The Use of Antiseptic Soaps and Disinfectants in a Semi-Urban Community in Lagos

Cole-Adeife OM[1] FMCP, **Anaba EL**[1,2] FWACP, **Otrofanowei E**[3] FMCP, **Akinkugbe AO**[3] FWACP, **Ayanlowo O**[3] FWACP

[1] Dept of Medicine, Lagos State University Teaching Hospital, Ikeja, Lagos, Nigeria
[2] Dept of Medicine, Lagos State University College of Medicine, Ikeja, Lagos, Nigeria
[3] Lagos University Teaching Hospital/ College of Medicine, University of Lagos, Nigeria
Corresponding Author: Dr Cole-Adeife O.M, Dermatology Unit, Department of Medicine, Lagos State University Teaching Hospital, Lagos, Nigeria
Email: ocole@lasuth.org.ng ; fomcole@yahoo.com; ***Phone:*** +2348037133139

ABSTRACT

Background: The use of antiseptic soaps and disinfectant liquids for bathing appears to be a common household practice in Nigeria today. While this practice is presumed to improve cleanliness and prevent infections, there are concerns about the untoward effects of these antiseptic agents on the skin microbiome, the immune system, and the environment. Few studies document the prevalence and reasons for the household use of antiseptic soaps and disinfectants in Nigeria.

Objective: The objective of this study was to determine the prevalence, reasons for use, and source of information that influenced the use of antiseptic soaps and disinfectants among traders in a market in Lagos.

Methodology: This was a cross-sectional survey conducted using an interviewer-administered pre-validated questionnaire. The questions were on demographic data, use, reasons for use, and sources of information on both antiseptic soaps and disinfectant liquids.

Results: A total of 307 traders participated in the study. 67.4% were female, 32.6% were male, and the mean age of participants was 42.7±12.8 years. Fifty-four per cent (54.1%) of study participants bathed with antiseptic soaps, while 43% used disinfectant liquids in their bathwater. The two most given reasons for use were that it removes germs (62.9%) and prevents skin infections (44.7%). The most common source of information about these products was self, followed by adverts.

Conclusion: Over 50% of the study participants were conscious of hygiene and skin infections. Most survey participants perceived antiseptic soaps and disinfectants to offer protection against disease-causing germs, and this perception was mainly due to media adverts and personal opinions.

Keywords – antiseptic liquids, anti-bacterial soaps, skin microbiome

L'utilisation de Savons Antiseptiques et de Désinfectants dans une Communauté Semi-urbaine à Lagos

Contexte: L'utilisation de savons antiseptiques et de liquides désinfectants pour le bain semble être une pratique domestique courante au Nigeria aujourd'hui. Bien que cette pratique soit supposée améliorer la propreté et prévenir les infections, les effets indésirables de ces agents antiseptiques sur le microbiome cutané, le système immunitaire et l'environnement suscitent des inquiétudes. Peu d'études documentent la prévalence et les raisons de l'utilisation domestique des savons antiseptiques et des désinfectants au Nigeria.

Objectif: L'objectif de cette étude était de déterminer la prévalence, les raisons de l'utilisation et la source d'information qui influençaient l'utilisation des savons antiseptiques et des désinfectants chez les commerçants d'un marché de Lagos.

Méthodologie: Il s'agissait d'une enquête transversale menée à l'aide d'un questionnaire prévalidé administré par un intervieweur. Les questions portaient sur les données démographiques, l'utilisation, les raisons de l'utilisation et les sources d'information sur les savons antiseptiques et les liquides désinfectants.

Résultats: Au total, 307 commerçants ont participé à l'étude. 67,4 % étaient des femmes, 32,6 % étaient des hommes et l'âge moyen des participants était de 42,7 ± 12,8 ans. Cinquante-quatre pour cent (54,1 %) des

participants à l'étude se sont baignés avec des savons antiseptiques, tandis que 43 % ont utilisé des liquides désinfectants dans l'eau de leur bain. Les deux raisons d'utilisation les plus citées étaient qu'il élimine les germes (62,9 %) et qu'il prévient les infections cutanées (44,7 %). La source d'information la plus courante sur ces produits était soi-même, suivie des publicités.

Conclusion: Plus de 50 % des participants à l'étude étaient conscients de l'hygiène et des infections cutanées. La plupart des participants à l'enquête percevaient que les savons antiseptiques et les désinfectants offraient une protection contre les germes pathogènes, et cette perception était principalement due aux publicités dans les médias et à l'opinion personnelle.

Mots-clés: Liquides Antiseptiques, Savons Antibactériens, Microbiome Cutané

Introduction

Soaps are a major component of personal and household hygiene for all people.[1] They are cleaning agents made by combining naturally occurring fats or oils with an alkali, usually potassium or sodium hydroxide, a process known as saponification.[1,2] Soaps act by emulsifying grease and oils and lowering the surface tension of water to penetrate to remove dirt easily.[1,2] They also kill microorganisms by disorganizing the lipid bilayer and denaturing the proteins of their cell membrane hence their importance in preventing infectious diseases.[3,4]

Disinfectant liquids contain antimicrobial chemical agents and were originally designed for hospital use to prevent infection, but they have gained popularity with the general public over time. In some households, they are added to bathwater in addition to being used to clean bathrooms and toilets.[5] Common examples of the chemical agents found in household antiseptic soaps and liquids include but are not limited to triclosan, triclocarban, and chloroxylenol, also known as para-chloro-meta-xylenol (PCMX), chlorhexidine, and monosulfiram.[5]

Antiseptic soaps, also known as medicated soaps or anti-bacterial soaps, often contain smaller concentrations of these chemical agents.[5–7] Antiseptic soaps and disinfectant liquids are often promoted as being more effective at eliminating unwanted, potentially infectious microorganisms from the skin and the surroundings, thereby reducing the risk of infections.[6,8,9] Many people seem to believe this, hence their popularity in Nigeria and many countries in Africa and Asia where there is a high burden of communicable diseases.[6–8] They are frequently advertised, readily available in the market, and used in homes for everyday bathing and cleaning.[7–11]

However, there are increasing concerns that the risks of regular use of these soaps and liquids outweigh the benefits.[2,6,11,12] Some researchers have shown that the overuse of these antiseptic soaps and disinfectants may increase the risk of infections rather than reduce it.[2,6,7] They have been found to negatively affect the normal microflora on the skin, distorting its microbiome and increasing susceptibility to opportunistic skin infections.[2,6,7] Some studies have reported antiseptic liquids as triggers for irritant contact dermatitis and hormonal disruption.[13,14] Antiseptic soaps and disinfectants have also been shown to propagate antimicrobial resistance and harm the environment.[12,15]

Clinical interactions and undocumented or anecdotal reports suggest that the use of these soaps and liquids for bathing is common. However, very few studies document the prevalence and reasons for using these antiseptic soaps and liquids in Nigeria. Documenting this is important for developing health and behavioural strategies to discourage regular household use given the associated negative health implications.

Objective

The objective of this study was to determine the prevalence of use, reasons for use, and the source of information that influenced the decision to use antiseptic soaps and disinfectant liquids among traders in a market in Lagos.

Methodology

A community-based cross-sectional survey was conducted with an interviewer-administered questionnaire. The target population for the survey were traders at Sandgrouse market in Lagos, a populous and multi-ethnic city in South-West Nigeria. Ethical approval for the study was obtained

from the Lagos State University Teaching Hospital Research Ethics Committee. (LREC/06/10/1297). Consent for the survey was sought and obtained from the Traders' union leader, and individual verbal and written consents were obtained from all participants. Demographic data, the prevalence of use, reasons for use, and sources of information on both antiseptic soaps and disinfectants were obtained/recorded.

The data was analysed using the IBM statistics software version 22. Descriptive statistics such as means and standard deviation were used to describe age, while categorical variables were presented in percentages. Categorical variables of two or more independent groups were compared using the Chi-square test, while the student t-test and ANOVA were used to compare the means of two or more independent groups, respectively. P values < 0.05 were considered significant for all statistical tests.

Results

A total of 307 traders participated in the survey. Table 1 shows the age and gender distribution of the survey participants. Most participants (207; 67.4 %) were female, and the mean age was 42.7±12.8 years.

More than half of the survey participants (54.1%) used medicated soaps, while 43% of the participants used disinfectant liquids in their bathwater. (Table 2) Sixty-seven participants (21.8%) used both antiseptic soaps and liquids.

The most common reasons for using antiseptic soaps and disinfectants were that they remove germs (83; 62.9%) and prevent skin infections (59; 44.7%).

Female participants used disinfectant liquids more than males. The difference was statistically significant ($p<0.001$). More females also used antiseptic soaps than males, but the difference was not statistically significant. Age did not appear to be a significant factor in the use of antiseptics. (Table 3)

Table 4 shows the common sources of information about antiseptic liquids. The most common source was self, followed by adverts.

Table 1: Demographic data of survey participants

Variable	Frequency (n = 307)	Percentage (%)
Age group (years)		
< 25	27	8.8
25 – 29	24	7.8
30 – 34	27	8.8
35 – 39	50	16.3
40 – 44	47	15.3
45 – 49	37	12.1
50 – 54	38	12.4
55 – 59	21	6.8
≥ 60	36	11.7
Gender		
Male	100	32.6
Female	207	67.4

Table 2: Antiseptic soap and disinfectant use among study participants

Variable	Frequency (n = 307)	Percentage (%)
Use of Antiseptic soap		
Yes	166	54.1
No	141	45.9
Type of Antiseptic soap used	**n = 165**	
Awa Medicated soap	5	3.0
Delta soap (**triclosan, trichorocarban**)	4	2.4
Dettol **(chloroxylenol)**	70	42.4
Meriko **(triclosan)**	2	1.2
Okin **(p-chlorocresol)**	8	4.8
Premier cool **(chloroxylenol)**	24	14.5
Septol **(triclosan)**	5	3.0
Tetmosol **(monosulfiram)**	31	18.8
Tura **(triclosan, mercury)**	9	5.5
Can't remember	7	4.2
Use of disinfectants	**n = 307**	
Yes	132	43.0
No	163	53.1
No response	12	3.9
Use of both antiseptic soaps and disinfectants	**n = 307**	
Both	67	21.8
Reason for use of disinfectants	**n = 172**	
Makes my body cleaner	14	10.6
Removes germs	83	62.9
Prevents skin infection	59	44.7
Prevent other infections	12	9.1
Dirty water	4	3.0

Table 3: Age and gender distribution for use of antiseptic soaps and disinfectants

Use of disinfectants	**Yes**	**No**	
	n = 132 (%)	**n = 163 (%)**	**p-value**
Gender			
Male	29 (29.6)	69 (70.4)	<0.001*
Female	103 (52.3)	94 (47.7)	
Age group			
< 30	27 (55.10)	22 (44.9)	
30 – 39	35 (47.9)	38 (52.1)	
40 – 49	35 (44.3)	44 (55.7)	
50 – 59	22 (37.9)	36 (62.1)	
≥ 60	13 (36.1)	23 (63.9)	
Mean±SD	41.1±12.5	44.3±3	0.029*
Antiseptic soap use	**Yes**	**No**	
	n = 166 (%)	**n = 141 (%)**	**p-value**
Gender			
Male	57 (57.0)	43 (43.0)	**0.42**
Female	109 (52.7)	98 (47.3)	
Age group			
<30	28 (56.0)	22 (44.0)	
30-39	38 (52.0)	35 (48.0)	
40-49	48 (57.1)	36 (42.9)	
50-59	35 (54.7)	29 (45.3)	
≥ 60	17 (47.2)	19 (52.7)	
Mean±SD			

Table 4: Age and gender distribution of source of information for soap & disinfectant use

Who introduced to disinfectant use	n = 132	Percentage (%)
Parents	13	9.8
Friends	10	7.6
Doctor	12	9.1
Pharmacist	1	0.7
Adverts	23	17.4
Other relatives	5	3.8
Social media	1	0.7
Neighbours	4	3.0
Self	50	37.9
Vendors/Sellers	6	4.5
Others	7	5.3

Variable	Source of Information					
	Self	Relatives	Health workers	Friends & Neighbours	Adverts, SM	
	n = 50 (%)	n = 18 (%)	n = 19 (%)	n = 14 (%)	n = 24 (%)	p-0.04*
Male	5 (20.8)	6 (25.0)	1 (4.2)	4 (16.7)	8 (33.3)	
Female	45 (44.6)	12 (11.9)	18 (17.8)	10 (9.9)	16 (15.8)	
Age group						
< 30	9 (37.5)	6 (25.0)	3 912.5)	2 (8.3)	4 (16.7)	
30 – 39	17 (50.0)	3 (8.8)	4 (11.8)	3 (8.8)	7 (20.6)	
40 – 49	13 (38.2)	5 (14.7)	5 (14.7)	5 (14.7)	6 (17.6)	
50 – 59	8 (40.0)	3 (15.0)	3 (15.0)	1 (5.0)	5 (25.0)	
≥60	3 (23.1)	1 (7.7)	4 (30.8)	3 (23.1)	2 (15.4)	
Mean ± SD	40.0±11.4	38.2±13.4	44.3±13.2	43.8±14.7	42.9±11.1	

Discussion

The use of antiseptic soaps and disinfectants for personal hygiene is quite common in Nigeria and many other countries in the Global South.[2,7,8,10,16] In this study, more than half of the study population use antiseptic soaps for bathing, and up to 40% also put antiseptic liquids in their bathwater. The reason for use appears to be that many people are conscious of germs and infectious diseases and this is similar to reasons documented in other studies.[7,8,11] They seek protection against skin infections and perceive medicated soaps and disinfectants to be more effective against disease-causing microorganisms than plain toilet soaps. This is similar to findings by Shaheen et al. in Pakistan, who reported that 55% of study participants preferred to use antiseptic soaps and considered these products superior to plain toilet soaps and hand sanitisers.[8]

The use of antiseptic soaps and liquids for bathing in this study is noted in people of all ages but appears to

be significantly more common in females than in males. This may be attributed to the fact that women are generally more concerned about personal hygiene and appearance than men and are known to be more particular about skincare. [17]

The notion that antiseptic soaps and liquids are more effective at preventing skin and general infections was largely driven by adverts and marketing campaigns that influence personal opinions and family and friends. This claim is often used in television, radio and print adverts, and social media advertisements of various antiseptic manufacturing brands.[8,10,11] Shaheen et al. also reported that television commercials were the major influencing factor for use in his study population.[8] The option of being introduced to the use of disinfectant soaps and liquids by "self" which a majority of the respondents chose indicates their decision to use antiseptic soaps or liquids was not particularly influenced by any person, group or advert. It could be based on personal preference or the popular belief that antiseptic soaps and liquids kill germs and prevent infections.[7,8,11]

The use of antiseptic soaps and liquids is known to have some benefits. Studies have shown that they eliminate potentially harmful pathogens like Pseudomonas aeruginosa and Escherichia coli when used for handwashing.[7,11] They are beneficial in reducing Staphylococcus aureus overgrowth in patients with Atopic dermatitis.[16] Some are also used to manage certain infectious skin conditions, e.g. monosulfiram-containing soaps are effective in treating scabies.[18] However, many researchers have questioned the benefits of antiseptic soaps and liquids over plain soaps and have raised concerns about the long-term effects of these products.[2,6] A systematic review done by Aiello et al. did not find soaps containing 0.2%—0.3% triclosan at concentrations used in the community setting to be more effective at preventing infectious diseases or reducing bacterial levels on the hands than plain soaps.[6]

Furthermore, antiseptic soaps and liquids wipe out the normal skin flora, causing an imbalance of microorganisms and leaving the skin susceptible to opportunistic pathogens.[2,19] Mwambete et al. in Tanzania and Kaliyadan et al. in India both reported that most of the common antiseptic soaps, including those with triclocarban and chloroxylenol (PCMX/chloroxylenol), had sufficient anti-bacterial activity against normal bacterial commensals but minimal anti-fungal activity against fungal skin commensals like Candida and Malassezia species.[7 11] Hence the frequent use of some antiseptics could favour the overgrowth of fungal skin commensals like Candida and Malassezia species.[7,11,19] Thus, their widespread use may contribute to the high prevalence of superficial fungal skin infections such as candidiasis and pityriasis versicolor in Nigeria[20] and other African and Asian countries where household antiseptic soap use is common.[7,11,13,16,21] However, Dinkela et al. in Tanzania reported that both plain toilet soaps and triclosan-containing antiseptic soaps effectively reduced the burden of superficial fungal skin infections like tinea corporis, tinea capitis and tinea versicolor in school children and there was no significant difference between their efficacies.[21]

The elimination of normal flora, which are vital for normal skin barrier function, coupled with the irritant effect of the antiseptic agents, may be why they are associated with irritant and allergic contact dermatitis.[2,14,19,22] The high alkalinity of antiseptic soaps may also be a contributory factor as they are known to have pH ranges between 9 and 11, and although the high pH of these soaps contributes to their anti-bacterial properties, it also has an irritative effect on the skin barrier.[16,23] Furthermore, concerns about antimicrobial resistance resulting from the frequent use of antiseptics in humans and animals have been reported by some researchers.[12,15,19,24] Other studies from southeast Asia, for example, have also documented concerns that some antiseptic soaps can cause hormonal disruptions and other adverse systemic effects in humans and animals.[13,22] These concerns prompted the European Union and the FDA in the US to place bans on the sale and marketing for household use of several antiseptic agents in 2010 and 2016, respectively.[22,25]

The long and short-term risks of daily use of antiseptic soaps and disinfectant liquids are of greater concern when compared with the benefits they may confer. However, the general public is unaware of these risks as marketing and advertising campaigns for these products omit these risks, and medical

associations continue to endorse antiseptic soaps and disinfectants for personal hygiene.[10]

Conclusion

In this study, the household use of antiseptic soaps and disinfectant liquids is common in Lagos, Nigeria, with more than half of the population using them for their daily bath. This practice cuts across all ages but was more common in females. The major reasons for the use of these products identified were to kill germs and prevent infections. The decision to use them was largely influenced by personal opinion, adverts, and recommendations from health workers, family and friends.

Study Limitations

This study was conducted in an urban market; thus, the diversity of the demography may be limited. Other information like the presence of a skin condition in respondents and the source of bathing water, which may influence the use of antiseptic soaps or disinfectant liquids, was not included in the questionnaire and are also limitations of the study. Further studies on this subject should include such data.

Recommendation

More balanced public information and enlightenment on antiseptic soaps and liquids is required to prevent overuse which has been found to have untoward complications on skin health, general health, and the environment.

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Conflict of Interest

The authors have no conflict of interest.

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