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SKIN INFECTIONS AMONG INFANTS AND PARENTAL AWARENESS: IS THERE ANY RELATIONSHIP?

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Abstract
Introduction: In Mauritius, studies on skin problem are limited to adults only and no reports are available on skin health of infants and toddlers. The aim of this study is to determine the prevalence of skin problem among infants and toddlers and to investigate whether there is an association between socioeconomic status and education level of parents on skin problem of infants and toddlers.
Material and Methods: Survey data was collected from 500 parents that have children between the age of 1 month till 5 years. A questionnaire was distributed to elicit information on family history, socioeconomic and education details of parents, hygiene level and level of awareness of parents on skin problems and data was analysed using SPSS.
Results: Skin problems were mostly nappy rashes, eczema and skin rashes. Itching has been noted to be the most prevalent among infants and toddlers with a prevalence of 22%. Socioeconomic status and education level of parents have an effect on prevalence of skin problem. A high percentage of parents possess good knowledge on hygiene, risks factors and concern towards the skin health of the child.
Conclusions: There is a high prevalence of skin problem noted among infants and toddlers. Children having parents with low socioeconomic status and low education level have a higher incidence of skin problem. The majority of parents show high concern on skin health of their children.

Key words: prevalence; skin; infection; infants; toddlers; awareness level

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Introduction

Skin problem is a major health problem in the paediatric age group [1]. Several studies have been done across the world to determine factors that can have an impact on the prevalence of skin problem among paediatric age group. It is found that skin diseases contribute to the total morbidity presenting at different level of health and medical care [2]. Skin diseases form a substantial part (10-24%) of the total childhood morbidity that is encountered [3] and hence, the evaluation of skin disorders forms an important part of primary health care practice in case of children [4]. According to Mostafa et al. [5], the epidemiological data of skin infections provide us with information about prevalence, age and gender differences in affected groups and their regional distribution. In many parts of India, it has been found that the patterns of skin diseases are consequences of poverty, malnutrition, overcrowding, poor hygiene, illiteracy and social backwardness. As a result, status of health, hygiene and personal cleanliness of a society can be judged while assessing the prevalence of skin infections in children of the community [4].

It is also stated by World Health Organization 2005 [6] that a high prevalence rate of skin infections is strongly linked to low socioeconomic level where incidences of skin infections like climatic factors, poor hygiene, interpersonal transmission have been shown to be positive. Moreover, Mostafa et al. [5] postulated that genetic background, geographical area, climate, season, socioeconomic status, living conditions and medical resources are the most important factors that can result in an increase in the prevalence of skin infections. For instance, it has been demonstrated that good hygiene may prevent the occurrence of impetigo and social crowding may increase the risk of developing the disease [3]. Among these, Mostafa et al. [5] stated that the most frequent and prevalent skin infections in infants were bacterial skin infections (23.4%) which have also been attributed to hot humid and climate, overcrowding, low socioeconomic status and widespread use of tropical antibiotics leading to resistant strain.

Among the factors affecting skin infections, family size makes an important contribution. It is suggested by World Health Organization [6] that the occurrence of severe scabies epidemics increases in places like jails with close interpersonal contact. There is a high level of interpersonal contact in developing countries where households are often crowded [6]. In Egyptian villages studies were done that revealed that sharing bed among children is a factor that increases the prevalence of scabies in families [6].

Balai et al. [4] stated that the pattern of skin infections varies from country to country with pyoderma and malnutrition being more common in developing countries, while eczemas are more common in developed countries. This has been attributed to different climatic, cultural and socio-economic factors. As far as dermatoses in children are concerned, dermatoses are more influenced and are associated with socioeconomic status, climatic exposure, dietary habits and external environment [1]. Based on school surveys, Jain and Khandpur [1] stated that the prevalence of paediatric dermatoses in various parts of India ranged from 8.7% to 35%. The prevalence of dermatoses in children of school age ranged from 34% to 87.7% in developing countries whereas in countries such as Romania and Turkey, dermatoses accounted for 22.8% and 77% respectively [7]. The latter also showed that atopic dermatitis is more common in developed countries. This accounts for 25% to 33% of all consultations, followed by melanocytic nevi, (3% to 20%) and viral warts (5% to 13%). Concerning the level of awareness of parents on impetigo, a child with impetigo brings about attention, concern and inconvenience since children with impetigo are barred from schools and kindergartens [3].

In Mauritius, current data pertaining to skin problem are limited to mostly adults. There is no published data on the prevalence of skin problems in infants and toddlers.

The objectives of this study are as follows:

1) To investigate the prevalence of skin problems among infants and toddlers in Mauritius.

2) To determine any association between socioeconomic status and education level of parents on the prevalence of skin problem among infants and toddlers.

3) To assess the level of awareness among parents with respect to level of hygiene, nappy change, regular bath, use of products like cream and their concern to the skin health of the child.

Material and Methods

Participants: Using a stratified random sampling method, data was collected from 500 parents all around the island from different regions and occupational categories.

Inclusion criteria: The only inclusion criteria included those parents having one or more child/children of 1 month till > than 3 years up to 5 years.

Exclusion criteria: Children greater than 5 years were not taken into consideration and those suffering from any type of disease.

Settings: The survey was carried out in 2012 and 2013. The questionnaires were randomly distributed in day-care centres of children and pre-primary schools from all over the island. The parents were explained that all their answers will be dealt with strict confidentiality and the survey was strictly anonymous with no name and address of the participants. Appropriate informed consent was obtained from parents and all participants. Research was approved by appropriate Research Ethics Committee. Information sheet in which all details about the project, the participant's rights and the researcher's statement were enclosed, accompanied the questionnaire. The parents in the pre-schools and day-care centres were given verbal explanation in Creole, the most spoken language in Mauritius and as much time was allotted to them to answer the questions so that they could respond correctly.

Questionnaire design

Two questionnaires were used:

One of them dealt with:

a) Family history: Details of family history, the number of family members, the number of children in the family their specific age group;

b) Socioeconomic status: The total monthly family income, parental education attainment, parental care, mother's care;

c) Lifestyle and hygiene: The number of baths given daily, the types of nappies that were used and the number of nappies used daily. Questions on whether products like body lotion, powder and cream used were asked;

d) Awareness: The level of awareness of parents on regular bath, increase change of nappies, using products like creams, keeping the baby dry, sharing of infected towels. Open ended questions were asked on the precautions the parents usually take to prevent skin problems in their child.

The second questionnaire dealt with the Life Quality Index:

Questions on the dermatitis severity were asked, the degree of itching and scratching of the child and whether there has been effect of skin problem on his daily activities and life. A validated questionnaire based on DLQI (Dermatology Life Quality Index) (Lewis-Jones and Finlay, 2000) [8] was used. Prior permission from authors was obtained beforehand.

Results

Prevalence of skin problem and the relationship with sociodemographic factors

Figure 1 shows that 22% of infants and toddlers suffered from itching. 17 % from nappy rashes; 5% from eczema, 5% from skin problems other than itching, eczema and nappy rashes; 3% are from skin rashes.

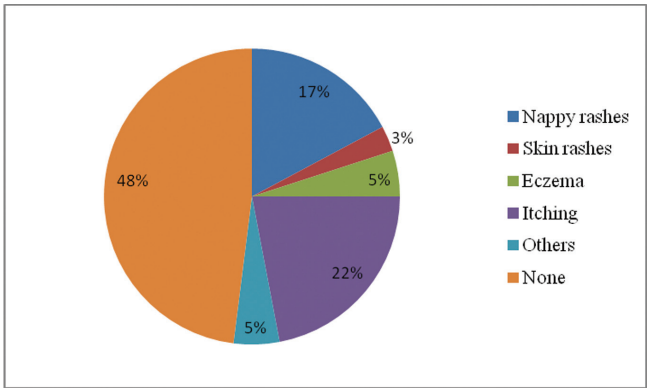

Figure 1. Percentage of children affected and the corresponding skin problem mostly observed.

It can be observed that in this study parents having a total monthly salary scale of < 500 USD have a high percentage (77.3%) of children who are affected with skin problem whereas, for those having monthly salary scale of 500-1000 USD, only 54% of children are affected. Parents that have total monthly salary scale of > 1000 USD, have children with less prevalence of skin problem (40.4%).

For nappy rashes, 54% of children come from family with a total monthly income of 500-1000 USD. 71% of children with skin rashes come from middle class family with a total monthly salary scale of 500-1000 USD. 56% of affected children with eczema come from family with total monthly salary scale of 500-1000 USD compared to that of low family income, where none comes from family with salary scale of < 500 USD. Similarly, 53% of affected children come from family with total monthly income of 500-1000 USD compared to 13% that come from family with a total monthly salary scale < 500 USD. There is a positive correlation (r =0.251) showing that there is a link between total monthly family income and children being affected with skin problem (Fig 2).

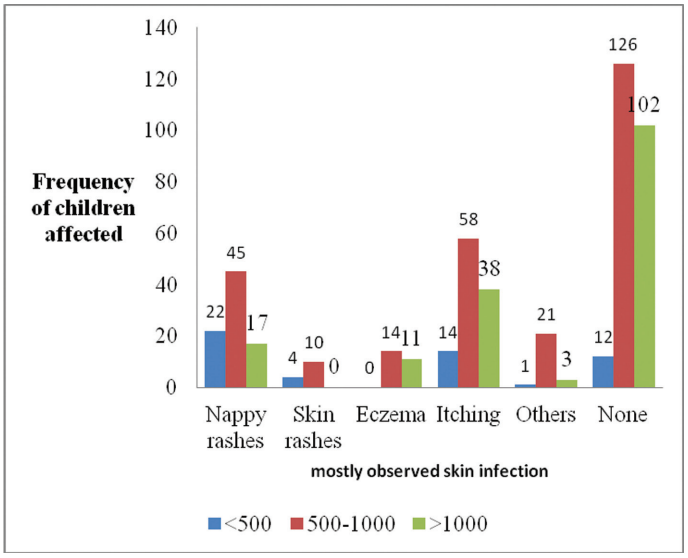

Figure 2. Frequency of children affected with skin problems and the corresponding total monthly salary scale of parents (USD).

For children having parents with no formal education level, it can be seen that there is a high prevalence (100%) of children being affected with skin problem while parents that have studied till primary level, 79% of children are affected with skin problems. Parents who have studied till secondary level have 60% children that are affected with skin problem while those who have studied till tertiary level show less prevalence of (44.8%) of skin problem. However, it should be mentioned that out of 500 participants interviewed, 308 children have parents that are tertiary education holders. The correlation coefficient is 0.099 nearly 0.1, showing a positive relationship between education level and number of children affected with skin problem. However, the relationship is rather weak as the coefficient is of low value (Tabl. I).

Level of education	% children affected with skin problem	% children not affected with skin problem
None	100	0
Primary	79.0	21
Secondary	60	40
Tertiary	44.8	55.2

Table I. The level of education of parents and % of children affected with skin problem.

Prevalence of skin problem with relation to hygienic practices and level of awareness of parents

Results indicate that the majority of children have 2 baths per days but still have a high frequency of skin problem. Even those who did not have skin problem also have 2 baths a day. There is no statistical significant difference and also no relationship between the number of baths and mostly observed skin problem (p value=0.356) (r= 0.041). A high prevalence (65%) of the Mauritian population strongly agrees on the fact that increase use of nappies helps to decrease skin problem while 29% of Mauritian population only agree to the increase use of nappy change. Hence, majority of the parents are conscious on the increase use of nappies

A high prevalence of the Mauritian population (52%) strongly agrees on the use of products like powders and lotion that contributes in the decrease of skin problem. 35 % of parents only agree on the use of products like powders and lotion that helps in the decrease of skin problem.

A high prevalence of Mauritian population (62%) strongly agrees on the use of towels to dry a child can help to decrease skin problem while only 1% of the population has a disagreement over the use of towels. A high prevalence of parents (94%) is aware of the fact that sharing of infected towels may contribute to skin problem in children.

Among the population, 80% of parents are very much concerned on the skin health of their child, while the rest 20% are only concerned.

Quality of Life Index : Assessment of dermatitis severity of children

45% of parents admitted that that there has been no dermatitis severity on the children. 4% of extremely severe cases have been reported among children (Tabl. II)

52% of infants and toddlers have been scratching and itching a little only as compared to 40% who have not been scratching. Only a little (8%) have been scratching a lot. According to the figure 5,45% of children show a slightly fretful mood while 40% show a happy mood.

	Frequency	Percent	Valid Percent	Cumulative Percent
Extremely Severe	11	2.2	4.3	4.3
Severe	10	2.0	3.9	8.2
Average	58	11.6	22.7	31.0
Fairly good	61	12.2	23.9	54.9
None	115	23.0	45.1	100.0
Total	255	51.0	100.0	

Table II. Frequency of children and the corresponding dermatitis severity level.

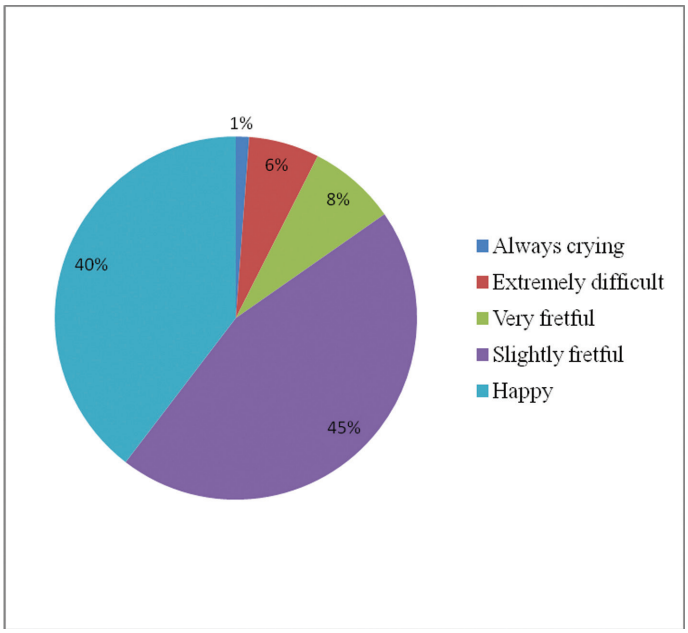

Figure 3. Percentage of child's mood affected by skin problem.

Discussion

Given the increased prevalence of skin problem in many developing countries and the lack of published data pertaining to the prevalence of skin problems among infants in Mauritius, this study was done in order to investigate the prevalence of skin problems among infants and toddlers and assess the level of awareness among parents.

Prevalence of skin problems and sociodemographic factors

48% of the Mauritian population is not affected by any skin problem. The remaining 52% of the population suffer from the following: itching (22%), nappy rashes (17%), eczema (5%), others (5%) and skin rashes (3%) (Fig.1). Studies in Ethiopia have shown similar frequencies. Oyedeji et al. [9] reported a prevalence of 49.2% of skin problem. In other countries, however, the prevalence of skin problem has been lower. For instance, in Iraq, the overall skin problem is reported to be 40.9%, Jordan (19.3%), Malaysia (34.4%) and Nigeria (35.2%) as outlined in [10].

In Mauritius, itching has been observed to be the most common with a percentage of 22% while in countries like Nigeria, impetigo was observed in a higher prevalence (19.4%) [9]. Studies from Uttar Pradesh, India have shown that in children less than 14 years, pediculosis capitis (22.6%) was the most common dermatosis [1]. Itching as reported in this study, is mostly due to mosquito bites that cause inflammation and redness on exposed areas such as hands and forearms, ankles and neck.

Wenk and Itin [2] revealed that in Switzerland, atopic dermatitis was the most common dermatosis in all age groups, with the highest prevalence (33.5%) in the infant group followed by hemangioma (7.5%) and eczema (4.1%) which were the second and third most common skin disorders in infants. This study also shows that the frequency of occurrence of eczema (5%) is quite similar to that reported in Switzerland whereas nappy rash (17 %) is the second most common skin problem [2].

The impact of socioeconomic status of parents on the prevalence of children was also assessed. Parents having total monthly family income of less than (<500 USD) have a high prevalence of skin problems (77.3%) as compared to 54% from those with a monthly middle class income (500-1000 USD) and 40.4% respondents from the high monthly income category (> 10000 USD) had skin problems. A higher frequency of skin problems among low socioeconomic status is quite well documented. This finding is in line with other studies where the majority of skin problems were observed in families with low occupation group [9]. The latter reported 43% skin problem among low socioeconomic status as compared to 22.5% among high social class. Results indicate that there is a significant difference but positive relationship between total monthly family income and children having skin problem. Other studies have demonstrated an association between socioeconomic status and poor skin health of children. Ete-Rasch [11] stated that socioeconomic factors for example unemployment and low income are risk factors that have a negative impact on children's health. In Iraq, a high prevalence of skin problems was reported in regions of low socioeconomic status [10]. One major explanation for the association between income and child health is that families with a high income are able to provide their children with more goods, services and resources that can benefit their children and prevent them from experiencing adverse health outcomes [12].

An association of level of education of parents on prevalence of skin problem is also well documented. Parents who have no formal school education level at all have the highest prevalence of skin problem (100%) while primary education holders have 79 % children being affected. Less percentage (60%) of affected cases is seen with parents that have studied till secondary level while the least prevalence (44.8%) is observed in parents with tertiary education. hese findings are consistent with other studies that state that high prevalence of skin problems are due to poor parental supervision, child neglect or ignorance [9] and these can be judged by parents who were illiterate and have no education attainment [9]. Correlation between education level of parents and prevalence of skin problem has shown there is statistically significant difference between the two variables with a very weak positive relationship between education level of parents and occurrence of skin problem. Ete-Rasch [11] postulated that poor parental education attainment and low occupation group are associated with a high prevalence of skin problems. However, this is not always the case as children of highly educated parents may be more prone to an irritating skin disorder than those from less educated families [13]. The authors tried to explain this discrepancy with the "hygiene hypothesis" which states the fact that some educated parents provide a germ free environment for their child, hence, they are less prone to problems. As a result, following the "hygiene-hypothesis" theory, they have an improperly trained immune system due to less exposure to pathogenic agents [13]. This hypothesis suggests that if the environment is "too clean" the immune system will not mature properly and may not react properly while encountering germ [14].

Relationship between hygiene level and parental awareness on the prevalence of skin problems

Nappy rashes were linked to level of hygiene [15]. 43% of children suffering from nappy rashes use four nappies daily while only 2% of children use two nappies daily. Results also indicate that the majority of children use four nappies on a daily basis and this category has a higher frequency of nappy rash conditions. A high prevalence (65%) of the Mauritian population strongly agrees on the fact that increase use of nappies helps to decrease skin problems. Despite this, high prevalence of nappy rashes is observed in children using more nappies. Contradictory to what has been observed in the study, Borkowski [16] stated that entailing frequent diaper changes is an ideal way for both treating and preventing nappy rashes.

It should be noted that while doing the survey many parents cited the importance of keeping the children dry, that is without nappies for some time during the day to prevent nappy rashes. Many parents acknowledged that using products like creams and powders and the most common one is sudocream (15.25% zinc oxide). The baby powder and lotions act as barriers between the skin and the diaper, hence, block the moisture and help in producing some degree of lubrication [15].

It has been shown that a high prevalence of the Mauritian population (52%) strongly agrees on the use of products like powders and lotions that help to decrease the occurrence of skin problem. During this survey, it has been found that most parents use moisturizing cream. According to Larson [17], moisturizing is beneficial for skin health and reducing microbial dispersion from the skin. The majority of children are given baths twice daily.

Among children affected with skin problem, the highest frequency of children take two baths daily but number of baths do not have any effect on the frequency of skin problem. Moreover, there is a weak positive relationship between the two variables (r =0.041). Furthermore, a high prevalence of parents (94%) is aware that the fact that sharing infected towels may contribute to skin problems in children.

Life Quality Index

Skin diseases are known to have major impact on the lives of patients and the families and several validated patient completed questionnaire have been used to assess its impact Basra et al. [18]. While assessing the dermatitis severity of the child in the Quality Life Index [8], it has been found that a low percentage of children (4%) shows extremely severe dermatitis while the majority of children (45%) are not affected at all. This can be attributed to the prompt treatment given to the child as most parents are very much concerned of the skin health of the child. As far as the reaction of parents on skin problem of the child is concerned, 80% of parents are very much concerned on the skin health of their child. Only 20% affirmed to be concerned only. Hence, Mauritian parents are well informed of skin problems and the level of awareness is high which results in proper skin care of the child. Amoran et al. [19] reported school children sought low level of medical care due to the assumption that skin diseases are not important and not merit any treatment. Another part of the Life Quality Index was the nature of the frequency of itching and scratching whereby 52% of the population has been scratching and itching a little. A high prevalence (22%) of the infants and toddlers suffered from itching. This is due to tropical climate (25-33 degrees Celsius) prevailing in Mauritius and many respondents reported mosquito bites as the major cause of itching. The Life Quality Index also investigated the mood of the child under criteria like, always crying, extremely difficult, very fretful, slightly fretful and happy. 45% of the children have a slightly fretful mood while 40 % show a happy mood. Hence, the mood of the child is slightly affected due to skin problems.

Conclusion

More than half of the participants suffer from skin problems with itching and and nappy rashes were more common. Those infants and toddlers from low socioeconomic status were more prone to skin problems. Parents with low level of education have children with more skin problems. Parents have a high level of awareness on hygienic practices. Skin problem has little impact on quality of life of children.

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