An assessment of occupational health risks in female hairdressers forefront to xenobiotics

Um levantamento de riscos na saúde ocupacional de cabeleireiras frente à xenobióticos

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RESUMO

Cabeleireiro é uma categoria profissional que trabalha com o cabelo humano, realizando diversas alterações ao mesmo como corte ou coloração, tendo expressiva participação feminina nos salões de beleza. Suas ações, com a aplicação de produtos contendo formulações químicas, as expõem, gerando riscos potenciais para saúde. Este estudo tem como objetivo investigar os problemas de saúde vividos por este grupo funcional, evidenciando os acometimentos na saúde. Dessa forma, uma avaliação exploratória foi conduzida para investigar a prevalência de problemas de saúde destes profissionais, assim como suas percepções de saúde. A investigação foi feita em 30 salões de beleza, situados em Jacarepaguá, Rio de Janeiro. Verificou-se as fragilidades na saúde de forma generalizada em todas as faixas etárias, expressando, dentre outras, doenças respiratórias e reprodutivas. Também foi observada uma alta prevalência de tabagistas, o não-uso de equipamentos de proteção individual na realização do trabalho, inclusive na manipulação de uma gama de produtos químicos. A pesquisa demonstra a urgência de orientações a este grupo funcional sobre os riscos no ambiente de trabalho, bem como que os procedimentos utilizados ocupacionalmente se dão de forma rotineira e igualitária nos salões de beleza.

Palavras-chave: cabeleireiros, saúde ocupacional, químicos

ABSTRACT

Hairdressing is a professional category working with human hair, making several changes at the same as cutting or coloring, with significant participation of women in beauty salons. Their actions, with the application of products containing chemical formulations, expose them, creating potential risks to health. This study aims to investigate the health problems experienced by this functional group, showing onsets of health. Thus, an exploratory was conducted to investigate the prevalence of health problems on these professionals, as well as their perceptions of health. The investigation was conducted in 30 salons, located in Jacarepaguá, Rio de Janeiro. There was weakness in health across the board in all age groups, expressing, among others, respiratory and reproductive sickness. It was also observed a high prevalence of smokers, non-use of protective equipment in performing the work, including the handling of a range of chemicals. The research demonstrates the urgent need for guidance in this functional group on the risks in the workplace, as well as the procedures used occupationally occur routinely and equal in beauty salons.

Keywords: hairdressers; occupational health, chemicals

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INTRODUCTION

Through history and across cultures, women as well as men have felt the requisite to change the natural colour of their skin, lips and hair, or to re-establish the colour of greying hair (Orton & Basketter, 2012). For thousands of years, cosmetic dyes have been a part of all human cultures (Draelos, 2012).

The work environment for hairdressers includes a range of potential hazards, some which are easily observed, and others that are more insidious (Galiotte et al., 2008; Ronda et al., 2009). These professionals are exposed to numerous of chemicals contained in colorants, bleaches, shampoos and hair conditioners. Furthermore, hairdressers may be exposed to volatile solvents, propellants and aerosols from hair sprays as well as to formaldehyde, methacrylates and nitrosamines contained in many hair care products (Golka et al., 2004; Takkouche et al., 2009).

Hairdressers might be exposed to a range of chemicals in their work environment, often without adequate ventilation, or the use of personal protective equipment (Wenzel et al., 2010). Many hairdressing establishments are single traders, with few employees, which can promote an environment in which there is limited support for workers to accomplish their own health in the workplace.

There is a range of potential health hazards in hairdresser occupational environment, including biological, chemical, physical and ergonomic factors. Relations of hairdressers and customers are developing psycho emotional stress. The hairdressers are contacting with different chemicals (hair dyes, bleaching agents, permanent waves solutions, hair conditioners, hair spray and perfumes (Ronda et al., 2009). Effects of hairdresser's exposure to chemicals often incorporate a wide range of products, over widely varying time periods (Lysdal et al., 2012; Nemer et al., 2013). This makes exposure measurement for occupational groups such as hairdressing very challenging. Hairdressers are potentially exposed to a range of hazards in their work environment (Bradshaw et al., 2011; Nemer et al., 2013).

The main system reason for measuring quality of life (QoL) and Health-related quality of life (HRQoL) is to evaluate the outcome of health interventions (Gill & Feinstein, 1994). QoL and HRQoL can be used to compare the effect of health interventions or evaluate new drugs (Jaeschke et al., 1992). The final purpose of HRQoL and QoL is in monitoring the health of populations, to examine risk factors and subsequent health (Cox et al., 1992), providing the health system with information on which to develop population based intervention programs.

Significant increased risks for hairdressers have become evident due to health problems related to this group (Pukkala et al., 1992; Wenzel et al., 2010; Orton & Basketter, 2012). This way, there is a need for an occupation specific examination of health concerns for hairdressers. Hairdressing work is characterised by a range of intermittent tasks. Contact to chemical products is frequently for a short duration, but is consistently recurrent (Pukkala et al., 1992; Galiotte et al., 2008). This makes a difficulty when attempting to define the exposure levels of chemical products for hairdressers. For salon supplies used for hair bleaching contain perisulphate salts, ethanol and ammonia (Figueiredo et al., 2008), and these compounds have been directly linked to both asthma and contact dermatitis in several international studies of hairdresser groups (Gala et al., 2001; Muñoz et al., 2004), demonstrating that there is a longer than expected latency period for exposure to these chemicals and the occurrence of asthma symptom onset. This retardation in sensitization has been recognized to hairdresser's shorter but frequent regular exposure were found in most of air samples.

The difficulty of evaluating exposure ranks in a range of chemical products has discouraged research into potential health effects of airborne exposure in hair salons. The professional activity in a hairdressing salon exposes hairdressers to a range of known airway irritants (Makinen, 2002; Herin et al., 2012). Potential respiratory health consequences include an improved prevalence of asthma, allergy, chronic bronchitis, and other respiratory illnesses (Muñoz et al., 2004; Figueiredo et al., 2008). Older aged hairdressers, over 50 years, are at an increased risk of respiratory illness than younger ones. Satisfactory ventilation in the workplace is indispensable when working with chemicals, and the small workplace environment of a hairdressing salon has the potential to provided poor ventilation when using chemical materials. Comprehensive investigation into the wide range of potential chemical health hazards in the hairdressing workplace is outside the scope of this research.

MATERIALS and METHODS

Study site

Jacarepaguá with a land area of 29.27 square miles (75.8km^2) is the 4th largest neighbourhood in the city of Rio de Janeiro, Brazil. In 2010, it had a population of 100,822, making it the 9th most populous neighbourhood in the city (IBGE, 2010). The name comes from the indigenous name of the location, *shallow pond of alligators*, by the time of the Portuguese invasion. Is located in the West Zone of Rio in the Baixada de Jacarepaguá, between Maciço da Tijuca and the Serra da Pedra Branca (22°56'55"S - 43°20'38"W). The upper middle class Barra da Tijuca separates the suburb from the sea. Is divided into the following sub-areas: Anil, Curicica, Cidade de Deus, Freguesia, Gardênia Azul, Pechincha, Praça Seca, Rio das Pedras, Tanque, Taquara and Vila Valqueire. The quarter of Freguesia, is part of the suburb Jacarepaguá in the West Zone of the city of Rio de Janeiro, Brazil. In 2010 its estimated population was 54,010 inhabitants ((IBGE, 2010) (Figure 1).

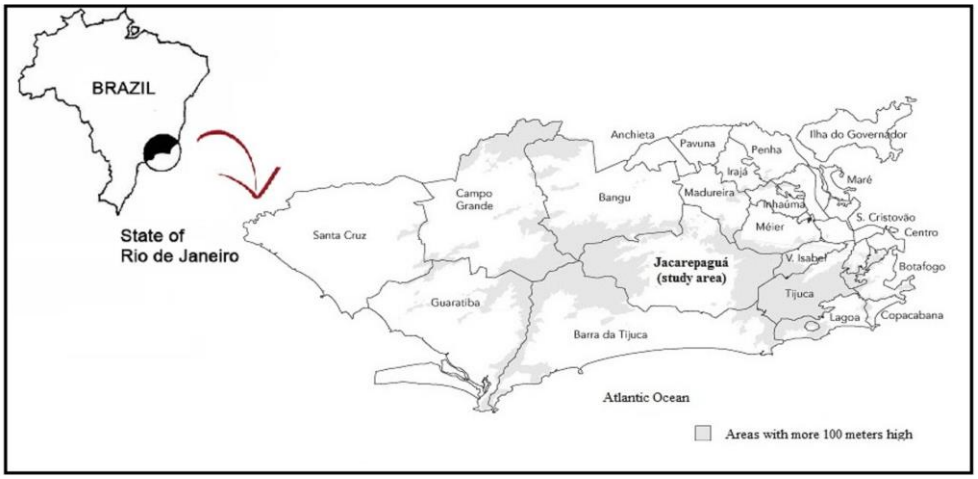

Figure 1. Study area: Localization of Jacarepaguá, State of Rio de Janeiro, Brazil

Study population

A total of 106 females employed in 30 beauty institutes on the district of Jacarepaguá, were included in this study (Figure 2). All subjects were aware of the objectives of the study and gave informed consent to participate. This study received approval from the Bioethics Committee (0054.0.031.000-06) (National School of Public Health Sérgio Arouca/Ensp/Fiocruz).

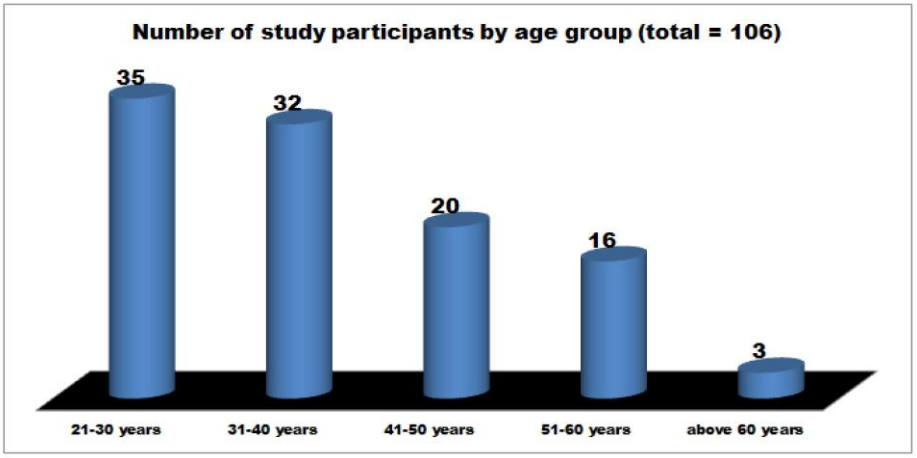

Figure 2. Hairdresser cohort by age group

Beauty institutes

Although not officially designated, Brazilian beauty institutes are 'classified' as categories A, B and C, according to the number of employees, size of the establishment, location, type of beauty products in use and offered services. In this investigation all institutional categories of were included.

Questionnaire and sample collection

The interview included questions including age, number of hours worked per week, the risk factors at work, self-appraisal of health, occupational status, years of employment, alcohol and tobacco consumption, personal use of hair dyes, diet, reproductive history, air exposure and self-perception of health were collected using a standard questionnaire done work (Asamugha & Ferguson, 2004). HRQoL has been introduced late in occupational medical research compared to care health research in general. HRQoL and working life are linked and must be of concern to occupational health researchers (Blank, 2004). The final purpose of HRQoL is in evaluating the health of populations, to examine risk factors and subsequent health, providing the health system with information on which to develop population based intervention programs.

Questionnaire was designed after review of the literature (Cox et al., 1992; Gill & Feinstein, 1994; De Smedt et al., 2012; Salah et al., 2012), observations in several hairdressing salons and local visits, therefore was validated for application. A pilot study was undertaken during 2010-2011 to check suitability of the questions for the study population.

Achievement data on hairdressers' occupational activities

The obtaining data on hairdressers' occupational activities was planned, implemented and evaluated according to the model described by Goldenhar et al. (2001) (Figure 3). Groups in three phases for evaluation process in occupational safety and health: development, implementation and effect evaluation. Each phase consists of five central tasks: gathering background information; developing partnership; choosing methods and design; completing development, implementation and evaluation; and reporting and disseminating the process and results. The process described encourages going a step backwards whenever the five tasks in each phase have been completed in order to evaluate and improve the development, implementation and occupational evaluation.

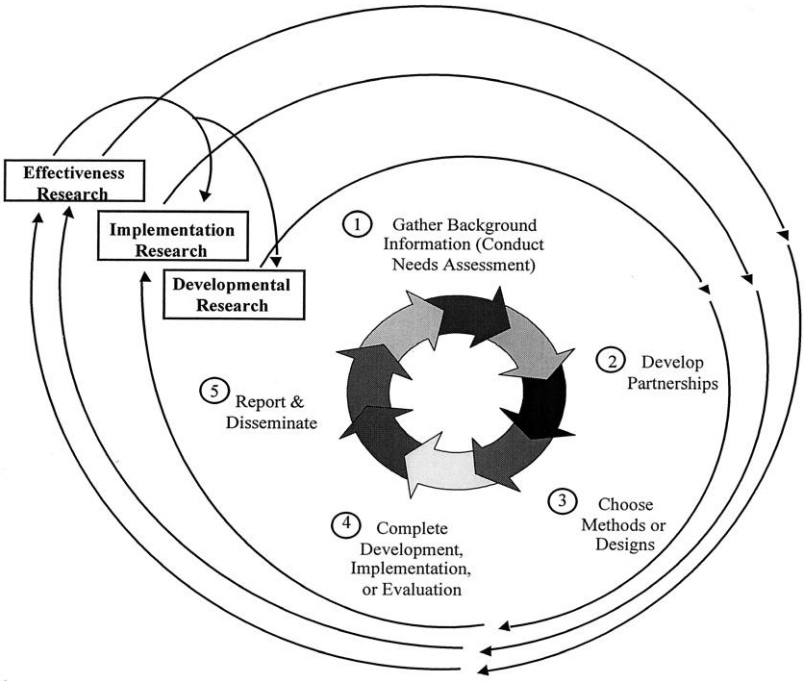

Figure 3. A conceptual model for hairdressers' occupational evaluation (Goldenhar et al. 2001)

Self-perceptions of health

The present study was designed to extend this research by examining the self-perceptions of health. Data from patients' self-report questionnaires provide valuable information about the side-effects that patients may view as having a significantly detrimental impact on their QoL (Fujimura et al. 2011). The hairdressers were enquired to respond to the question "would you say your health is: excellent; very good; good fair; or poor".

Statistical analysis

The statistical analyses were performed using the Origin 8.0 (OringinLab). The mean and dispersion of the data were calculated, and the results were compared to linear generalized models assuming a Gaussian distribution. To assess the independent statistical relationships of all relevant variables simultaneously, a multiple regression analysis was used. The tests were interpreted using a 5% degree of significance.

RESULTS

Hairdresser Profile

The study participants consisted of a group of 106 female hairdressers divided into the age-specific cohorts, there were 35 (21-30 years) (mean= 25.42; sd=3.13693); 32 (31-40 years) (mean= 35.56; sd=3.14117); 20 (41-50 years) (mean= 44.9; sd=2.9718); 16 (51-60 years) (mean= 55.62; sd=3.11716); and 3 (above 61 years) (mean= 63; sd=2). The majority reported living on the district of Jacarepaguá, Rio de Janeiro (n=73, 68.9%), and 31.1% (n=33) living in other neighbourhoods. A large proportion of the group had worked as a hairdresser for over 16 years (n=83, 78.5%). The most of hairdressers were full time workers (n=94, 88.7%) with 70 of these workers informing that they worked more than 40 hours per week. Moreover, 22.6% (n=24) reported that they rarely had sufficient time for a meal break when working, and a supplementary 8.5% (n=9) reported never or rarely having time for a toilet break at work. The majority of hairdressers, however, continue to work with chemically based dyes (n=103, 97.2%). Concern about the effect of chemical exposure has impelled some hairdressers to use organic based products. In this study, a small proportion of hairdressers reported using organic dyes exclusively in the workplace (n=3, 2.8%).

Self-perceptions of health

The majority of the hairdressers in the study affirmed themselves to be in excellent or in very good health (n=83, 78.3%). A further 16% professed their own health as good (n=17), while 5.7% informed their health as fair or poor (n=6) (Figure 4). The results for this self-perception of health showed that for the younger age range 21-40 years, most hairdressers reported being in excellent or very good health and fewer number of hairdressers reported being in fair or poor health. For the mid aged group 41-60 years, and older age range above 60 years reported being in good health when compared to the general population. The differences in the hairdresser group and the general population group for the younger aged was statistically significant (p-value < .05). For the mid aged group, the difference between the hairdresser and the general population group was not statistically significant.

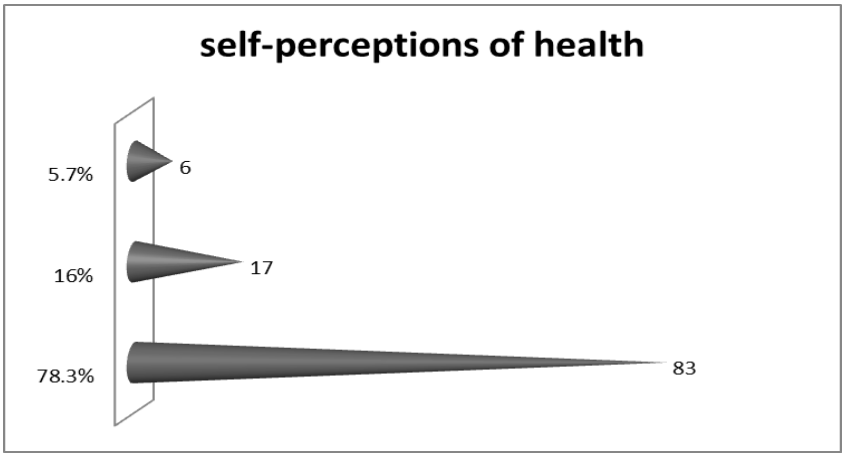

Figure 4. Hairdressers' perception of their own health

Smoking

The hairdressers reported smoking daily (n=60; 56.6%), with a further 22.6% (n=24) smoking, but less than daily, giving a total current smoking frequency of 79.2% (n=84). This high prevalence of smoking is consistent with international studies on hairdresser groups (Guida et al., 2011; Letasiova et al., 2012).

Within the hairdresser age cohorts, the 21-30 years had the highest proportion of daily smokers (n=35; 33.01%). Additionally, more than half of the hairdresser cohort reported that they were either currently or previously, a daily smoker (n=73, 68.86%).

Reproductive Outcomes/fertility

Many reproductive outcomes, such as still births and spontaneous abortion, are rare events in the general population (Rylander et al., 2002; Baste et al., 2008). The uncommon prevalence of these events, in combination with a consideration of the ethics of investigating what can be a traumatic life event, has deterred investigation into a wider range of reproductive outcomes for the hairdresser cohort. The area relating to reproductive outcomes examined in this study is fertility.

The sample analysed, 45.3% of hairdressers are new mothers (n=48), 2% were pregnant at the time of the survey (n=2), 18.9% had tried unsuccessfully for over twelve months to get pregnant (n=20). However, in the hairdresser group, 32.1% (n=34) had never tried to get pregnant. When hairdressers who had never tried to get pregnant were removed from the total group, 7.7% (n=4) of the remaining 52 hairdressers reported being unsuccessful in trying to get pregnant for a period greater than twelve months.

Respiratory Health

A large proportion of the hairdresser group reported experiencing allergies, hay fever and sinusitis (n=76; 71.7%). Airway irritants which promote allergy, sinusitis and hay fever may also contribute to an increase in headaches and migraines. Headaches and/or migraines were experienced by 83% (n=88) of hairdressers with 14.1% (n=15) of hairdressers reporting that they experience headaches and/or migraines sometimes or often.

DISCUSSION

The present report aims to evaluate health problems in hairdressers associated with workplace exposure to xenobiotic substances. There were distinct variations in how hairdressers perceive their own health in this study. Younger and mid aged hairdressers perceived themselves to be in better health. However, the majority of older hairdressers considered themselves to be in poorer health. These results are consistent throughout many of the common health problems individually examined in this study. In occupational groups that are affected by chronic health conditions, the impact of the healthy worker

effect changes over time (Baillargeon, 2001). As the population ages, the remaining workforce is likely to be healthier than the general population of the same age range (Hashemi et al., 2010).

The hairdressing culture of a customer focussed workplace environment is integral to the running of a successful hair salon, but the needs of customers need to be balanced with an understanding that a healthy employee provides the best service. An understanding of the impact of repetitive and awkward movement and positioning needs to be promoted in the work environment.

The great prevalence of smoking in the hairdresser group may also have led to a reporting predisposition (Gallicchio & Flaws, 2009). This kind of bias happens when applicants are hesitant to report an exposure he is aware of because of attitudes, beliefs, and perceptions. Hairdressers who are smokers may have underreported the outcome of respiratory concerns, such as breathing difficulties, due to the perception of smoking being an indicator of poor health (Albin et al., 2002). The impact on respiratory health is well documented and hairdressers who smoke are at risk of a range of cancers and other health issues (Ros et al., 2012).

Consideration must be given to those hairdressers who due to the impact of health concerns are no longer working in this occupation. When workers remove themselves from an occupation due to poor health, the population that remains working tends to be healthier. This is a phenomenon known as the healthy worker effect in epidemiological studies (Nishikitani et al., 2012). Studies of workplace risks that have non-fatal health outcomes, such as asthma, are particularly likely to be effected by this bias as workers leave the occupation and transfer to a less-exposed environment (Farrow & Reynolds, 2012).

Older age hairdressers have demonstrated a statistically significant increase in allergies, hay fever, sinusitis, headaches and migraines in this study. This is consistent with other studies, which have identified that older hairdressers are at an increased risk of respiratory illness than younger workers.

This study of common health problems of female hairdressers indicates that occupied as a hairdresser may deleteriously affect health. But, any understanding of this study's results must be examined with situation to the restrictions of this study proposal.

CONCLUSION

Hairdressers simultaneously are exposed to different chemical agents. Chemical factor is one of the most important health risk factors for hairdressers. The health data observed could be associated with the hairdressers' occupational environment, where different chemicals are chronically manipulated and inhaled. Considering that this profession in many countries, including Brazil, is not officially regulated, more attention should focus on these professionals not only by legislative bodies but also by multidisciplinary teams able to develop and implement risk prevention and control strategies for chemical, physical and biological agents to which hairdressers are exposed. Frequency of health complains on irritation correlate with level of chemicals concentration in work environment. The efficiency of the ventilation has to be improved in the most of work places of hairdressers to diminish health risk. Improvement of the ventilation system in the hairdresser salons and implementation of hygiene measures aimed at mitigating exposure to potential carcinogens at work may reduce the risk.

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