

AWARENESS OF HEALTH EFFECTS FROM SKIN WHITENING PRODUCT USAGE: A SYSTEMATIC REVIEW

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ABSTRACT

Background: Skin whitening products are widely used and increasing in demand. However, some of the users are unaware about the health effect of some of the products. Therefore, the main objective of this study was to determine user awareness of health effects from skin whitening applications.

Materials and Methods: This study was a systematic review conducted from February 2018 to May 2018. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) were used to facilitate the article search process. Articles published between January 2013 and December 2017 were searched using six search engines: Google Scholar, Ovid, EBSCOhost, Scopus, PubMed and Wiley. A total of 19 academic articles fulfilled the selection criteria.

Result: A significant fraction of the studies were conducted in African countries (42.0%). The prevalence of skin whitening practices among respondents ranged from 2.6 to 71.9%. The definition of user awareness regarding the adverse effects of skin whitening varied between studies, but the awareness frequency ranged from 2.0% to 79.1%. The prevalence of side effects ranged from 17.0% to 34.9%. Four themes were synthesised after extensive review: health beliefs, health authority, consumer behaviour and the need for social recognition.

Conclusion: The demand for skin whitening has increased over time, so the public health authority should closely monitor the whitening industry to safeguard the health of the Malaysian population.

Keywords: Skin whitening, skin lightening, skin bleaching, awareness, perception, safety, side effect, health effect.

1.0 Introduction

Skin whitening is the whitening of the epidermal layer through the application of homemade, cosmetic or dermatological products (Charles, 2012). Skin whitening is also known as skin lightening or skin bleaching and has been used for centuries (Li, Min, & Belk, 2008). During the Industrial Revolution in the western hemisphere, wealthy people applied lead powder to their faces to differentiate themselves from labourers (Leong, 2006). Skin whitening products have gained widespread acceptance and popularity among non-white cultures (Li et al., 2008). The use of skin whitening products by women with dark skin tone is a common practice in sub-Saharan Africa (Couteau & Coiffard, 2016; Dadzie & Petit, 2009; Saja H Hamed, Reema Tayyem, Nisreen Nimer, & Hatim S AlKhatib, 2010; Petit, Cohen-Ludmann, Clevenbergh, Bergmann, & Dubertret, 2006). Certain herbal plants are also used for skin whitening among women (Couteau & Coiffard, 2016).

Melanocytes are located in the basal layer that separates the dermis and epidermis and are responsible for producing and storing melanin (Smit, Vicanova, & Pavel, 2009). The actual colour of an individual's skin depends on the type and amount of melanin produced and the distribution pattern of melanocytes among keratinocytes. Melanocytes in people with darker skin colour have thicker, longer, branching dendrites. Several active ingredients in skin whitening products inhibit the process of melanogenesis (Parvez et al., 2006).

The concept of beauty can include a combination of qualities—such as shape, colour and form—that please the aesthetic senses, especially sight (Charles, 2012). The definition of beauty is subjective and depends on the individual, but fairness of the skin is an important element in defining female beauty. People often relate fair skin to wealth and desirability in women (Li et al., 2008). To this day, white skin is perceived to be associated with social privileges, including better jobs and marital prospects (Dadzie & Petit, 2009). Consumers show minimal concern about the health effects of skin whitening products. The most important factors in product selection by consumers are ingredients and cost (Rusmadi, Ismail, Norkhadijah, & Praveena, 2015). Even though consumers acknowledge the possible side effects, they remain loyal to the same products (Kamagaju et al., 2016). Misuse of skin whitening products can happen, especially among those who have less knowledge and awareness of health. Approximately 50% of consumers of skin whitening products do not report it when they develop side effects (Yousif, Ahmed, Idris, Elmustafa, & Ahmed, 2014).

Studies have been conducted on animals as well as on humans regarding the side effects of skin whitening (Ali & Khwaja, 2016). Hydroquinone, mercury and corticosteroids are the most common and well-known active depigmenting agents that can cause adverse health effects in consumers either local or systemic complications (Dadzie & Petit, 2009; Desmedt et al., 2016). Despite an increasing number of side effects reported, the use of skin whitening products remains prevalent worldwide (Cristaudo et al., 2013; N. C. Dlova, Hamed, Tsoka-Gwegweni, & Grobler, 2015; Gul, Monazzam, Rashid, & Ali, 2014; Kuffour, Dartey, Owusu, & Dabuoh; Lartey et al., 2017; Peltzer & Pengpid, 2017; Rusmadi et al., 2015; Wong et al., 2017; Yousif et al., 2014). Illegal manufacturing of skin whitening products provides low-cost, easily available products on the market (Couteau & Coiffard, 2016; Dadzie & Petit, 2009).

In Malaysia, the Ministry of Health is responsible for control and regulation of cosmetic products under the *National Pharmaceutical Regulatory Agency*. The following laws and legislations in Malaysia are applicable to this issue: Sale of Drugs Act 1952, Control of Drugs and Cosmetics Regulations 1984, Dangerous Drugs Act 1952, Poisons Act 1952, Medicines (Advertisement & Sale) Act 1956, Patents Act 1983, Medical Device Act 2012 and Trade Descriptions Act 2011. The main objective of this study was to determine global consumer awareness of the health effects of skin whitening products.

2.0 Materials and Methods

This study was a systematic review in which the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were followed. The study began with a thorough literature search. Six search engines were used to find relevant articles: Google Scholar, Ovid, EBSCOhost, Scopus, PubMed and Wiley. The chosen keywords were based on three domains: skin whitening, awareness and side effects shown as following:

“Skin whitening” OR “Skin lightening” OR “Skin bleaching” OR “Fairness cream”

AND

“Awareness” OR “Perception” OR “Knowledge” OR “Attitude” OR “Practice”

AND

“Safe” OR “Safety” OR “Side effect” OR “Health” OR “Health effect”

Synonyms were determined for each word. Various search strategies were used to aid the process of finding relevant articles, including subtraction, addition, option, similar result, exact match, wild card, hash tag, and adjacent. The keywords used in the literature search are shown in Figure 1. The activities in each phase were conducted at the same time by two reviewers to avoid selection and analysis bias and to determine consensus between the two reviewers.

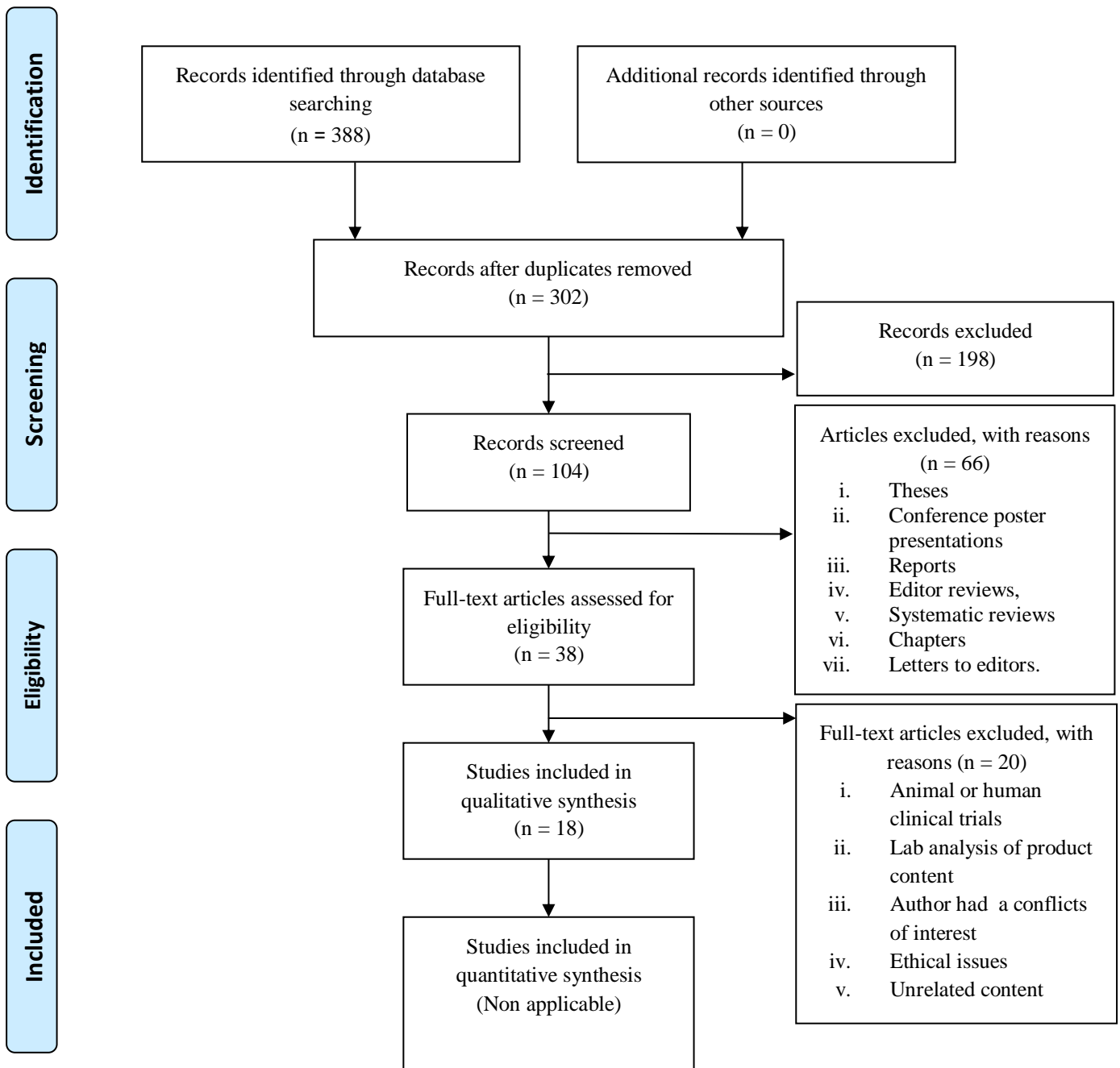


Figure 1. PRISMA flow guideline

During the identification phase, article searching was done in each of the selected databases. The criteria for article selection were: published between January 2013 and December 2017, available in English, file available in PDF form, published in an academic journal, and within the health and science fields. Different databases have unique tricks for finding the desired

articles. In general, basic synonym words and search strategies were applied in each search engine. As a result, a total of 388 articles were found after a thorough search.

During the screening phase, duplicates were identified since the same article may exist in multiple search engines. The removal of similar or duplicate articles was done using EndNote version 7. Eighty-six articles were removed from the initial search ($n = 388$), leaving 302 articles for further specification. Certain articles were excluded based on a title and abstract reading assessment. There were 198 articles with unrelated titles and abstract content that diverted far from the objective of this study. The irrelevant titles covered topics such as 1) teeth whitening and dental bleaching, 2) aquatic and marine studies related to coral bleaching, 3) topical steroids or toning creams. Of the remaining 104 articles screened, 66 articles were excluded because of unmet inclusion criteria; these included theses, conference poster presentations, reports, editor reviews, systematic reviews, chapters, or letters to editors.

During the eligibility phase, 38 full-text articles were read and assessed. A total of 20 articles were removed because they involved the following: animal or human clinical trials, lab analysis of product content, conflicts of interest, ethical issues or unrelated content. A final total of 18 articles were included in the qualitative synthesis. In this phase, the contents of the articles were analysed to obtain and develop relevant themes that suited the objectives of the present study.

Table 1. The number of articles from each search engine in each phase of the systematic review.

Phase	EBSCOhost	PubMed	Ovid	Scopus	Wiley	Google Scholar	Total
Identification	96	37	105	6	113	31	388
Screening	27	13	18	2	21	23	104
Eligibility	8	7	4	1	8	10	38
Included	4	4	2	1	3	4	18

3.0 Result

The geographical locations of the chosen studies included countries such as Malaysia, Thailand, Pakistan, India, South Africa, Sudan, Cameroon, Ghana, Rwanda, Italy, and Sweden. A total of 16 articles were from the Asian and African continents, and two from Europe. All articles included in this review were observational, with 16 cross-sectional studies, one qualitative study and one mixed-method study.

The studies mainly included females from varying backgrounds. Studies in certain countries—mainly India—also included male respondents. The sample size ranged from $n = 30$ to $n = 3,259$. Most of the studies measured the prevalence of skin whitening use, awareness, and socio-demographic factors associated with the use of skin whitening products, while the one qualitative study explored themes pertaining to the practice of skin whitening use. Several studies also reported common side effects and ingredients used in the products. Table 2 summarises the studies included in the review.

The prevalence of skin whitening practices among respondents in the studies ranged from 2.6% (Elisabeth Darj, Jennifer J Infanti, Beth Maina Ahlberg, & Jecinta Okumu, 2015) to 71.9%, with the highest occurring in India (Wong et al., 2017). Awareness regarding the adverse effects of skin whitening products was measured by various definitions. Overall, awareness about health effect of skin whitening products ranged from 2.0% (Chohan et al., 2016) to a maximum of 79.1%, which was reported in five ASEAN countries in which the study population consisted of university students (Peltzer & Pengpid, 2017). The frequency of side effects reported ranged from 17.0% to 34.9%. The highest reported occurrence of side effects was found in a study in Malaysia (Rusmadi et al., 2015) in which respondents reported having experienced skin problems from the product, including skin peeling (12.5%) and acne (8.7%), which were the most common symptoms experienced.

Approximately 60% of respondents faced negative reactions after product usage in the study done by Ayob et al. (2016) (Ayob et al., 2016), whereas the study done in Pakistan by Gul et al. (2014) (Gul et al., 2014) stated that 31% experienced blemishes & acne, 23% had dark patches and uneven skin tone, and 5% had irritation problems as a result of using skin whitening products. The study by Kuffour et al. (2014) (Kuffour et al.) in Ghana mentioned that approximately 7.5% of users experienced related side effects following application of the skin whitening products. Yousif et al. (2010) (Yousif et al., 2014) reported that 3.3% of respondents in Sudan had skin irritation, but 50% of those participants did not report to the relevant authorities after developing side effects. A majority of the studies reported more than one adverse effect.

The reviewers synthesised four themes after extensive review of the included articles in order to answer research questions pertaining to the extrinsic and intrinsic factors determining the use of skin whitening products among respondents, despite its potential adverse effects. The four themes are health beliefs, health authority, consumer behaviour and the need for social recognition.

Table 2. Summary of included studies

No.	Author	Year	Country	Title	Sample size (n)	Study Design	Prevalence of Use (%)	Awareness (%)	Side Effects (%)	Themes
1.	Ahmed	2016	Sudan	Use of Skin-Whitening Products by Sudanese Undergraduate Females: A Survey	348	Cross-sectional	74.4	NA	NA	Consumer behaviour
2.	Ayob	2016	Malaysia	The enlightenment from Malaysian consumers' perspective toward cosmetic products	30	Qualitative	NA	NA	60.0	Health Beliefs
3.	Chohan S.	2014	Pakistan	Facial abuse of topical steroids and fairness creams	200	Cross-sectional	17.0	2.0	NA	Health Beliefs
4.	Cristaudo A.	2013	Italy	Use of Potentially Harmful Skin-Lightening Products among Immigrant Women in Rome, Italy: A Pilot Study	82	Cross-sectional	40.2	41.5	58.5	Consumer behaviour
5.	Darj E.	2014	Sweden	"The fairer the better?" Use of potentially toxic skin bleaching products	857	Mixed-method	2.6	NA	NA	Health authority roles
6.	Dlova	2017	South Africa	Women's perceptions of the benefits and risks of skin-lightening creams in two South African communities	579	Cross-sectional	32.3	89.0	NA	Consumer behaviour
7.	Dlova	2014	South Africa	Skin lightening practices: an epidemiological study of South African women of African and Indian ancestries	600	Cross-sectional	32.7	89.0	23.0	Need for social recognition
8.	Kamagaju	2016	Rwanda	Survey on skin-lightening practices and cosmetics in Kigali, Rwanda	150	Cross-sectional	35.0	NA	NA	Need for social recognition
9.	Kuffour	2017	Ghana	Level of Awareness of Effects of the Use of Cosmetic Bleaching Products among Women: A Case Study of Bolgatanga Municipality of Ghana	120	Cross-sectional	39.2	25.8	7.5	Need for social recognition
10.	Kouotou	2017	Cameroon	Skin whitening among Cameroonian female university students: knowledge, attitudes,	620	Cross-	27.3	7.7	NA	Need for social

				practices and motivations		sectional				recognition
11.	Lartey M.	2017	Ghana	Use of skin-lightening products among selected urban communities in Accra, Ghana	555	Cross-sectional	50.3	NA	NA	NA
12.	Peltzer	2017	ASEAN countries	Knowledge about, attitude toward, and practice of skin lightening products use and its social correlates among university students in five ASEAN countries	3259	Cross-sectional	40.5	79.1	NA	Consumer behaviour
13.	Rusmadi S.Z.	2015	Malaysia	Preliminary Study on the Skin Lightening Practice and Health Symptoms among Female Students in Malaysia	104	Cross-sectional	60.6	94.6	NA	Need for social recognition
14.	Sangsuwon C.	2016	Thailand	The lack of awareness of using skin whitening cosmetics: in case of women in Bangkok, Thailand	100	Cross-sectional	69.4	70.0	NA	Need for social recognition
15.	Shroff	2017	India	Skin Color, Cultural Capital, and Beauty Products: An Investigation of the Use of Skin Fairness Products in Mumbai, India	1992	Cross-sectional	54.4	NA	17.0	Need for social recognition
16.	Somia	2014	Pakistan	Hidden Killers for Women: Mercury, Steroids and Hydroquinone in Skin Whitening and Bleach Creams	200	Cross-sectional	61.0	18.0	NA	Need for social recognition
17.	Wong C.	2017	India	Use of Skin-Lightening Products among Outpatient Attendees in a North Indian Hospital	208	Cross-sectional	71.9	NA	20.0	Consumer behaviour
18.	Yousif	2014	Sudan	The Use of Bleaching Creams among Central Sudan Students	1187	Cross-sectional	55.4	NA	3.3	Consumer behaviour

NA – Not available

4.0 Discussion

The results of this review revealed that the use of skin whitening and topical bleaching agents is very common, particularly among women in Asia and Africa. Women of different ages, classes and professional status are seeking lighter complexions and are consequently using such products excessively, which results in a significant prevalence of adverse effects. Several studies reviewed also included males as respondents; however, despite a significant prevalence of males using skin whitening products, the quantitative data was limited to that published by Wong et al. (2017) (Wong et al., 2017).

The highest prevalence reported was from an article published by Wong et al. (2017) (Wong et al., 2017). This study outlines favourable views of lighter skin, likely a social impetus for use of skin whitener. Most participants agreed that lighter skin tone improved confidence and granted a more youthful appearance, but few felt that it influenced employment prospects, marriageability, and social class. The perceptions of marriageability and employment differed from existing qualitative research undertaken elsewhere in India. A similar study from Jordan (S. H. Hamed, R. Tayyem, N. Nimer, & H. S. Alkhatib, 2010) outlined different response patterns; Jordanians perceived lighter skin as being associated with beauty and marriage prospects, but not with self-confidence, youthfulness, or social status. Clearly, perceptions of fair skin differ between various ethnicities and communities.

The lowest prevalence of product usage was found in a study by Darj et al. (2015) (E. Darj, J. J. Infanti, B. M. Ahlberg, & J. Okumu, 2015) in an immigrant population attending a hospital in Sweden, with only 2.6% ($n = 12$). Skin whitening products were used by 2.6% of pregnant women, though significantly more by women born in non-European countries. Motivating factors were associated with the concept of beauty together with social and economic advantages. The women had low awareness of the potential health risks of using the products.

There are real and increasing health risks involved in the skin whitening practices described; the participants were aware of these risks to differing extents, but they continued to use them. However, despite knowing and being aware of the danger of skin whitening products, people do not stop using them, as they believe that having a lighter skin tone is best for their own self-satisfaction (Kouotou, Nansseu, Adegbedi, Mebara, & Ndam, 2017). Awareness alone is not enough; knowing the health risk is, it seems, not a successful preventive against these practices. It is also evident that the socio-cultural context of how health is understood and improved remains a pressing consideration. These factors are of importance to any behavioural change approaches seeking to address the health-related problems associated with these beauty practices. Therefore, one of the themes suggested with regards to the skin whitening topic is health beliefs. It is important to control the use of skin whitening and bleaching products and to educate women about the dangers associated with this practice. Increased awareness should reduce the abuse of these agents.

Each culture has a set of general beliefs about what constitutes femininity, female attractiveness and beauty (Ahmed & Saltus, 2015). These beliefs are embedded in societies, shaped by societal factors, and thus variable in time and place. Furthermore, conceptualising female physical beauty in any country is a dynamic process; the beauty practices and the

methods used to achieve beauty have changed and evolved over time, including the use of potentially hazardous substances.

In this review, we found that there were no standard validated tools used to measure awareness or perceptions of respondents towards potential adverse health effects of skin whitening products. Most cited questionnaires used were adapted from Hamed et al. (2010) (S. H. Hamed et al., 2010) from a study in Jordan. Many studies developed their own questionnaires as a tool, each customised to particular countries and cultural beliefs, making it difficult to generate a broad understanding related to perceptions.

The study done by Hamed et al. (2010) (S. H. Hamed et al., 2010) showed that the top three most common perceptions were that lighter skin tone increases a woman's chance of getting married (63.4%), men consider women with lighter skin to be more beautiful (62.6%), and lighter skin tone is more beautiful (62.3%). This study reported that the least common perception of lighter skin tone was that women belong to a higher social class, with only 25.2%. According to Robinson (2011) (Robinson, 2011), the perception of having lighter or fairer skin is important for understanding the motivations behind the practice of skin whitening among respondents. A study by Askari (2013) (Askari, Sajid, Faran, & Sarwar, 2013) showed that the most common perceptions of respondents in Lahore were that men consider women with lighter skin to be more beautiful (82.0%), lighter skin tone increases a woman's chance of getting married (70.5%), and lighter skin tone is more beautiful (59.0%). The least common perception they had was that lighter skin tone implies that a woman belongs to a higher social class (19.7%).

Culture-related perceptions of beauty in association with fair skin are common and are perpetuated by the use of fair-skinned models to market skin whitening products to dark-skinned consumers, especially from Asian and African ancestries (N. Dlova, Hamed, Tsoka-Gwegweni, Grobler, & Hift, 2014). These perceptions are coded as individual needs for social recognition in terms of physical attractiveness. This theme explained an intrinsic factor on why people tend to use skin whitening products. Additional factors mentioned in other studies that influenced people to buy and use skin whitening products included reasonable price, information from friends, relatives and peers, influence from family members, age, gender, occupation and education level. Transcriptions from the articles also showed that regulation and labelling of the products were highlighted by the respondents, which concerns the role of the health authority in curbing use and preventing hazardous skin whitening products from circulating on the market (E. Darj et al., 2015). This transcription was further grouped under the theme of health authority roles.

5.0 Conclusion and Recommendation

In summary, the prevalence of skin whitening ranged from 2.6 to 71.9% in the studies included in this systematic review. It is believed that the demand for skin whitening will increase in the future in view of perceptions about the definition of beauty, overwhelming advertisements, the availability of the product, and affordable price. However, the awareness of potentially adverse effects of the product is neglected. This situation puts the consumer at

high risk of developing acute and chronic side effects. The public health alert should be triggered to overcome this issue, especially in Malaysia. Current public health teams should put in effort to ensure the safety of the products and a healthy population.

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Conflict of Interest

The authors declare no conflict of interest

Declaration

Author(s) declare no conflict of interest

Authors contribution

Author 1: Data analysis and article writing

Author 2: Data analysis and article writing

Author 3: Review and finalization of the article writing

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