	-2.12	0.035*
Psychological domain	Intercept	80.19	1.37	58.40	**<0.001**
	Acute intoxication - Yes	-2.03	3.65	-0.56	0.579
	Occupational accident - Yes	-3.40	1.98	-1.72	0.087
	Dust exposure - Yes	-0.99	1.32	-0.75	0.455
	Sought health service - Yes	-0.97	2.55	-0.38	0.703
	Medication use - Yes	0.97	6.86	0.14	0.887
	Absenteeism - Yes	0.60	1.70	0.35	0.724
	Morbidity complaint - Yes	-0.23	1.32	-0.17	0.862
	Morbidity diagnosis - Yes	-5.72	5.66	-1.01	0.313
	Activity level - Active	4.69	1.34	3.48	**<0.001 ***
	Alcohol dependence - Yes	-1.83	2.64	-0.70	0.487
Social relations domain	Intercept	75.64	1.09	69.50	**<0.001**
	Sun exposure - Yes	3.08	1.33	2.32	0.021*
	Morbidity diagnosis - Yes	-3.60	1.98	-1.82	0.069
	Alcohol dependence - Yes	-5.58	1.84	-3.04	0.003*
	Physical activity level - Active	2.10	1.65	1.27	0.203
Environment domain	Intercept	74.54	1.97	37.76	**<0.001**
	Occupational accident - Yes	-3.22	1.94	-1.66	0.098
	Sunscreen use - Yes	-1.01	1.42	-0.71	0.480
	Noise exposure - Yes	-2.15	1.51	-1.42	0.156
	Morbidity complaint - Yes	-2.46	1.57	-1.57	0.117
	Morbidity diagnosis - Yes	-4.04	2.30	-1.76	0.080
	Alcohol dependence - Yes	-4.49	1.95	-2.30	0.022*

*Caption: *Significant variable at 5% significance (the same as 95% confidence).*

In the multivariate regression analysis for the psychological domain model, only the covariate level of physical activity (active) had a positive influence, contributing to the increase in the psychological domain scores, when the other covariates remained constant in the model. As for the social relations domain, the covariate sun exposure (yes) contributed to the increase in scores, while the covariate alcohol dependence (yes) contributed to the decrease of scores in the social relations domain. In the environment domain, only the covariate alcohol dependence (yes) had an influence on this domain, contributing to the decrease of its scores, when the other variables remained constant in the model.

DISCUSSION

In the present study, we observed a prevalence of 16.4% in the occurrence of occupational accidents. This phenomenon was also reported in the Southern region, where there was also a correlation between the occurrence of occupational accidents and health conditions[19]. In the Southeast region, there was an occurrence of occupational accidents resulting from the agricultural machinery handling[20], as well as pesticide handling in the Northeast region[9]. In Michigan, United States, the highest prevalence of non-fatal rural occupational accidents was found among men, and the most common types of injury were bruises and fractures (19.9%)[21]. Accidents in rural work can be due to fatigue, operation in extreme conditions, recklessness, mechanical failures, distraction, jokes, overconfidence and lack of Personal Protective Equipment (PPE)[22-23]. In order to prevent occupational accidents in the rural environment, it is essential to know the regulatory standards (RS), as well as the guarantee of a safe work environment from the adoption of control measures that seek to prevent accidents[24].

In the present study, it was evidenced that the occurrence of occupational accident had repercussions in the presence of lower scores in the physical and psychological domains. This phenomenon may be linked to the changes that compromise daily activities, such as mobility, work and changes in autonomy for daily activities caused by the accident. Furthermore, the psychological impact caused by occupational accidents may result from significant changes in the psychological state of the injured, which can change workers' perceptions and behavior[25]. At the same time, the absence of work for health reasons (absenteeism) acted as a predictor in the decrease of the scores in the physical domain assessment. Work absenteeism due to illness can contribute for the appearance of depression and social isolation, because, in addition to providing conditions for economic reproduction, work promotes family's personal recognition and social reproduction[26]. A review study showed that, in rural areas, staff turnover rates are high, especially among male workers, young people and people with less education, and that absenteeism was justified by the presence of musculoskeletal and respiratory diseases and injuries from external

causes, common characteristics of rural activity that result from excessive physical exertion and unfavorable working conditions[27].

The rural workers who reported having morbidity diagnoses had lower scores in the general QoL than those who did not report these conditions. It is known that the influence that health conditions have on the QoL of people[7,28] is well founded in the literature, since the presence of morbidities promotes limitations in daily activities, due to the presence of pain and discomfort, dependence on medications or treatments and decreased autonomy[29].

The prevalence of alcohol dependence was 14.7%, verifying that this behavior had a negative influence on physical, social relations and environment domains. Similarly, in Minas Gerais, a study concluded that subjects considered alcohol dependent recorded lower averages in all domains of QoL[30]. QoL decline among alcohol-dependent workers is expected, because, in addition to the implications on physical performance and social relations, alcohol consumption promotes health consequences, such as premature deaths, development of chronic diseases and social conditions of greater vulnerability[31]. Considering the consequences of excessive alcohol consumption, it is necessary to monitor this population. In this regard, it is imperative to awaken health professionals, especially nurses working in rural areas, so that they are committed to providing qualified assistance, given that individuals who are properly monitored can progress in treatment, restore self-control over alcohol use and improve their QoL[32].

The rural workers who declared sun exposure presented higher scores for the social relations domain. The decrease in sun exposure is related in the literature to a higher incidence of seasonal depression, since, in places where sunlight is higher, the occurrence of seasonal affective disorders is less than 1%, while, in regions with little sunlight, there are more records of seasonal affective disorders[33]. Luminosity affects the expression of receptors in neurons for well-being-linked neurotransmitters. Thus, for individuals exposed to the higher incidence of solar, there is a lower occurrence of affective disorders[33], thus interfering in social relations between individuals.

Therefore, it is known that the use of sunscreen has been recommended to protect against injuries related to excessive sun radiation exposure. Regarding this issue, the majority (53.5%) of the workers investigated in this study reported not using sunscreen during their work activities. An even more alarming result was evidenced in a survey carried out in the state of Rio de Janeiro, in which about 88% of rural workers in Rio de Janeiro reported not using sunscreen[34]. These results demonstrate the need for health education actions to improve adherence to sunscreen use among these workers.

Another important occupational exposure refers to the presence of noise in daily rural work. Thus, it was identified that, among the rural workers investigated, noise was configured as a stressor factor. This relationship was also presented in other studies[35-36], in which the presence of excessive noise was also observed in the work environment.

Regarding pesticide handling, 30% of the workers surveyed reported handling them. A close result was evidenced in a study conducted in the state of Rio de Janeiro, in which pesticide use was 21%[34]. A study conducted in Casimiro de Abreu, Rio de Janeiro, showed that 56.7% of rural workers reported contact with pesticides and chemical fertilizers, and 54.3% reported the presence of some symptom of intoxication (headache, dyspnea, body itching, nausea and sinusitis)[37].

Regarding objective health data, this research identified a significant number of workers with inadequate weight (overweight and obese), BP outside normal parameters and a significant percentage of workers with the presence of cardiovascular risk. Similar data were found in a study conducted with rural workers in southern Brazil, in which 28.9% of the studied population presented a high risk of developing cardiovascular diseases[38].

Occupational dust exposure was considered, in this study, as a stressful factor, reaching 62.9% of the workers studied. The relationship between soybean dust exposure and the emergence of health disorders, especially respiratory disorders, is already well described in the literature, and is considered a risk to workers' health, because it is significantly related to respiratory symptoms such as asthma, lung cancer, hypersensitivity pneumonitis and other interstitial lung diseases[39].

The active practice of physical activity was associated with the presence of higher scores in the physical and psychological domains. The highest QOL scores may result from relationships and communications promoted by interactions carried out during the practice of physical activities, especially in groups[40] acting as an agent to promote workers' health, contributing to flexibility, breathing pattern, sleep quality and weight reduction, reducing the percentage of body fat, symptoms of stress, anxiety, tension, depression, irritability, social dysfunction and increased self-care[41].

Regarding the role of nursing in the rural context, the presence of some challenges can be listed, such as geographic distance, mobility difficulties and access to health resources, providing assistance to people who perform unhealthy work activities, sometimes in unfavorable environments, in adverse weather conditions, and frequent exposure to handling chemicals harmful to health[42]. Despite these difficulties, the role of nurses in the rural context is very important, due to the knowledge gap regarding the work of these professionals in the rural environment, as well as the particularity and vulnerability, that require health care aimed at this population, denoting the possibility of investigations on the professional practice of nursing in the rural context, contributing to the system of scientific knowledge of nursing[43].

Finally, the prevalence of workers who sought health services was 60.8%, a result close to that evidenced by Brust et al. (2019)[31], in which about 69.1% of rural workers from Rio de Janeiro reported having sought health care. These results demonstrate the need for health services to be prepared and equipped with the necessary tools to assist the population.

Study limitations

As a limitation, the fact that this research was carried out in the work environment may, to some extent, have interfered in workers' responses. Another limitation refers to the study design, which, because it is cross-sectional research, it is not possible to establish cause-and-effect relationships. Even in the face of these limitations, it is considered that this research has as a strong point the reach of a category of workers that is difficult to access and that represents an important part of the Brazilian economy.

Contributions to nursing, health, and public policies

This research can help guide the health care of rural workers, offering subsidies to improve the efficiency of care policy planning with a view to reducing health vulnerability and, thus, improving workers' QoL.

CONCLUSIONS

The findings obtained in this study show that rural workers working in the context of soybean production are exposed to a worrying panorama regarding the presence of high risk for illness resulting from overweight, sedentary lifestyle, alcohol dependence, stressor exposure (noise and dust), as well as absence from work due to occupational accidents and morbidities present among these workers. Implications, such as having diagnosis of morbidity, having experienced occupational accidents, having been out of work due to health reasons and being dependent on alcohol have negatively influenced QoL. The active practice of physical activity and sun exposure positively influenced the QoL scores of rural workers working in the context of soybean.

SUPPLEMENTARY MATERIAL

Oliveira, JCAX. The quality of life of men rural workers inserted in the context of soy. 2020. Thesis (PhD in Nursing). Federal University of Mato Grosso. Available from: https://cms.ufmt.br/files/galleries/225/Tc9540b1094525f04a104b2cecd508a3aa21244be.pdf

REFERENCES

1. Bica I, Pinho LMD, Silva BEM, Aparício G, Duarte J, Costa J, et al. Sociodemographic influence in health-related quality of life in adolescents. Acta Paul Enferm. 2020;33:1-7. https://doi.org/10.37689/acta-ape/2020AO0054
2. World Health Organization (WHO). The World Health Organization Quality of Life Assessment (WHOQOL): position paper from the World Health Organization. Soc Sci Med. 1995;41(10):1403-1. https://doi.org/10.1016/0277-9536(95)00112-K
3. Ministério da Saúde (BR). Organização Pan-Americana de Saúde (OPAS). Indicadores básicos para a saúde no Brasil: conceitos e aplicações[Internet]. 2008 [cited 2021 apr 14]. Available from: http://tabnet.datasus.gov.br/tabdata/livroidb/2ed/indicadores.pdf
4. Silva RM, Limas BT, Pereira LS. Contexto de trabalho e custo humano no trabalho: um estudo com trabalhadores portuários de transporte. Barbaróí. 2016; 46: 98-118. https://doi.org/10.17058/barbaroi.v0i46.6410
5. Companhia Nacional de Abastecimento. Acompanhamento da safra de grãos brasileira[Internet]. Brasília: Conab; 2020 [cited 2021 Apr 14]. Available from: www.conab.gov.br
6. Siqueira DF, Moura RM, Laurentino GEC, Silva GPF, Soares LDA, Lima BRDA. Rural workers' quality of life of and agrotoxics: a systematic review. Rev Bras Ciênc Saúde. 2012;16(2):259-66. http://doi:10.4034/RB.2012.16.02.22
7. Moreira JPL, Oliveira BLCA, Muzi CD, Cunha CLF, Brito AS, Luiz RR. Rural workers' health in Brazil. Cad Saúde Pública. 2015;31;1698-708. https://doi.org/10.1590/0102-311X00105114
8. Ximenes Neto FRG, Aurélio DO, Santos FD, Ferreira VES, Pereira RAR, Linhares MSC. Perfil sociodemográfico e trabalhista dos trabalhadores rurais vítimas de Acidente no semiárido cearense. Enferm Foco [Internet]. 2016 [cited 2021 Apr 14];7(1):56-60. Available from: http://revista.cofen.gov.br/index.php/enfermagem/article/view/668/286
9. Santana CM, Costa AR, Nunes RMP, NuneS NMF, Peron AP, Melo-Cavalcante AAC et al. Exposição ocupacional de trabalhadores rurais a agrotóxicos. Cad. Saúde coletiva. 2016; 24(3):301-307. https://doi.org/10.1590/1414-462X201600030199
10. The Whoqol Group. Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment. Psychol Med. 1998;28(3):551-558. https://doi.org/10.1017/S0033291798006667
11. Fleck MPA, Louzada S, Xavier M, Chachamovich E, Vieira G, Santos L, Pinzon V. Aplicação da versão em português do instrumento abreviado de avaliação da qualidade de vida "WHOQOL-bref". Rev Saúde Pública. 2000;34(2):178-83. https://doi.org/10.1590/S0034-89102000000200012
12. Oliveira JCAX. A qualidade de vida de homens trabalhadores rurais contexto da soja[Tese]. 2020. 2020[cited 2021 Apr 14]. Available from: https://cms.ufmt.br/files/galleries/225/Tc9540b1094525f04a104b2cecd508a3aa21244be.pdf
13. Matsudo S, Araújo T, Matsudo V, Andrade D, Oliveira LC, Braggion G. Reproducibility and validity of the International Physical Activity Questionnaire (IPAQ) in elderly men. Rev Bras Ativ Fís Saúde. 2001;6(2):5-18. https://doi.org/10.1590/S1517-86922007000100004
14. Masur J, Monteiro MG. Validation of the "CAGE" alcoholism screening test in a Brazilian psychiatric inpatient hospital setting. Braz J Med Biol Res[Internet]. 1983 [cited 2021 Apr 14];16(3):215-8. Available from: https://pubmed.ncbi.nlm.nih.gov/6652293/
15. Associação Brasileira para o Estudo da Obesidade e da Síndrome Metabólica Diretrizes brasileiras de obesidade[Internet]. 4.ed. São Paulo; SP. 2016 [cited 2021 Apr 14]. Available from: https://abeso.org.br/wp-content/uploads/2019/12/Diretrizes-Download-Diretrizes-Brasileiras-de-Obesidade-2016
16. Malachias MVB, Neves MFT, Mion Júnior D, Silva GV, Lopes HF, Oigman W. 7TH Brasilian Guideline of arterial hypertension: Chapter 4- Estratificação de Risco Cardiovascular. Arq Bras Cardiol. 2016;107(3):18-24. https://doi.org/10.5935/abc.20160154
17. Malachias MVB, Gomes MAM, Nobre F, Alessi A, Feitosa AD, Coelho EB. 7TH Brasilian Guideline of arterial hypertension: Chapter 2 - Diagnóstico e Classificação. Arq Bras Cardiol. 2016;107(3):7-13. https://doi.org/10.5935/abc.20160152

18. Stasinopoulos DM, Rigby RA. Generalized additive models for location scale and shape (GAMLSS) in R. J Statistic Softw[Internet]. 2007 [cited 2021 Apr 14];23:1-10. Available from: https://www.jstatsoft.org/article/view/v023i07

19. Begnini S, Almeida LEDF. Desenvolvimento e acidentes de trabalho no meio rural de Santa Catarina. Rev Bras Desenvolv Reg. 2018;5(2):111-136. http://doi:10.7867/2317-5443.2017v5n2p111-136

20. Baesso MM, Modolo AJ, Baesso RCE, Trohello E. Segurança no uso de máquinas agrícolas: avaliação de riscos de acidentes no trabalho rural. Rev Bras Eng Biossist. 2018;12(1):101-9. https://doi.org/10.18011/bioeng2018v12n1p101-109

21. Kica J, Rosenman KD. Multisource surveillance for non-fatal work-related agricultural injuries. J Agromed. 2020;25(1):86-95. https://doi.org/10.1080/1059924X.2019.1606746

22. Fernandes HC, Madeira NG, Teixeira MM, Cecon PR, Leite DM. Acidentes com tratores agrícolas: natureza, causas e consequências. Eng Agricult. 2014;22:361-71. https://doi.org/10.13083/reveng.v22i4.399

23. Ambrosi JN, Maggi MF. Acidentes de trabalho relacionados às atividades agrícolas. Acta Iguazu. 2013;14(2):1-13. https://doi.org/10.48075/actaiguaz.v2i1.7887

24. Lima VAP, Oliveira AF, Almeida Alves D, Oliveira JR. Segurança e saúde no ambiente de trabalho rural do Alto Jequitinhonha, Minas Gerais. Scientific Electronic Archives. 2021;14(3):71-7. https://doi.org/10.36560/14320211243

25. Cardoso J, Areosa J, Veloso Neto H. Impacte do acidente de trabalho grave na vida do trabalhador. Cesqua[Internet]. 2020 [cited 2021 dec 29];1(3):1-17. Available from: https://www.cesqua.org/index.php/cesqua/article/view/45

26. Burille A, Gerhardt TE, Lopes MJM, Dantas GC. Subjetividades de homens rurais com problemas cardiovasculares: cuidado, ameaças e afirmações da masculinidade. Saúde Soc. 2018;27:435-447. https://doi.org/10.1590/S0104-12902018162943

27. Hirai VHG, Santos BM, Ribeiro S, Teston EF. Redução de perícias médicas baseada na gestão de absenteísmo, rotatividade e qualidade de vida no trabalho. Rev Eletrôn Gestão Saúde. 2018;14(3):393-406. http://doi.10.26512/gs.v9i3.20291

28. Bortolotto CC, Loret de Mola C, Tovo-Rodrigues L. Quality of life in adults from a rural area in Southern Brazil: a population-based study. Rev Saúde Pública. 2018;52(Supl 1):4s. https://doi.org/10.11606/S1518-8787.2018052000261

29. Almeida-Brasil CC, Silveira MR, Silva KR, Lima MG, Faria CDCM, Cardoso CL, et al. Quality of life and associated characteristics: application of WHOQOL-BREF in the context of Primary Health Care. Ciênc Saúde Colet. 2017;22:1705-16. https://doi.org/10.1590/1413-81232017225.20362015

30. Martins ME, Ribeiro LC, Baracho RA, Feital TJ, Ribeiro MS. Qualidade de vida e consumo de alcoólicos em hepatopatas do sexo masculino. Arch Clin Psychiatry. 2012;39(1):5-11. https://doi.org/10.1590/S0101-60832012000100002

31. World Health Organization (WHO). Global status report on alcohol and health 2018. World Health Organization [Internet]. 2019 [cited 2021 Apr 14]. Available from: https://www.who.int/substance_abuse/publications/global_alcohol_report/en/

32. Franklin TA, Santana JDS, Silva MCP, Silva FG, Silva MTA, Fernandes JD, et al. Alcoolismo e estigma: uma análise da produção científica. Braz J Develop. 2021;7(8):79257-71. http://doi:10.34117/bjdv7n8-235

33. Juruena MF, Cleare AJ. Superposição entre depressão atípica, doença afetiva sazonal e síndrome da fadiga crônica. Braz J Psychiatry. 2007;29:s19-s26. http://doi:10.1590/S1516-44462007000500005

34. Brust RS, Oliveira LPM, Silva ACSS, Regazzi ICR, Aguiar GS, Knupp VMAO. Epidemiological profile of farmworkers from the state of Rio de Janeiro. Rev Bras Enferm. 2019;72(supl. 1):122-128, 2019. https://doi.org/10.1590/0034-7167-2017-0555

35. Silva MC, Luz VB, Gil D. Ruído no hospital universitário: impacto na qualidade de vida. Audiol Commun Res. 2013;18(2):109-19. http://doi:10.1590/s2317-64312013000200009

36. Pommerehn J, Santos Filha VAV, Miolo SB, Fedosse E. O ruído e a qualidade de vida na perspectiva de trabalhadores de postos de combustíveis. Rev CEFAC. 2016;18(2):377-84. http://doi:10.1590/1982-0216201618213515

37. Silva AP, Camacho ACLF, Menezes HF, Santos ACFT, Abreu Moniz M, Santos RD, Souza Panetto. Riscos à saúde do trabalhador rural exposto ao agrotóxico. Saúde Colet. 2020;10(52):2094-111. https://doi.org/10.36489/saudecoletiva.2020v10i52p2094-2111

38. Cezar-Vaz MR, Bonow CA, Mello MCVA, Xavier DM, Vaz JC, Schimith MD. Use of global risk score for cardiovascular evaluation of rural workers in Southern Brazil. Scientif World J. 2018;1-5. http://doi:10.1155/2018/3818065

39. Saleiro S, Rocha L, Bento J, Antunes L, Costa JT. Occupational exposure to dust: an underestimated health risk? J Bras Pneumol. 2019; 45(4): e20170396. http://doi:10.1590/1806-3713/e20170396.

40. Silva RS, Silva I, Silva RA, Souza L, Tomasi E. Atividade física e qualidade de vida. Ciênc Saúde Colet. 2010;15:115-20. http://doi:10.1590/s1413-81232010000100017

41. Corrêa AC, Oliveira MS, Coelho LRP, Rezende LFC, Kashiwabara TGB. Benefícios da atividade física na saúde e qualidade de vida do trabalhador. In: Kashiwabara TBL, Rocha LLV, Barros N, et al, organizadores. Medicina Ambulatorial IV com ênfase na medicina do trabalho. 6. Ed. Minas Gerais: Dejan; 2019. p. 51-64.

42. Lima ARA, González JS, Ruiz MDCS, Heck RMM. Interfaces da enfermagem no cuidado rural: revisão integrativa. Texto Contexto Enferm. 2020;29:e20180426. https://doi.org/10.1590/1980-265X-TCE-2018-0426

43. Silva BND, Araújo VKGD, Felix RS, Rebouças DGDC, Silva SYB, Pinto ESG. Estado da arte da produção stricto sensu da enfermagem brasileira sobre saúde da população rural. Esc Anna Nery. 2021;25(4):e20200487. http://doi.org/10.1590/2177-9465-EAN-2020-0487