

Adherence and knowledge about the use of personal protective equipment among manicurists

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ABSTRACT

Objective: this study aimed to assess adherence and knowledge of manicures/pedicures on the use of Personal Protective Equipment (PPE). **Method:** it was a survey with 235 manicures/pedicures in salons, Belo Horizonte/Brazil. Data were analyzed with the software Statistical package for the social sciences (17.0), using descriptive statistics, chi-square and logistic regression. **Results:** the adherence and the knowledge of the professional were evaluated using the median of the results, obtaining 52% and 63% respectively. The professionals younger than 31 were more likely (2.54 times) to adhere to PPE and those who claimed to have done biosafety course and to use uniform during work, had better chance of understanding (2.86 and 3.12 times, respectively). The majority (83.4 %) stated that the use of PPE should occur for all procedures, meanwhile 71.5 % cited not use them. **Conclusion:** the results indicate the poor adherence to PPE, strengthen occupational biological risk and need for training of these professionals.

Key words: Beauty and Aesthetics Centers; Podiatry; Exposure to Biological Agents; Universal Precautions.

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INTRODUCTION

When professionals in the aesthetic and beauty industry do not know and/or do not adhere to security best practices, they increase their chances of being exposed to microorganisms by direct or indirect contact, through skin mucosa, dermal or percutaneous, for instance when the skin suffers abrasions, desquamation, perforations and ocular mucosa affected by nail fragments⁽¹⁾.

The service offered by manicurists has a high social impact, given its demand for the population regardless of gender or age⁽²⁾. However, when caring for nails, accidents with sharpened tools are common to occur, reaching the vascular bed during the removal of the eponychium (cuticle) with pliers may lead to transmission of bloodborne pathogens such as hepatitis B virus (HBV), C virus (HCV) and HIV⁽³⁾.

Microbial cross-transmission can occur between clients, among professionals, from clients to professional and vice versa. In order to minimize contact and expose to biological material and protect professionals and clients, the Centers for Disease Control and Prevention (CDC) proposed a guide with recommendations to be adopted in the care of any patient, regardless of their diagnosis, being called Standard Precautions (SP). These were maintained and reinforced in the guide review, in 2007, reclaimed in Brazil by the Health Surveillance Agency⁽⁴⁾. Among the recommended precaution measures, hand hygiene, the use of Personal Protective Equipment (PPE), vaccination against hepatitis B and proper disposal of sharps were included⁽⁴⁾.

The lack of adherence to precaution measures by professionals may result in exposure to biological material, increasing the chances of contamination by potentially microorganisms causing infections, which consequently causes adverse health effects, as well as associated costs and social costs.

Adherence to PPE by aesthetic and beauty professionals depends on the knowledge of those involved (employers, employees and clients) about the importance of their use, but also the supply and availability of PPE, which are determined by law to any employer or independent establishment of the activity area⁽⁵⁾.

The lack of research on the safety and occupational risks related to exposure to biological material in the aesthetic and beauty industry brought concerns that led to the proposition of this study, which aimed to assess adherence and knowledge of manicurists, working in beauty salons, about their personal protective equipment.

METHODS

This is a survey (based on direct questioning of people whose behaviors/knowledge are related to the problem to be investigated)⁽⁶⁾ performed with manicurists, conducted from June 2012 to March 2013 in beauty salons in Belo Horizonte, Minas Gerais State, after approval by the Research Ethics Committee of the Universidade Federal de Minas Gerais (CAAE - 0195.0.203.000-11). One technician was interviewed by salon in a sample of 235 establishments, calculated with 95% confidence interval, standard deviation of 0.5 and maximum

estimated error of 0.05 from a population of 600 beauty salons, with registration and authorization provided by the City Assistant Secretary for Urban Regulation of city Hall in 2010.

Each salon was chosen from a simple random selection among the 600 registered. We mapped the aesthetic and beauty salons by neighborhoods to obtain a sample geographically distributed in all regions of the city censused in 2010, 2.475 million⁽⁷⁾. In order to confirm their existence and addresses, phone calls were made to all establishments.

Five interviewers were properly trained and the visit plan with the addresses of drafted establishments was handed in for them. In case of refusal of any salon or if it was found closed or not located where it was supposed to be, we used the replacement criterion of next establishment located on the left, as long as the establishment had registration with the city of Belo Horizonte.

As criteria for the participation of the manicurist in the research, we established we would interview those with at least one year of experience in this profession, aged above 18 years, regardless of gender, owner or employee of the salon. In case of one or more professionals interested to participate, the participant's definition was performed by choosing the date of birth that was closest to the date of visit. The interviews occurred after the verbal invitation to the owners and professionals of establishments, explaining the objectives and relevance of the research. After the acceptance, the Consent Form was presented to professionals.

For the interview, we adopted a structured questionnaire containing multiple choices and open questions divided into five parts: I- sociodemographic characteristics of manicurists; II and III- aspects related to knowledge and adherence to PPE use; IV- factors that hinder the adherence to PPE by technicians. The questionnaire was previously validated by four researchers with knowledge and training in statistics, epidemiology, infectious diseases and infection control.

The answers of the open questions were categorized and analyzed. The multiple choice items were analyzed in the Statistical Package for the Social Sciences (SPSS/pc) version 17.0 using descriptive statistics, chi-square or Fisher's exact test.

The multivariate binary logistic regression was used to analyze the influence of sociodemographic variables with $p \leq 0.20$ considered potential factors associated with adherence and knowledge of personal protective equipment.

RESULTS

Out of the 600 registered salons, 235 were selected, among which 102 agreed to participate, 31 refused and the others were not at the informed address. Then, we proceeded to the substitution of the 133 other salons as previously defined criteria, totaling 235 salons at the end. The distribution of the visited salons was proportional by regions of the city.

In 32 salons, more than one manicurist showed interest in participating, adopting thus the date of birth that came closest to the day of the visit to choose the participant.

A total of 235 manicurists responded to the questionnaire, all female, aged between 18 and 69 years (mean 32.6 years). Other demographic data are shown in the Table 1.

Table 1- Sociodemographic profile of manicurists interviewed. Belo Horizonte. 2013

Sociodemographic variables	Total = 235		Sociodemographic variables	Total = 235	
	N	%		n	%
Gender			Works for another salon		
Female	235	100	Yes	4	1.7
			No	231	98.3
Age group			Workload/ day		
≤ 31 years	119	50.6	≤ 6 hours	21	8.9
> 31 years	116	49.4	8 hours	122	52.0
			> 8 hours	92	39.0
Marital status			Professional training		
Single	108	46.0	Not regular/informal	155	66.0
Married or with partner	107	45.5	Professionalizing course	80	34.0
Other (divorced.widow)	20	8.5			
Education			Other training courses		
Incomplete primary education	22	9.4	Yes	124	52.8
Complete primary education	44	18.7	No	111	47.2
Incomplete secondary education	36	15.3	Biosafety course		
Complete secondary education	125	53.2	Yes	65	27.7
Higher education	8	3.4	No	170	72.3
Number of children			Responsible for family income		
None	84	35.7	Yes	89	37.9
One	60	25.5	No	146	62.1
Two	55	23.4			
≥ Three	36	15.3			
Working time in the field			Insertion in class association		
≤ 10 years	139	59.1	Yes	3	1.3
> 10 years	96	40.9	No	232	98.7
Working time in the visited salon			Participation in the establishment		
≤ 2 years	138	58.7	Informal work	178	75.7
> 2 years	97	41.3	Formal work	27	11.5
			Partner	18	7.7
			Owner	12	5.1

Regular Professionalizing course = education in schools regulated by the guidelines of the Ministry of Education. completed with diploma/certificate. Not regular course = self-taught. training and insertion into service without appropriate training. Training courses = nail decoration. porcelain nails. makeup technique. hair-styles. Biosafety course = any course or training that may have been offered in the workplace. during professionalizing course. events/fairs. Formal employment = registered with employment contract. Informal employment = service without an employment contract/bond.

In the evaluation of all questions for consideration of adherence and knowledge about Personal Protective Equipment (type and switch period of PPE, simple hand hygiene before/after use of gloves, clothing, use of coat/apron, clothing processing, closed shoes) the mean, median and minimum proportion of correct answers on the questions related to knowledge, were higher compared to adherence. The median for

adherence was 52% and 63% for knowledge. The correct rate in different topics surveyed varied greatly from 7.7% to 90% for adherence and from 25% to 87.5% for knowledge.

Table 2 presents the results of the bivariate analysis between sociodemographic variables and the variables adherence and knowledge of PPE among manicurists. The data are considering the percentage of success defined by the median.

Table 2 - Distribution of sociodemographic variables regarding adherence and knowledge of Personal Protective Equipment among manicurists (N= 235), categorized by the median of knowledge regarding the questions, Belo Horizonte, 2013

Variables	N	Adherence (Proportion of correct answers > 52%)			Knowledge (Proportion of correct answers > 63%)		
		Correct	%	p-value	Correct	%	p-value
Age group (median)							
≤ 31 years	119	65	54.6	< 0.01	50	42.0	0.17
> 31 years	116	43	37.1		59	50.9	
Marital status							
Married or with partner	107	49	45.8	0.92	45	42.1	0.47
Single	108	49	45.4		54	50.0	
Others	20	10	50.0		10	50.0	
Education							
Incomplete primary education	22	12	54.5	0.49	14	63.6	0.51
Complete primary education	44	17	38.6		21	47.7	
Incomplete secondary education	36	14	38.9		16	44.4	
Complete secondary education	125	60	48.0		54	43.2	
Higher education	8	5	62.5		4	50.0	
Number of children							
None	84	42	50.0	0.08	35	41.7	0.36
One	60	22	36.7		33	55.0	
Two	55	22	40.0		23	41.8	
≥ Three	36	22	61.1		18	50.0	
Work experience							
< 10 years	139	70	50.4	0.10	60	43.2	0.23
> 10 years	96	38	39.6		49	51.0	
Working time at the salon							
< 2 years	138	97	70.3	0.34	63	45.7	0.78
> 2 years	97	41	42.3		46	47.4	
Workload							
≤ 6 hours	21	7	33.3	0.43	10	47.6	0.61
8 hours	122	56	45.9		60	49.2	
> 8 hours	92	45	48.9		39	42.4	
Professional training							
Not regular/informal	155	77	49.7	0.11	75	48.4	0.39
Profissionalizing course	80	31	38.8		34	42.5	
Other training							
Yes	124	56	45.2	0.79	44	35.5	< 0.01
No	111	52	46.8		65	58.6	
Biosafety course							
Yes	65	39	60.0	0.05	42	64.6	< 0.01
No	170	78	45.9		62	36.5	
Responsible for family income							
Yes	89	38	42.7	0.43	40	44.9	0.73
No	146	70	47.9		69	47.3	
Participation in the establishment							
Informal employee	178	87	48.9	0.43	82	46.1	0.45
Formal employee	27	10	37.0		10	37.0	
Partner	18	6	33.3		11	61.1	
Owner	12	5	41.7		6	50.0	
Work accidents							
Yes	158	78	49.4	0.13	67	42.4	0.08
No	77	30	39.0		42	54.5	

the adherence variables: age group and biosafety course and for knowledge, we highlight other training courses and similarly adherence was also associated with conducting biosafety courses. Manicurists aged under 31 years had greater adherence to the use of PPE (54.6%) even though without much reflection for knowledge ($p < 0.05$). Manicurists who claimed to have training in various courses had worse results in adherence questions (46.8%) and knowledge (58.6% - $p < 0.05$). On the other hand, those that revealed that they had done a biosafety course showed greater adherence and knowledge on PPE questions (60% and 64.6% respectively - $p < 0.05$).

The results of multivariate binary logistic for adherence and knowledge of PPE in relation to sociodemographic variables revealed that younger professionals (≤ 31 years) were more likely (2.54 times) to adherence. Those who said they had taken biosafety courses and reported wearing uniform at work had a greater chance (3.12 and 2.86 times, respectively) of knowledge about PPE (Table 3).

Each of the components of personal protective equipment was detailed as showed below.

Most participants (71.5%) said they did not use PPE while attending clients. The use of gloves was reported by 26.4% of participants, the mask by 13.2%, the cap by only 3.4% and goggles were reported by 3%. Situations indicated for adherence were considered for all kinds of offered services (16.2%), after a procedure that generated bleeding or when it is known that the client has a disease (7.6%), without much criterion (3.8 %) and when a client requests for them (4.7%).

Re-usage of gloves was reported by only 2.6% of manicurists, other participants said they discarded them for every client. Regarding masks, 12.3% among the manicurists (31) who said they used them to cover their mouth and nose, with 9% discarding PPE daily or for every client and 4.3% without criterion.

With regard to knowledge about the use of PPE, 83.4% said it should be used for all procedures, 7.2% reported that the frequency of use would depend on the experience of the professional, and to 3.8% the change is indicated only after a procedure that generated bleeding and 5.6% reported this is

not necessary or they did not know how or when to use them. The majority (91.5%) answered correctly about the need to discard the gloves between clients, but 8.5% indicated that they could be reused as long as there was little dirty or until they showed tears. In addition to the use of gloves, the majority (83.8%) considered ideal washing their hands before and after use, 13.6% before or after and 2.6% identified the use of gloves as a substitute for hand hygiene (HH).

Regarding the mask, most answered correctly on PPE, saying it should cover the mouth and nose, but 10.2% claimed that the nose can be uncovered. For the goggles, knowledge was also adequate with 76.2% of participants determining the specific type of goggles with side shields, 8.1% indicated that goggles of any type could be used, 6.4% the ones for visual correction and 9.4% could not answer this question.

As regards for reasons for not using PPE by the interviewed manicurists, the main reason was feeling uncomfortable and discomfort during use (38.3%), followed by allergy 25.1%, judgment that the activity they perform did not expose them to blood and wounds (10.6%), or because they were working in the field for a long time and had never had accidents (5.1%). Still others pointed out that they did not know if there was a need for usage (4.3%), also that it could produce customer discomfort (3.8%), some said PPE had a high cost (3.4%), or that the salon did not provide PPE (1.7 %) and (7.7%) reported they would always use PPE.

We also analyzed the type of clothing, the use of accessories and, although the majority (83.4%) have presented knowledge about this subject (determining uniform or unique clothing for work, protected by an apron, changed every day, and washed with bleach and separate, closed shoes, no exposure of the feet) this fact did not imply adherence to the same extent. Only 34% reported using closed shoes, 68.1% the use of uniform or apron over clothes, 37% said they removed all accessories at work and 63.4% have short length nails. Proper processing of clothes used in the salon, washing them separately from other clothes or the rest of the family itself was cited by 79.1% of manicurists.

Table 3 – Logistics regression model adjusted for dependent variable correct answers related to adherence and knowledge of the Personal Protective Equipment, Belo Horizonte, 2013

Variables	Adherence (Proportion of correct answers > 52%) OR (IC 95%)	p-value	Variables	Knowledge (Proportion of correct answers > 63%) OR (IC 95%)	p-value
Age group			Biosafety course		
> 31 anos	1		No	1	
≤ 31 anos	2.54 (1.33-4.84)	< 0.01	Yes	3.12 (0.16-0.65)	< 0.01
			Type of clothing		
			Common clothing	1	< 0.01
			Uniform	2.86 (1.32-6.19)	< 0.01
			Coat/apron Over clothing	0.55 (0.16-1.80)	0.32
			Uniform and coat/apron	0.21 (0.03-1.27)	0.09

DISCUSSION

The refusal rate among the visited beauty salons was 15.5% and this result is higher than results obtained in other studies in aesthetic and beauty salons with acceptance rating from 94% to 100%, but inferior to another study with participation rate of 60%^(3,8-10).

All of the participants were female, young with an average age of 32.6 years. This result corroborates a research that indicated this category as particularly exercised by professionals with this profile^(3,9-13). The work experience in the participant salons of this research was of only two years, indicating job rotation. This fact can be explained by the absence of employment contracts, as most of them reported not having a formal contract. The time exercising the profession as a manicurist was for 10 years (defined by the median), similar to other studies and higher compared to another study in which the author determined six years of experience^(1, 12-13).

In this study the knowledge of professionals about the importance and the correct use of PPE did not reflect to the same extent in practice, represented by low adherence to them. Only 26.4% of the participants mentioned the use of gloves, with reuse by 2.6%, with lower adherence to masks (13.2%) and goggles (3%). Gloves should be single used, they should be taken off and discarded after use, between clients, and, after using them, it is essential to avoid touching surfaces and other objects that are not part of direct client care⁽⁴⁾.

The data referring to PPE adherence of this study are consistent with three others that showed variations between 26% and 95% of non-adherence to procedure gloves for manicurists for customer service^(1,7,12). And in one of these studies it was reported that when there were blood contact between client and manicurist, it always happened (100%) without gloves and, most of them with positive serological marker for hepatitis B. Among those who said they wore gloves, 34% reported doing so to prevent diseases and 19% for own protection and the client. An important finding was the non-adherence to any other PPE such as masks, goggles and cap for all manicurists⁽¹⁾.

In a study conducted with hairdressers, the use of gloves was identified for 68%, however, 50.5% reused them, and for Barbers there were also records for low adherence to PPE, with the absence of gloves wear even when in contact with blood^(9,14).

Gloves require HH before wearing them and after removing them. In this study it was noticed satisfactory knowledge 83.8% on the HH associated with the use of gloves and adherence was higher after glove removal (21.3%) compared to HH before wearing them (16.2%). The use of gloves does not exclude mandatory HH knowing that they are porous and can have micro perforations allowing the exchange of substances between hand skin and external environment^(5,15).

The mandatory use of PPE is defined for all Brazilian workers by the standard regulatory NR6 of 1978⁽¹⁶⁾. And in the case of risk of contact with biological material, the use of PPE is a universal measure, not restricted to health professionals, but to all who have the possibility of contact with blood and other body fluids capable of microbial transmitting which includes manicurists. The use of gloves, preventing contact with blood, should occur for all situations in which there is no risk and after blood exposure has happened⁽⁴⁻⁵⁾.

With regard to clothing, what is usually wore in the health professional routine has been considered a potential reservoir and has been involved in microbial transmission even in a smaller proportion⁽¹⁷⁻¹⁸⁾. Despite the lack of studies on the clothing of beauty and aesthetics professionals, it can be inferred, as health professionals, they can be contaminated by microorganisms that can cause harm, especially when there is some immune imbalance. Therefore, some care must be taken with uniforms, aprons and coats, wearing them only at the salon, avoiding circulation with these in other environments outside the workplace. This clothing should be washed daily, as also recommended for health professionals, because the lower the frequency of this care, the greater the possibility of contamination and maintenance of micro-organisms on fabrics⁽¹⁷⁻¹⁸⁾.

When washing clothing domestically, it must be separated from other clothes and from the family clothes and hot iron must be used because microorganisms, especially fungi, can resist the simple washing process, but be eliminated by the temperature they are subjected to when ironed⁽¹⁹⁾.

Manicurists of this research showed low adherence to uniform or apron (68.1%) and also to the use of closed shoes (34%), predominantly washing clothes worn in the salons together with other clothes (21%). Studies with barbers showed lack of care for the clothing and aprons that were not washed or changed regularly (80% -100%)⁽²⁰⁻²¹⁾.

The most common reasons for non-adherence to PPE was the inconvenience or discomfort/allergy during use. Only 10.6% reported not using PPE because the activities they performed did not bring risk of contact with blood, which was found to be coherent with the responses obtained on the knowledge of the PPE, in which 93.2% said it was important to use them in practice.

The discomfort in the use of PPE is shown in other studies, in addition to underestimation of the risks or ignorance of it, and reports of latex allergy from gloves. Underestimation of the risk can be attributed to many aspects of human behavior, the improper perception of an invisible risk (micro-organisms) or unmeasured and no consideration of professional responsibility in the resolution, minimization or prevention of a problem. Evidence of sufficient knowledge of health professionals about the dangers and biological hazards in the activities they carry out, yet not incorporating standard precautions effectively in everyday practice has been registered⁽²¹⁻²²⁾.

Latex allergy has been continuously identified in people working wearing gloves, as health professionals and in Brazil it is estimated that this reached 30% of them compared to 2% in the general population. Those who wear gloves are at increased risk for latex sensitization. The allergens present in latex are proteins that can be absorbed by the skin's natural moisture or indirectly dissolved talc in contact with skin or by inhalation, and the most common signs of reaction to latex is contact dermatitis, urticaria contact, conjunctivitis, rhinitis, asthma and anaphylaxis⁽²³⁾.

Another reason for low adherence to PPE could be inferred for salon unavailability, being not acquired by the owner, to reduce costs or even for lack of knowledge of the requirement of the Health Surveillance. However, this reason was mentioned by only 1.7% of manicurists interviewed. Offering proper PPE

to minimize or reduce the risk of exposure of each activity is an employer's obligation in addition to requiring its use after advice and training of the employee, the employee must follow determinations of the employer on the appropriate use^(5,16).

The role of health surveillance agencies through the sanitary health legislation constitutes a key device for guidance, advice and supervision of the professional activities of these categories. There were few health conditions in Brazil, taking into account the size of the country, with content of sanitary regulations lying outdated and the regulation without leaving obvious and detailed specific recommendations aimed at the adoption of biosafety measures. The state of Parana (PR) lists the responsibility of the establishment to provide services under the biosafety guidelines and health with the Safety Code and Consumer Protection, by the Federal Law 8.078, 1990⁽²⁴⁾. This establishes that one of the basic consumer rights is health protection against risks caused by practices in service providers. Thus, aesthetic and beauty salons are suitable for the provisions of this law⁽²⁴⁻²⁵⁾.

Another problem is the missing regulation of the profession of manicurists. If there was a requirement for training of professionals in regular courses providing a biosafety course and schools proposing extracurricular activities (lectures, technical visits), there would be a greater chance of training on this subject.

CONCLUSION

Manicurists interviewed showed better results for the knowledge about the measures of Personal Protective Equipment compared to its adherence.

There was low adherence to personal protective equipment, the uniform, coat or apron, the use of closed shoes and also the removal of accessories. The reuse of gloves was low among the participants in agreement with the majority responses for proper use and the need to discard the gloves between appointments. With regard to knowledge about the use of PPE, most claimed to be mandatory for all procedures.

The intervening factors referred by professionals to non-adherence to PPE were the inconvenience and discomfort, allergy in the use of PPE, references concerning the unavailability of them in salons was low.

From the findings, we suggest a widespread campaign for the clarification of aesthetic and beauty salons professionals and owners about PPE and care for personal hygiene, to improve the PPE practice, following the legal recommendations related to greater attention to safe attitudes that minimize occupational biohazards. The State is supposed to develop a specific policy on biosafety for this industry, with its duties, as well as strict surveillance. In addition, health professionals must implement actions to achieve the biosafety standards in the reality of these services, as well as health education for both aesthetic and beauty professionals and for society who are clients, both located in the territories of scope of health services. State, health professionals and society as a whole should be actors responsible for the development of safe practices in this regard. The nurse, as a member of the health team, has the aim of planning, executing and evaluating health programs, and ensuring public health, either by direct action on health surveillance or by education care and research activities aimed at improving population's health.

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