COSMETICS USAGE HABITS AND EFFECT ON HEALTH SEEKING BEHAVIOR AMONG JORDANIAN WOMEN

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ABSTRACT

Cosmetics are composed of a mixture of chemicals and natural compounds, and most adverse effects occur due to sharing the same products and using the makeup after the expiry date. This behavior tends to increase the side effects of cosmetics due to pathogenic infections. Lack of awareness and knowledge were found to be the main factors that could affect women's perception which plays a critical role in using expired cosmetic preparations and had negative impact on health behavior. It has been shown that awareness, reference groups, experience, and information produced a statistically significant effect on the perception. In addition, knowledge didn't have a statistically significant effect. Regarding utilizing the second-hand used cosmetics products, 84 % of women agreed that they have used those that belonged to another person. There is a need to educate women about the possible risks of expired or previously used cosmetics by formal channels, internet websites, and social media.

Keywords: Cosmetics, expired cosmetics, adverse effect; cosmetics usage; make-up expiration date

INTRODUCTION

A cosmetic product is any preparation intended for applying on external parts of the body for cleaning, coloring, softening, covering, nourishing and protection[1,2]. The Food and Drug Administration (FDA) defined cosmetics as all products proposed to be applied to the human body for beautifying and without disturbing the body's structure and functions[3,4]. Most of people assume that beauty care products should be easy to use, are compounds that are effective and safe, and have no risk to the human health[1,5,6], but rarely their use can be combined with adverse reactions such as local reactions, systemic reactions, and more severe complications[7-9]. It was found that skin care products, hair preparations, and facial make-up were responsible for the majority of these reactions[10,11]. Eye make-up products may generate a number of allergic and infectious reactions such as contact dermatitis[12,13]. Most adverse effects occurred due to individual susceptibility, sharing the same products, improper storage conditions, and improper handling procedures during use and throughout manufacturing, negatively affecting the makeup properties. Also, using the makeup after the expiry date tends to increase the vulnerability for adverse effects because these have a high level of contamination with pathogenic microorganisms[6,14].

A study was conducted to investigate female students' performances regarding the use of make-up and measure the quantity of microbiological contamination in mascaras utilized by this population. Microbiological analysis has shown that *S. aureus* was present in 79 % and *P. aeruginosa* in 13 % of mascara samples[8]. Also, several cases of microbiological contamination of cosmetics were higher than that used by one person, and the expired cosmetics showed the highest microbiological contamination[15]. Due to excessive use of cosmetics in Jordan and lack of studies investigating the knowledge if

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these products are expired or not, this study was performed to assess the awareness of women of the adverse effects resulting from the use of expired or second-hand cosmetic products.

MATERIALS AND METHODS

Study design

This study was conducted in Jordan from May to September 2020. Google form surveys were used to ensure the recording of harmful effects from the use of expired cosmetics[15]. A simple 410 random sampling strategy was used to collect data. Four hundred and ten women were recruited and their demographic data reported. To ensure the quality of the survey, we set the response range of some items (e.g., the age, income, marital state, job title). Finally, a total of 410 women who completed the questionnaires were included in the analysis[15].

Study model

Fig. 1 represents the study model which shows the study research problem, objectives and hypotheses[16,17]. The hypothesis of this study was to investigate the impact of independent factors (knowledge, experience and information, awareness and reference group) on the dependant factor (woman perception).

Statistical analysis

The study aimed to document the impact of woman awareness on the use of expired cosmetics. Therefore, bivariate correlation analysis, linear regression, two-sample t-test and one-way ANOVA were conducted using SPSS® software, Version 21[18]. Values of $p \leq 0.05$ are considered to be significant.

RESULTS AND DISCUSSION

The harmful effects of cosmetics may occur not only due to improper handling and unsuitable storage circumstances of these products, but also due to the use of products after the expiration date and sharing the same product with other people. Intense contamination results from sharing these products because each individual has a distinctive flora on their skin, which may be deleterious to other individuals. In addition, unsuitable storage conditions are harmful, because most women store their make-up in the bathroom that encourages the growth of fungi and bacteria. Likewise, poor handling can adversely affect the preservation of make-up properties[6].

The general opinion of women in Jordan towards their awareness about adverse effects resulting from the use of expired and used cosmetic products was tested based on data collected from a random sample of women. Table I shows the multiple regression analyses between the knowledge, experience and information, awareness

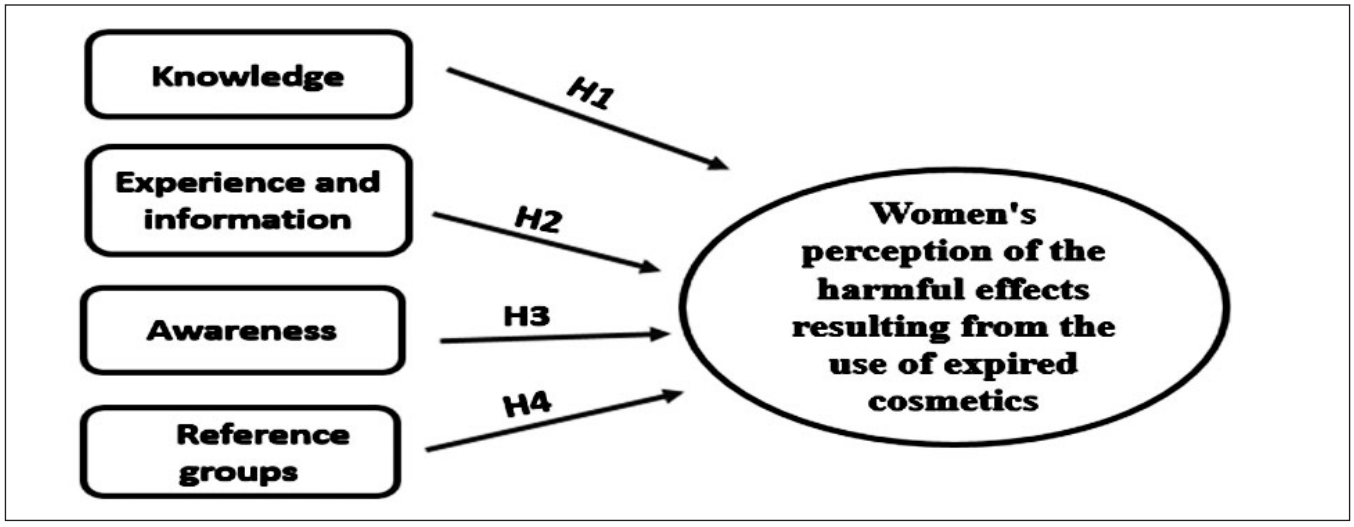

Fig. 1: Study model; women's awareness about adverse effects resulting from the use of expired cosmetic products. H1; there is an impact of Knowledge on woman perception of harmful effect results from the used of expired cosmetics, H2; there is an impact of experience and information on woman perception of harmful effect results from the used of expired cosmetics, H3; there is an impact of awareness on woman perception of harmful effect results from the used of expired cosmetics, H4; there is an impact of reference groups on woman perception of harmful effect results from the used of expired cosmetics

Table I: Results of multiple regressions of the first main hypothesis

Dependent variable	R	R^2	F	Sig.	Independent variable	B	T	Sig.
Perception	0.508	0.258	35.23	0.000	Knowledge	0.003	0.057	0.955
					Experience and information	0.120	2.385	0.018
					Awareness	0.231	5.040	0.000
					Reference group	0.327	5.711	0.000

Table II: Correlations (Pearson correlation) between independent factors and dependent factors

	Knowledge	Experience and information	Awareness	Reference group	
Over all correlation with perception					
	0.282	0.342	0.336	0.424	
Impact of marital status on change in perception					**Sig.**
Single	0.259	0.174	0.449	0.247	
Married	0.280	0.458	0.394	0.357	
Divorced	0.784	0.784	0.737	0.578	0.025
Widower	0.207	-0.389	0.534	0.753	
Impact of age status on change in perception					
15-25	0.259	0.259	0.385	0.229	
26-35	0.331	0.506	0.51	0.508	
36-45	0.313	0.302	0.343	0.155	**0.**317
46-56	0.319	0.406	0.456	0.368	
more than 57	0.017	0.404	0.488	0.662	
Impact of income on change in perception					
Less than 200JDs	0.371	0.363	0.543	0.294	
201-500	0.282	0.425	0.432	0.390	
501-800	0.260	0.367	0.378	0.405	
801-1100	0.148	0.575	0.602	0.343	0.049
1101-1400	0.659	0.412	0.483	0.525	
More than 1401	0.361	0.403	0.396	0.132	
No income	0.229	0.032	0.294	0.223	
Impact of education level on change in perception					
High school	0.371	0.363	0.543	0.294	
Diplomat	0.282	0.425	0.432	0.392	0.913
Bachelor's degree	0.260	0.367	0.378	0.405	
Postgraduate	0.148	0.575	0.602	0.343	

and reference groups on the perception. Table I also shows the research dependent variables (perception) are significant, because the P value is (0.00) which is <0.05, and the calculated F value (35.23), which is more than the F table (2.372). Therefore, we reject the null hypothesis and accept the alternative one which states that there is a statistically significant effect at the level of ($\alpha \leq 0.05$) of the knowledge, experience and information, awareness, and reference groups on the perception. The relationship between the dependent and independent variables is strong and positive. It is >0.5[19], R= 0.508. Also, the $R^2 = 0.258$, which means that the contribution of the independent variables strongly affects the dependent variables with a percentage of 25.8 % since the value of the calculated t value for the variables (awareness: 5.040, reference groups: 5.711, and experience and information: 2.385) are more than the t value table (1.96). This means they have a statistically significant effect on the perception. While knowledge t value was 0.057, which was less than the t value table (1.96), which means knowledge doesn't have a statistically significant effect on the perception.

Lack of awareness is considered one of the main factors that could affect perception in women, which play a critical role in using expired cosmetic preparations[20]. Table II shows that the independent factors (knowledge, experience and information, awareness, and reference groups) and dependant variable (perception) had significant positive linear relationships 0.282, 0.342, 0.336, and 0.424 respectively. A one-way ANOVA was performed to test the effect of marital status on change in perception. Results showed that there was a significant difference, which means that marital status has an impact on perception with p= 0.025, where divorced women showed the highest positive correlations between dependent and independent variables, while widowers showed a negative correlation between experience (information) and perception. Regarding utilizing the used cosmetic products, of the 410 women, 4.2 out of 5 were in agreement that they utilized used cosmetic products. These results indicate a dangerous impact due to the presence of a high level of microbial contamination in cosmetics in those people who utilized them. It can be observed that *Staphylococcus spp*. are the most often strains isolated from used cosmetic preparations. Anelich and Korsten[21] studied 58 used cosmetic samples and demonstrated the presence of *Staphylococcus* in 9.0 % of samples, *Pseudomonas spp*. in 30.0 % of samples, *Enterobacter spp*. in 17.0 %, and the mold *Aspergillus spp*. in 13.0 % of samples[21]. Naz et al.[22] studied different samples of makeup sponges and brushes, and observed the presence of *S. aureus* in 100 % of samples, *P. aeruginosa*, and fungi in more than 50 % of the tested cosmetics. Also, they confirmed that the used waxes were contaminated with *S. aureus* and *P. aeruginosa*[22, 23]. Therefore, the contaminated cosmetics used by many people are considerably higher than in original cosmetics before their expiry date or those used by a single person. Conversely, an average of 2.8 out of 5 (410 women) had previously used expired cosmetics but did not suffer from any skin damage. Thus, the majority of women were using expired cosmetics. Skowron et al.[23], Hugbo et al.[24] as well as Abu Shaqra and Al-Groom[9] reported that the majority of expired cosmetics have no physicochemical changes (change in color, smell, consistency, appearance of sediment or phase separation), and that was the reason why most of the women expected that these preparations have no side effect and no risk for microbial contamination. Hugbo et al.[24] showed that the preservatives employed in cosmetic products did not have the adequate preservative concentration acceptable after the expiry date and thus increased the level of microbial contamination[24]. On the other hand, such contamination may directly affect human health as a result of the formation of harmful microbial metabolites and resulted in spoilage of the products[25].

CONCLUSION

Due to the fact that women consume expired or used cosmetics without full knowledge about the adverse effects of these cosmetics, assessing women's awareness about the several adverse effects of expired cosmetics will help design educational interventions. There is a need to educate women about the possible risks of expired or used cosmetics by formal channels, internet websites, social media, and radio. The conclusion of our results, although not representative of the general population (obtained in a restricted population and geographical area), suggests that it is important to design and implement health education programs by informal educational organizations such as schools and universities to increase and improve women's knowledge and attitudes of the dangers associated with excessive use of cosmetics and reduce the inappropriate use of these agents. The correct usage of these products are of great interest, as well as the mobilization of the health authorities to require the printing of the expiration date on the primary packaging of cosmetics products.

REFERENCES

1. Dehvari M., Ghaneian M. T., Morowatisharifabad M. A., Karimi M. and Jasemizad T.: Knowledge, Attitudes and Practice of Women About Adverse Effects of Cosmetics in Yazd City, **Iran Health Scope**, 2018, 7(1).
2. European Commission.: The rules governing cosmetic products in the European Union, **Cosmetics**

Legislation, 1999, 1.

3. Ilankizhai R. J., Gayathri R. and Vishnupriya V.: Cosmetic contamination awareness among adolescent females. **Asian J. Pharm. Clin. Res**., 2016, 9(5), 117-120.
4. Baki G. and Alexander K. S.: Introduction to cosmetic formulation and technology. John Wiley & Sons, 2015.
5. Cortez-Pereira C. S., Baby A. R. and Velasco M. V.: Fragrance technology for the dermatologist–a review and practical application. **J. Cosmetic. Derm.,** 2010, 9(3), 230-241.
6. Giacomel C. B., Dartora G., Dienfethaeler H. S. and Haas S. E.: Investigation on the use of expired make-up and microbiological contamination of mascaras, **Int. J Cosmetic. Sci**., 2013, 35(4), 375-380.
7. Huf G., Rito P. D. N., Presgrave R. D. F. and Boas M. H. S. V.: Adverse reactions to cosmetic products and the Notification System in Health Surveillance: a survey, **Revista. Brasileira de Epidemiologia.**, 2013, 16, 1017-1020.
8. Di Giovanni C., Arcoraci V., Gambardella L. and Sautebin, L.: Cosmetovigilance survey: are cosmetics considered safe by consumers? **Pharmacol. Res.**, 2006, 53(1), 16-21.
9. Shaqra Q. M. A. and Al-Groom R. M.: Microbiological quality of hair and skin care cosmetics manufactured in Jordan, **Int. Biodeterior. Biodegradation**, 2012, 69, 69-72.
10. Adams R. M., Maibach H. I., Clendenning W. E., Fisher A. A., Jordan W. J., Kanof N. and Storrs F.: A five-year study of cosmetic reactions. **J Am. Acad. Derm.,** 1985, 13(6), 1062-1069.
11. Loden M., and Wessman C.: Mascaras may cause irritant contact dermatitis, **Int. J. Cosmetic. Sci.,** 2002, 24(5), 281-285.
12. Draelos Z. D.: Special considerations in eye cosmetics, **Clin. Dermatol.**, 2001, 19(4), 424-430.
13. Getachew M. and Tewelde T.: Cosmetic use and its adverse events among female employees of Jimma university, southwest Ethiopia, **Ethiopian J. Health Sci.**, 2018, 28(6).
14. Pack L. D., Wickham M. G., Enloe R. A. and Hill D. N.: Microbial contamination associated with mascara use, **Optometry J. Am. Optom. Assoc.**, 2008, 79(10), 587-593.
15. Al-Samydai M. J., Qrimea I. A., Yousif R. O., Al-Samydai A. and Aldin M. K.: The impact of social media on consumers' health behavior towards choosing herbal cosmetics, **J. Crit. Rev.**, 2020, 7(9), 1171-1176.
16. Yousif R. O. and Al-samydai, M. J.: Factors Influencing Woman Behavior to Visit Dental Clinic to Improve their Smile, **Indian J. Public Health Res. Dev.**, 2019, 10(2), 504-509.
17. Al-Samydai M., Al-kholaifeh A., and Al-Samydai A.: The Impact of Social Media in Improving Patient's Mental Image Towards Healthcare Provided by Private Hospitals' in Amman/Jordan, **Indian J. Public Health Res. Dev.**, 2019, 10(2), 491-496.
18. Aburjai T., Yousif R. O., Al Samydai M. J., Al-Samydai A., Al-Mamoori F. and Azzam H.: Protein supplements between consumer's opinion and quality control: an applied study in Jordan, **Int. J. Res. Pharm. Sci.**, 2019, 10(3), 1961-1969.
19. Cohen J.: Statistical power analysis for the behavioral sciences, 1988, 2nd edn., LEA, New Jersey.
20. Rafiq K., Azmi M. B., Saify Z. S., Khan W., Ashraf I., Rahim N., and Baloch N.: Assessment of Knowledge and Practice on Consumption of Expired Pharmaceuticals: A Cross-Sectional Study at Karachi, Pakistan, **J. Appl. Pharm. Sci.**, 2015, 5(04), 040-047.
21. Anelich L. and L. Korsten.: Survey of micro-organisms associated with spoilage of cosmetic creams manufactured in South Africa, **Int. J. Cosmetic. Sci.**, 1996, 18(1), 25-40.
22. Naz S., Iqtedar M., Ul Ain Q. and Aftab K.: Incidence of Human Skin Pathogens from Cosmetic Tools used in Beauty Saloons in Different Areas of Lahore, Pakistan, **J. Sci. Res.**, 2012, 4(2), 523-523.
23. Skowron K., Jakubicz A., Budzynska A., Kaczmarek A., Grudlewska K., ReslinskiA., and Gospodarek-Komkowska E.: Microbiological purity assessment of cosmetics used by one and several persons and cosmetics after their expiry date, **Roczniki Państwowego Zakładu Higieny**, 2017, 68(2).
24. Hugbo P.G., Onyekweli A.O. and Igwe I.: Microbial contamination and preservative capacity of some brands of cosmetic creams, **Trop. J. Pharm. Res**., 2003, 2, 229-234.
25. Haftbaradaran B., Abedi D., Jalali M. and Bagherinejad M. R.: Microbial quality survey of sunscreen products in Iranian market, **Adv. Biomed. Res**., 2014, 3.