REVISTA CEFAC
SPEECH, LANGUAGE, HEARING SCIENCES AND EDUCATION JOURNAL
Rev. CEFAC. 2016 Nov-Dez; 18(6):1302-1309 doi: 10.1590/1982-0216201618612815

Original articles

Self-perception of hearing disorders, habits, and hearing loss risk factors in farmers

Autopercepção de dificuldade auditiva, hábitos e fatores de risco para perda auditiva em agricultores

Suzelaine Taize Stadler[1]
Vanessa Veis Ribeiro[2]
Denise Maria Vaz Romano França[3]

[1] Universidade Estadual do Centro-Oeste/ UNICENTRO, Irati, PR, Brasil.
[2] Faculdade de Odontologia de Bauru – Universidade de São Paulo – FOB/USP, Bauru, SP, Brasil.
[3] Universidade Estadual do Paraná/ UNESPAR- Campus de Paranaguá, PR, Brasil.

Conflict of interest: non-existent

Received on: September 09, 2015
Accepted on: December 14, 2015

Mailing address:
Suzelaine Taize Stadler
Universidade Estadual do Centro-Oeste/ UNICENTRO
Departamento de Fonoaudiologia
153 Km 7, Riozinho – Irati – PR – Brasil
CEP: 84500-000
E-mail: fonoaudiologasuzelaine@hotmail.com

ABSTRACT

Purpose: to investigate and to associate hearing disorders self-perception, habits and hearing loss risk factors in farmers.

Methods: descriptive and exploratory cross-sectional study. 57 farmers from both sexes, age from 19 to 69 years, and time of farming activities from one to 45 years, participated in the study. A questionnaire with identification data, profession data, general health, hearing health, and medical assistance was addressed to the participants. Data were analyzed using the following non-parametric statistical tests: Mann-Whitney, Equality of two proportions, and Chi-square ($p \leq 0.05$).

Results: The majority of farmers did not report hearing complaints; regarding risk factors, most of participants reported contact to pesticides and also not to having any guidance about the risks of farming to hearing health; there was higher report of noise exposition and handling pesticides in males; big part of participants used individual protection devices while operating noise equipment and were handling pesticides; there was no statistical differences among hearing factors and risk factors.

Conclusion: As conclusion, the studied population did not have perception about hearing disorders, despite direct handling pesticides and not ever have had guidance about hearing risks in farming activity. Most of the subjects operated noise equipment and had contact to pesticides in their jobs, but they used individual protection device.

Keywords: Agriculture; Environmental Exposure; Hearing Loss; Occupational Risks; Occupational Health

RESUMO

Objetivo: investigar e associar a autopercepção de dificuldade auditiva, os hábitos e os fatores de risco para a perda auditiva em agricultores.

Métodos: trata-se de um estudo transversal, de caráter descritivo e exploratório. Participaram do estudo 57 agricultores, de ambos os gêneros, faixa etária entre 19 e 69 anos, e tempo de atuação agrícola entre um e 45 anos. Os sujeitos responderam um questionário com questões relacionadas a dados de identificação, ocupacionais, saúde geral, saúde auditiva e assistência médica. Os dados foram analisados utilizando-se os testes não-paramétricos Man-Whitney, Igualdade de Duas Proporções e Qui-quadrado ($p \leq 0,05$).

Resultados: observou-se que a maioria dos agricultores relatou não possuir queixa auditiva; em relação aos fatores de risco para a perda auditiva a maioria relatou ter contato com agrotóxicos e não receber orientações sobre os riscos audiólogicos da prática agrícola; houve maior relato de exposição ao ruído e contato com agrotóxico em sujeitos do sexo masculino; grande parte dos sujeitos faziam utilização de equipamento de proteção individual quando trabalhavam com instrumento ruidoso e tinham contato com agrotóxico; não houve diferença estatística entre os fatores de ouvir e os fatores de risco.

Conclusão: conclui-se que a população estudada não possuía percepção de dificuldade auditiva, apesar de ter contato direto com agrotóxicos e nunca ter recebido orientações sobre os riscos audiológicos da prática agrícola. A maioria dos sujeitos que fazia uso de instrumento de trabalho ruidoso e que tinha contato com agrotóxicos, utilizava equipamento de proteção individual.

Descritores: Agricultura; Exposição Ambiental; Perda Auditiva; Riscos Ocupacionais; Saúde do Trabalhador

INTRODUCTION

Studies analyzing the exposition to noise risk and ototoxic products to farmers[1,2]showed, beside the effects caused by the exposition to these factors in general health, consequences to hearing health[3]. Farmers are part of the group of works exposed to noise and defensive farming products[4] that, due to lack of information and guidance about the risk of the defensive products to health, may overestimate the benefic effects of these products in plantation and disregard the detriments to health in short, medium and long term[5,6].

Among the several factors making farmers susceptible to the harmful effects caused by pesticides, the highlight goes to the hard access to information and education by the products' users, as the low control about its production, distribution, and use[2,7].

Literature have been evidencing the ototoxic and neurotoxic power of some pesticides to both peripheral and central hearing system, and also pointing out the noise of some farming equipment to be the factor that interacting to pesticides may potentiate their effects, causing disturbances in general and hearing health[8,9]. The lack of individual protection device and proper environment may also be considered as potential factors to hearing loss risk[10]. There are evidences of hearing loss as premature symptom of poisoning[11].

Irati city is located in the countryside of *Paraná* state in Brazil and is considered of risk to hearing loss development due to pesticides use. This happen because the city has predominant rural economy with population mainly composed by farmers of medium-low income, educational level of incomplete elementary school. Besides, there is not much instruction regarding the hearing disorders and also the frequent contact to noise or pesticides to be the cause or potential of this disorder[12].

Therefore, the purpose of the current study is to investigate and to associate the self-perception of hearing disorders, hearing loss risk factors, and habits in farmers.

METHODS

This research respected the 466/12 resolution of *Conselho Nacional de Ética em Pesquisa (CONEP)*. Volunteers were informed about the research and signed the informed consent. The research was approved by the Ethic in Research Committee of *Universidade Estadual Centro-Oeste* under the number 023/201.

The study is cross-sectional, descriptive and exploratory, of quantitative nature. Subjects were recruited in meetings organized by workers member of the rural community of *Irati* city, *Paraná* State. The convenience sample was built of 57 farmers, age between 19 and 69 years (mean of 44.38), 14 (24.6%) females, and 43 (75.4%) male. Working period in farming was from one to 45 years (mean of 31.84±15.55 years).

Identification questionnaire, built by the researchers, was addressed to farmers with written and multiple choice questions regarding identification, work, general and hearing health, and medical assistance due to presented symptoms. The participants were guided to mark the sentences correspondent to their reality, as many as they judged necessary in each multiple choice questions. In addition, the questionnaire also had written questions regarding identification and work data, which determined the professional activity period.

Farmers with at least one year of farming activity and volunteering to join the research were included in the sample. The subjects reporting complaints leading to hearing loss developed before farming activity suspicion, hereditary factors, previous history of repetition otitis; hearing loss due to bacterial infection or post-birth virus, and extern and/or medium ear anatomic deviations.

Data were analyzed statistically using the non-parametric tests "Mann Whitney", "Two Proportions Equality", and "Chi-square". The significance level of 5% ($p=0.05$) was adopted.

RESULTS

Table 1 presents significant majority of farmers without hearing complaint (p=<0.001). Regarding the risk factors to hearing loss, most of the farmers reported to handle pesticide (p=<0.001) and not have received guidance about hearing risks with farming activity (p=<0.001). Regarding habits, farmers reported not to be smokers (p=<0.001).

Table 2 demonstrates the lack of association of farming activity duration to hearing disorders self-perception, and hearing loss risk factors.

Table 3 presents most of subjects operating noise work equipment (p=0.025) and handling pesticides (p=0.002), and also used individual protection device.

Table 4 demonstrates no relation between the reports of guidance about hearing risks in farming activities with operating noise equipment, and using individual protection device in farmers.

Table 5 presents no significant relation among the factors and habits to hearing loss development, and hearing disorders self-perception.

Table 1. Self-perception of hearing disorders and hearing risk habits distribution to hearing loss in farmers.

Variables	Answer	n	%	p-valor
Hearing self-perception				
hearing disorders	No	44	77,2%	<0,001*
	Yes	13	22,8%	
Hearing loss risk factors				
Noise equipment	No	27	47,4%	0,574
	Yes	30	52,6%	
Handling pesticides	No	13	22,8%	<0,001*
	Yes	44	77,2%	
Guidance about hearing risks in farming activity	No	39	68,4%	<0,001*
	Yes	18	31,6%	
Individual protection device use	No	27	47,4%	0,574
	Yes	30	52,6%	
Hearing loss risk habits				
Smoking	No	48	84,2%	<0,001*
	Yes	9	15,8%	
Alcoholism	No	32	56,1%	0,190
	Yes	25	43,9%	

*Statistical significant values (p≤0.05) – Two proportion equality test –
Subtitles: n= number of subjects; %= subjects' percentage

Table 2. Farming working period association to hearing disorders self-perception and hearing loss risk factors to farmers.

Variables	Answer	Working period						p-valor
		From 1 to 5 years		From 5 to 10 years		More than 10 years		
		n	%	n	%	n	%	
Hearing self-perception								
Hearing disorders	No	2	100%	0	0%	42	78%	0,136
	Yes	0	0%	1	100%	12	22%	
	Total	2	4%	1	2%	54	95%	
Hearing loss risk factors								
Noise equipment	No	1	50%	1	100%	25	46%	0,565
	Yes	1	50%	0	0%	29	54%	
	Total	2	4%	1	2%	54	95%	
Handling pesticides	No	0	0%	1	100%	12	22%	0,678
	Yes	2	100%	0	0%	42	78%	
	Total	2	4%	1	2%	54	94%	
Guidance about hearing risks in farming activity	No	2	100%	1	100%	36	67%	0,962
	Yes	0	0%	0	0%	18	33%	
	Total	2	4%	1	2%	54	95%	
Individual protection device use	No	1	50%	1	100%	25	46%	0,565
	Yes	1	50%	0	0%	29	54%	
	Total	2	4%	1	2%	54	95%	

*Statistical significant values ($p \leq 0.05$) – Chi-square test
Subtitles: n= number of subjects; %= subjects' percentage

Table 3. Relation between the report of using individual protection device while operating noise equipment and the use of protection device in farmers.

Individual protection device use		No		Yes		p-valor
		n	%	n	%	
Noise equipment	No	17	63%	10	37%	0,025*
	Yes	10	33%	20	77%	
	Total	27	55%	20	45%	
Handling pesticides	No	12	44%	1	3%	0,002*
	Yes	15	56%	29	97%	
	Total	27	47%	30	53%	

*Statistical significant values ($p \leq 0.05$) – Chi-square test
Subtitles: n= number of subjects; %= subjects' percentage

Table 4. Relation between the report of guidance about hearing risks in farming activity while operating noise equipment and the use of individual protection device in farmers (n: 57).

Guidance on audiological risks of agricultural practice		No		Yes		p-valor
		n	%	n	%	
Noise equipment	No	16	41%	11	61%	0,737
	Yes	23	59%	7	39%	
	Total	39	68%	18	32%	
Handling pesticides	No	10	26%	3	17%	0,967
	Yes	29	74%	15	83%	
	Total	39	68%	18	32%	

*Statistical significant values ($p \leq 0.05$) – Chi-square test
Subtitles: n= number of subjects; %= subjects' percentage

Table 5. Relation among the hearing disorders self-perception, with hearing loss risk factors and habits in farmers (n=57).

Variables	Answer	Hearing disorders				p-valor
		No		Yes		
		n	%	n	%	
Hearing loss risk factors						
Noise equipment	No	9	20%	4	30%	0,436
	Yes	35	80%	9	70%	
	Total	44	77%	13	23%	
Handling pesticides	No	9	20%	4	30%	0,436
	Yes	35	80%	9	70%	
	Total	44	77%	13	23%	
Guidance about hearing risks in farming activity	No	28	64%	11	85%	0,153
	Yes	16	36%	2	15%	
	Total	44	77%	13	23%	
Individual protection device use	No	22	50%	5	38%	0,969
	Yes	22	50%	8	62%	
	Total	44	77%	13	23%	
Hearing loss risk habits						
Smoking	No	38	86%	10	77%	0,412
	Yes	6	14%	3	23%	
	Total	44	77%	13	23%	
Alcoholism	No	25	57%	7	54%	0,850
	Yes	19	43%	6	46%	
	Total	44	77%	13	23%	

*Statistical significant values ($p \leq 0.05$) – Chi-square test
Subtitles: n= number of subjects; %= subjects' percentage

DISCUSSION

The numbers of publications about hearing disorders self-perception, habits and hearing loss risk factors in farmers is yet rare, mainly due to the sanative model that originated Speech Language Pathology: seeking the control and treatment of diseases[13]. In this context, it is necessary to investigate habits and risk factors to hearing loss development that this population is exposed to, since it may start some difficulties related to general and hearing health of subjects[14]. In small towns, as the one the study was carried out (*Irati-Pr)*, small farmers without precision farming and working almost handicraft in family agriculture are predominant, the risk factors may grow, and, therefore, it is necessary to investigate it.

The population of this study has a work organization composed by the family; however, the study had the predominance of males in the sample. This finding corroborates to other studies showing the predominance of men in activities in rural environment[15-17]. This fact is probably related to male farmers be considered culturally more resistant to hard work, and also to be the providers of organization dynamic of rural workers population[18,19]. Still in sample profile, most participants reported to be non-smokers, similar to other studies with farmers[8,17].

The significantly majority of farmers in this study reported direct handling pesticides, but not ever have had received guidance about the hearing loss risks in this practice. This data is important and harmful, because literature points out the annual incidence of intoxication by pesticides in workers is 2.2%[17]. Besides, handling pesticides may take to acute or chronic intoxication, and both may lead to death[20]. Acute intoxication leads to complaints and symptoms after exposition, which is: weakness, vomit, and headache[21]. Chronic intoxications are those needing precise diagnose, performed by multi-discipline team including dermatologists, neurologists, immunologists, oncologists, and others, in order to have accurate clinic-epidemiologic reasoning, because this intoxication is gradual and progressive, without precise complaint and symptoms allowing an easy clinical condition identification[22].

Association of the duration of time in farming with hearing disorders self-perception and the hearing loss

risk factors was not found: operating noise equipment, handling pesticides, guidance about hearing loss risk in farming activity, and individual protection device (IPD) use (Table 2). Regarding duration of time, studies reported the incorrect use of IPD associated to noise equipment may lead to hearing loss development in approximate four years[9,19]. These findings are important but were not confirmed in this research. The reason may be the hearing health mantainence depends on set of factors as the quantity and the frequency of pesticides exposition, the concurrent operating noise equipment, and the lack of individual protection[4,8,23-25]; in the current research, most subjects operated noise equipment at work, handled pesticides, and used individual protection device (Table 3). These findings are different from other studies[5,10] of the same theme, because most farmers reported not using the protection device for several reasons, as: financial issues to acquire the individual protection device, troubles using it due to warmth, discomfort and lack of habit to use it[10,23].

Most farmers in the study did not report hearing disorders (Table 1), and also did not relate habits and risk factors to hearing loss development (Table 5). Possible explanation to this finding is the lack of guidance about hearing loss due to farming activity, predominant in the sample (Table 1), whether due to noise, pesticides, or both factors[23]. The lack of relation among the guidance about hearing loss risks due to farming activity with operating noise equipment, and the use of individual protection device (Table 4) reinforce this finding. This is something of concern because, despite the researched risks factors may cause damage in hearing system and also in subjects' general health, the hearing features of loss induced by noise associated to chemical substances may be closer to the presbycusis features. To differential diagnose of this type of hearing accuracy is necessary to perform detailed anamneses and complete clinical assessment. Many patients are extremely difficult to identify the cause of hearing loss, because there is a summation of causes[4]. Besides, the time to clinical condition to be installed, when is not due to acute intoxication, is gradual and long, approximated four years[9,19].

Other researches[9,26,27] already pointed out the need to control and guidance about the use of pesticides and the danger of noise exposition, promoting the knowledge and alarming the farmers about the hearing risks and the damage to health caused by farming activity without proper care and the individual protection devices used correctly. This is applied specially to the population of family agriculture, in which farmer handle the pesticide and the family also is exposed to the product, once everyone has some contribution to the agriculture production[21], mainly in plantation and harvest[8]. In addition, the family residence is usually close to plantation[28].

However there are few coverage and insertion of collective health programs promoting the knowledge and the capability to daily practice of rural population[24]. So, it is needed to recognize the complexity of the troubles caused by the indiscriminate use of pesticides in several ways, which requires specific public politics to be implemented, and the making educational and health actions to rural populations[24,29], mainly to farmers in family agriculture.

Among the limitations of the current study are the small and convenient sample, the predominance of male participants, and the use of not valid tool. More studies are needed on the theme, verifying whether the findings of this research are confirmed in studies sample size based on sample calculus, random sample selection, and considering group allocation in farming types, social class, and scholarship of participants.

CONCLUSION

The studied population did not have hearing disorders self-perception, despite direct handling pesticide and not ever have had guidance about hearing risk in farming activities. Most of the subjects operating noise equipment and handling pesticide used individual protection device; any other significant association were found among hearing disorder self-perception, hearing loss risk factors and habits. Yet, actions promoting knowledge and capability of these workers regarding the risks to general and hearing health need to be done.

REFERENCES

1. Delecrode CR, Freitas TD, Frizzo ACF, Cardoso ACV. Prevalence of tinnitus in workers exposed to noise and organophosphates. Int Arch Otorhinolaryngol. 2012;16(3):328-34.
2. Oliveira CCC, Vargas MM, Sena TRR. Saúde auditiva e qualidade de vida em trabalhadores expostos à agrotóxicos. Ciênc Saúde Coletiva. 2012;12(4):167-9.

3. Kós MI, Miranda MF, Guimarães RM, Meyer A. Avaliação do sistema auditivo em agricultores expostos à agrotóxicos. Rev CEFAC. 2014;16(3):941-8.
4. Hoshino ACH, Pacheco-Ferreira H, Tagushi CK, Tomita S, Miranda MF. A autopercepção da saúde auditiva e vestibular de trabalhadores expostos a organofosforados.Rev CEFAC. 2009;11(4):681-7.
5. Korbes D, Silveira A, Hyppolito M, Munaro G. Alterações no sistema vestibulococlear decorrentes da exposição ao agrotóxico: revisão de literatura. Rev Soc BrasFonoaudiol.2010;15(1):146-52.
6. Fonseca MGU, Peres F, Firmo JOA, Uchôa E. Percepção de risco: maneiras de pensar e agir no manejo de agrotóxicos. Ciênc Saúde Coletiva. 2007;12(1):39-50.
7. Porto MF, Soares WL. Modelo de desenvolvimento, agrotóxicos e saúde: um panorama da realidade agrícola brasileira e propostas para uma agenda de pesquisa inovadora. Rev. Bras. Saúde Ocup. 2012;37(125):17-31.
8. Kos MI, Hoshino AC, Asmus CIF, Mendonça R, Meyer A. Efeitos da exposição a agrotóxicos sobre o sistema auditivo periférico e central: uma revisão sistemática. Cad Saúde Pública. 2013;29(8):1491-506.
9. Korbes D, Silveira AF, Hyppolito MA, Munaro. Ototoxicidade por organofosforados: descrição dos aspectos ultraestruturais do sistema vestibulococlear de cobaias. Braz J Otorhinolaryngol. 2010;76(2):238-44.
10. Recena MCP, Caldas ED. Percepção de risco, atitudes e práticas no uso de agrotóxicos entre agricultores de Culturama, MS. Rev Saúde Pública. 2008;42(2):294-301.
11. Manjabosco C, Morata T, Marques J. Perfil Audiométrico de trabalhadores agrícolas. Arq. Otorrinolaringol. 2004;8(4):285-95.
12. Hirt MC. Caracterização dos Pacientes com Câncer de Cabeça e Pescoço Atendidos no Município de Irati nos Anos de 2005 e 2006.[Trabalho de Conclusão de Curso].Irati (PR): Universidade Estadual do Centro-Oeste; 2007.
13. Penteado RZ, Servilha EAM. Fonoaudiologia em saúde pública/coletiva: compreendendo prevenção e o paradigma da promoção da saúde. Dist Comun. 2004;16(1):107-16.
14. Teixeira CF, Brandão MFA. Efeitos dos agrotóxicos no sistema auditivo dos trabalhadores rurais. Cad Inf Prev Acid. 1998;19:218.
15. Levigar YE, Rozemberg B. A interpretação dos profissionais de saúde acerca das queixas de "nervos" no meio rural: uma aproximação ao problema das intoxicação por agrotóxico. Cad Saúde Pública. 2004;20(6):1515-24.
16. Souza A, Medeiros AR, Souza AC, Wink M, Siqueira IR, Ferreira MBC et al. Avaliação do impacto da exposição a agrotóxicos sobre a saúde de população rural. Vale do Taquari (RS, Brasil). Ciênc Saúde Coletiva. 2011;16(8):3519-28.
17. Kós MI, Miranda MF, Guimarães RM, Meyer A. Avaliação do sistema auditivo em agricultores expostos à agrotóxicos. Rev CEFAC. 2014;16(3):941-8.
18. Faria NMX, Facchini LA, Fassa AG, Tomasi E. Trabalho rural e intoxicações por agrotóxicos. Cad Saúde Pública. 2004;20(5):1298-308.
19. Soares W, Almeida RMVR, Moro S. Trabalho rural e fatores de risco associados ao regime de uso de agrotóxico em Minas Gerais, Brasil. Cad Saúde Pública. 2003;19(4):1117-27.
20. Faria NMX, Fassa AG, Facchini LA. Intoxicação por agrotóxicos no Brasil: os sistemas oficiais de informação e desafios para realização de estudos epidemiológicos. Ciênc. Saúde Colet. 2007; 12(1): 25-38.
21. Bedor CNG, Ramos LO, Pereira PJ, Rêgo MAV, Pavão AC, Augusto LGS. Vulnerabilidades e situações de riscos relacionados ao uso de agrotóxicos na fruticultura irrigada. Rev. Bras. Epidemiol. 2009; 12(1): 39-49.
22. Wilson JS, Otsuki T. To spray or not to spray: pesticides, banana exports, and food safety. Food Policy 2004; 29: 131-46.
23. Alves SMF, Fernandes PM, Marin JOB. Condições de trabalho associadas ao uso de agrotóxicos na cultura de tomate de mesa em Goiás. Ciênc. e Agrotecnol.2008;32(6):1737-42.
24. Delgado IF, Paumgartten FJR. Intoxicações e uso de pesticidas por agricultores do Município de Paty do Alferes, Rio de Janeiro, Brasil. Cad Saude Publica. 2004;20(1):180-6.
25. Foltz L, Soares CD, Reichembach MAK. Perfil audiológico de pilotos agrícolas. Arquivos Int. Otorrinolaringol. 2010;14(3):322-30.
26. Fernandes BJ, Mota BH. Estudo dos limiares de audibilidade nas altas frequências em trabalhadores expostos a ruídos e solventes. Pró-Fono R Atual Cient. 2001;13(1):1-8.

27. Faria NMX, Rosa JAR, Facchini LA. Intoxicação por agrotóxicos entre trabalhadores rurais de fruticultura, Bento Gonçalves, RS. Rev Saúde Publica. 2009;43(2):335-44.
28. Veiga MM, Silva DM, Veiga LBE, Faria MVC. Análise da contaminação dos sistemas hídricos por agrotóxicos numa pequena comunidade rural do Sudeste do Brasil. Cad. Saúde Públic. 2006;22(11):2391-99.
29. Garcia EG, Bussacos MA, Fischer FM. Impacto da legislação no registro de agrotóxicos de maior toxicidade no Brasil. Rev Saúde Publica. 2005;39(5):832-9.