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RESEARCH ARTICLE

SKIN DISEASES AMONG FARMERS IN RURAL AREAS OF A COASTAL BLOCK, EASTERN INDIA

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ABSTRACT

Skin diseases among farmers is usually under reported and it is ignored by farmers as most of them consider it as "part of their job". Skin being the most exposed organ while farming, the farmers are predisposed to skin diseases among other health hazards.

Objective: This study aims at finding out the prevalence of skin disease and associated risk factors among farmers.

Methodology: Multistage cluster random sampling using PPS (Probability Proportional to Size) was used to select farmers in a coastal block of Odisha. A total of 200 farmers were selected for the study. Complete dermatological examination was conducted in a well lit area.

Results: The prevalence of skin diseases was found to be 63% among farmers in rural settings. The common skin diseases reported among pesticide handlers were hyperkeratosis, paronychia, fungal infections, nail dystrophy, dermatitis, melasma, freckles, PLE and others. Lower socioeconomic status, illiteracy, longer exposure to pesticides, non usage of PPE were found to be risk factors for skin diseases among farmers.

Conclusion: Health education among the farmers along with appropriate PPE should be encouraged to prevent skin diseases in this group of population. An integrated approach and further research is required to find out a casual association between different risk factors and skin diseases among farmers.

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INTRODUCTION

Agriculture is a vital part of both the economy and the health of consumers, and the health and productivity of farmers ultimately affects everyone. The rural areas of Odisha are dominated with 85% population. Agriculture provides 73% of the total work force belonging to cultivators and agricultural laborers and contributes 30% of the net domestic product of the state. According to ILO, the agriculture sector is exposed to health hazards to a great extent (Shenoi *et al.,* 2005). Agricultural workers engaged in outdoor activities are exposed to large number of health problems in the form of physical factors like extreme weather conditions, sunrays, long working hours, etc; chemical, toxicological hazards in the form of exposure to pesticides/fertilizers. Skin is the most exposed organ while spraying the pesticide on fields (Spiewak, 2001). Skin diseases among farmers are often underreported because their association with the workplace is not recognized (Washington, 1998). There is paucity of data on skin diseases among famers in the state of Odisha, particularly in the coastal areas, where farming is widely practiced.

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Objectives

To estimate the prevalence of common skin diseases among agricultural farmers in rural areas of a coastal block of Odisha, Eastern India and to assess the associated risk factors for skin diseases among them.

Ethical consideration

No ethical issues. Ethical clearance was sought from the institutional ethical committee.

MATERIALS AND METHODS

The present study was conducted among famers in the Krushna Prasad block of Puri district from October 2015 to July 2016. Farmers aged >18years involved in farming for more than a year and a permanent resident of the study area and who give consent to participate were included in the study. Sample size was estimated, assuming skin disorders comprise 50% of all occupationally related diseases based on previous studies (Shenoi *et al.,* 2005; Adram *et al.,* 1983). With confidence interval at 95%, allowable error of 10% and design effect 2, sample size calculated was 200.

Multistage cluster random sampling was adopted in the study. Cluster random sampling using PPS (probability proportional to size) was used in identifying twenty villages, out of 43 villages in the block. From each village, households were selected using simple random sampling to reach the sample size. Households were visited up to two times if the eligible participant was found absent during the first visit. House to house survey was conducted by the investigator and the team in the selected villages. The local health worker/ASHA whosoever present was contacted and fixed days of the week were chosen so that the survey could be carried out smoothly. Usually the study was conducted during the afternoon hours when the farmers were available. Information was elicited on socio demographic characteristics, details of farming, pesticide use, pattern of PPE use. Complete dermatological examination was conducted in a well lit area. Skin diseases and their pattern was diagnosed by trained doctors according to clinical presentation and morphology of lesions. Socioeconomic class was elicited using B.G Prasad scale. Data was entered in Microsoft Excel and analyzed using Epi Info.7. Data were analyzed by using descriptive statistics, viz. percentages and the inferential statistics using Pearson's Chi Square test. P <0.05 was considered to be statistically significant.

RESULTS AND DISCUSSION

Table 1 shows the socio demographic profile of the farmers. In the present study, it was found that the age-sex distribution of farmers is maximum in the age group of 40-60 years i.e. 65.5%. The mean age of the farmers was found to be 47 ±10.4 years. Similar age distribution was found in another cross sectional study among farmers of Kangrali village in Belgaum, by Ravi *et al.,* (2014). A study conducted in rural areas of Ahmednagar district of India found different results as compared to the present study where majority belonged to age group 31-40 age group (Bhoopendra and Mudit, 2009). This difference might be due to differences in the distribution of population in their area. All the farmers in the present study were Hindus. Majority, 55% were from general category, 31.5% were scheduled tribes and only 13.5% belonged to other backward class. Similarly, a majority of farmers were illiterate i.e. 61% and 39% were literate. Farming being the most common occupation in rural areas of India, farmers are engaged in it from a very early age, thereby being devoid of schooling and formal education.

On assessing the socioeconomic status, it was found that 41% farmers belonged to lower socioeconomic class with monthly per capita income below Rs 843/-. 40% of farmers were from lower middle class with per capita monthly income of Rs 843-1684 and the rest 19% were from middle socioeconomic class with per capita monthly income of Rs 1685-2807. Table 2 shows the prevalence of different types of skin diseases among farmers according to gender. In the present study, it was found that the overall prevalence of skin diseases was 63%. The prevalence of skin diseases among male farmers was 63.4% and among female farmers it was 62.1%.Similar result was found in a study among paddy field worker, where the prevalence was found to be 73% (Sameer Abdulla Al-Haddad and Adel Salman Al-Sayyad, 2013). The prevalence of different types of skin diseases were as follows: The most common skin diseases among the farmers was hyperkeratosis with a prevalence of 39.5%.It was also found that hyperkeratosis was the most common skin diseases in males(40.3%) as well as females(37.9%). The prevalence of other common skin diseases were nail dystrophy (31.5%), fissuring of skin (29.5%), acne (29%), paronychia (21.5%), dermatitis (21%). The prevalence of pitted keratolysis was 19.5%, followed by freckles (13.5%), PLE (10.5%), melasma (7.5%). The skin diseases with lesser prevalence were papules (2.5%), frictional callosity (1%) and non specific rash (1.5%). Fig 1 shows the distribution of skin lesions on face. The skin lesions on face were mostly pigmentary or photo induced lesions. The most common lesion on face was acne 29%, followed by PLE (10.5%), melasma (7.5%) and freckles (2.5%). Fig 2 shows the distribution of different skin lesions in the upper and lower extremity. On the basis of symptoms and dermatological examination of the farmers, it was found that the most common skin lesions in the upper extremity could be categorized into three types: Infections, Dermatitis and Keratinization defects. The common lesions were hyperkeratosis 21%, nail dystrophy 19.5 %, palmar fissuring 7.5%, paronychia 6%. Hyperkeratosis could be attributed to the manual work among farmers. The causes of large proportion of nail dystrophy could be fungal infection or due to occupational trauma. Similar findings were noted in a study by Tosti *et al.,* 2002. Tine versicolor, a superficial fungal infection was seen in 12.5% farmers in the upper limb. This infection seems to prefer hot and humid climate of coastal areas (Halder *et al.,* 2003). Hand dermatitis was found in 9.5% farmers. A cross sectional study among agricultural fruits farmers in Southern Taiwan, 122 farmers were clinically examined and 30% of farmers had dermatitis (Guo *et al.,* 1996). The difference in findings could be because the latter was conducted only among fruit farmers. Papules were found in 2.5% of farmers. Many crops can traumatize the skin by their thin pricky spikes or by laceration. They can produce urticarial papules in farmers handling crops.

Similarly on examination of lower extremity, it was found that traumatic and frictional reactions like hyperkeratosis 27%, plantar fissuring 26.5%, paronychia 17.5%, nail dystrophy 17% and pitted keratolysis 13.5% were common in the lower limb. Other lesions found were foot dermatitis 12%, Tinea versicolor 4% and non specific rash 1.5%.Only two cases of frictional callosity were found. Table 3 shows the association between different variables and skin diseases among farmers. It was found that the prevalence of skin diseases was little higher among male farmers 63.4% (85 out of 134) than females 62.1% (41 out of 66). When the association between skin diseases and gender was interpreted, it was found that the association was not significant (p=0.8). The equal susceptibility of farmers of both gender to skin diseases could be due to the equal exposure to agricultural activity in a rural setting. It was also found that, out of the literate farmers, about 42.3% were having skin diseases and among illiterates 76.2% were having skin diseases. The association between skin diseases and literacy status of farmers was found to be statistically highly significant (p<0.0001). Similarly, it was found that the prevalence of skin diseases was highest (72%) among farmers belonging to lower socioeconomic class, followed by lower middle class (62.5%) and 44.7% among farmers belonging to middle socioeconomic class. The findings show that the prevalence of skin diseases among farmers was increasing with decrease in socioeconomic class. The association between skin diseases and socioeconomic class was found to be statistically significant (p=0.01). This could be due to the fact that poor housing and living conditions which prevail among people in the lower socioeconomic section act as contributory factors in skin diseases.

Table 1. Socio demographic profile of farmers, N =200

Variables	Male (n=134)	Female (n=66)	Total (N=200)
AGE GROUP (YEARS)		Number (Percentage)	
18-40	20(14.9)	13(19.7)	33(16.5)
40-60	91(67.9)	40(60.6)	131(65.5)
≥60	23(17.2)	13(19.7)	36(18)
CASTE			
General	74(55.2)	36(54.5)	110(55)
Other backward class(OBC)	17(12.7)	10(15.2)	27(13.5)
Schedule tribe	43(32.1)	20(30.3)	63(31.5)
LITERACY			
Literate	49(36.6)	29(43.9)	78(39)
Illiterate	85(63.4)	37(56.1)	122(61)
SOCIO ECONOMIC CLASS (Per capita monthly income)			
Lower (Below Rs 843)	73(54.5)	9(13.6)	82(41)
Lower middle(Rs 843-1684)	41(30.6)	39(59.1)	80(40)
Middle(Rs 1685-2807)	20(14.9)	18(27.3)	38(19)
Total	134(67)	66(33)	200

Table 2. Prevalence of skin diseases among farmers according to gender, N =200

Variables		Male (n=134) Number (%)	Female(n=66) Number (%)	Total (N=200) Number (%)
Total Prevalence of Skin Diseases		85(63.4%)	41(62.1%)	126(63%)
Sl no.	Different skin diseases*			
1.	Paronychia	30(22.4%)	13(19.7%)	43(21.5%)
2.	Tinea Versicolor	20(14.9%)	13(19.7%)	33(16.5%)
3.	Pitted keratolysis	22(16.4%)	17(25.7%)	39(19.5%)
4.	Dermatitis	30(22.4%)	12(18.2%)	42(21%)
5.	Hyperkeratosis	54(40.3%)	25(37.9%)	79(39.5%)
6.	Fissuring	35(26.1%)	24(36.4%)	59(29.5%)
7.	Nail dystrophy	42(31.3%)	21(31.8%)	63(31.5%)
8.	Acne	35(26.1%)	23(34.8%)	58(29%)
9.	Freckles	18(13.4%)	09(13.6%)	27(13.5%)
10.	Melasma	05(3.7%)	10(15.1%)	15(7.5%)
11.	PLE	15(11.2%)	06(9.1%)	21(10.5%)
12.	Frictional callosity	02(1.5%)	-	02(1%)
13.	Papules	03(2.2%)	02(3%)	5(2.5%)
14.	Non specific rash	02(1.5%)	01(1.5%)	3(1.5%)

*Multiple responses

Table 3. Association between skin disease and different socio demographic variables

Sociodemographic variables	Skin disease present (no.)	Percentage (%)	Chi square value	P value
Gender				
Male	85	63.4	0.03	0.8
Female	41	62.1		
Literacy				
Literate	33	42.3	22.05	<0.0001
Illiterate	93	76.2		
Socio Economic class				
Lower	59	72	8.26	<0.05
Lower Middle	50	62.5		
Middle	17	44.7		
Years of farming				
<10years	5	23.8	15.26	0.0004
10-20years	60	69		
>20years	61	66.3		

Table 4. Association between skin disease among farmers handling pesticides and duration of use and PPE usage

Variables	Skin disease present (no.)	Percentage (%)	Chi -square value	P value
Pesticide use				
Yes	91	60.3	1.53	0.21
No	35	71.4		
Years of pesticide exposure				
<8 years	5	23.9	24.1	<0.0001
8 -10 years/day	30	50.8		
>10 years/day	56	78.9		
Hours of Pesticide exposure			9.18	0.004
<5hours/day	21	42.9		
>5hours/day	70	68.6		
Usage of PPE				
YES	22	37.3	19.8	p<0.0001
NO	69	75		

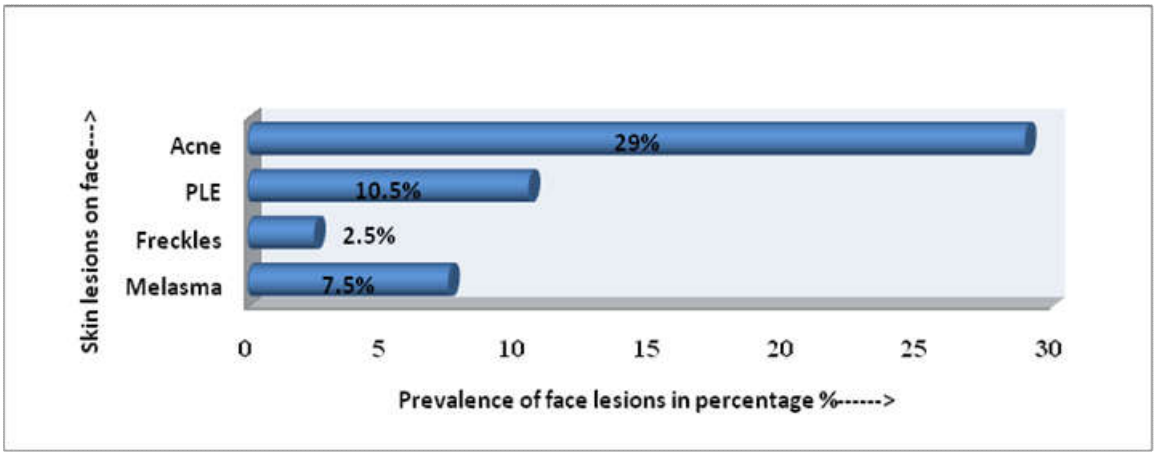
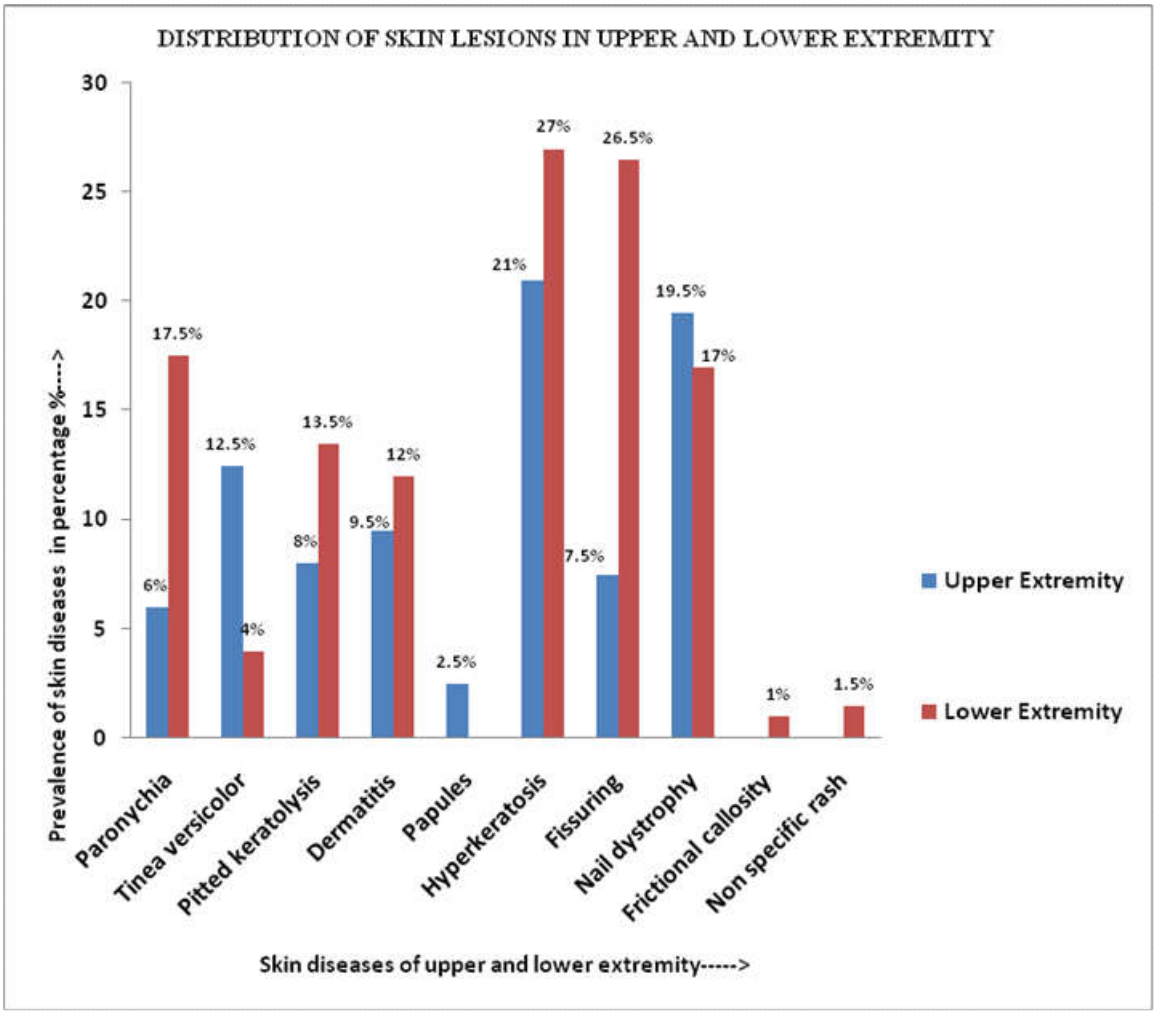


Fig. 1. Distribution of skin lesions on face



The prevalence of skin diseases was lower among those farmers who were involved in farming for < 10 years as compared to those who were involved in farming for >10 years. This difference was found to be statistically highly significant (p = 0.0004). As shown in Table 4, in the present study, 75.5% i.e. 151 out of total 200 farmers were involved in pesticide handling. Among the pesticide handlers, 60.3% had skin diseases. It was also found that, among the pesticide non handlers, 71.4% had skin diseases. The association between skin diseases and pesticide handling was found to be statistically not significant (p =0.21).

When the association between skin diseases and duration of pesticide handling in years was interpreted, it was found, with increase in years of pesticide handling, there was an increase in prevalence of skin diseases. The findings of the study suggest that the association between years of pesticide handling and skin diseases was highly significant (p<0.0001). The association between skin diseases and hours of pesticide handling was found to be statistically significant (p =0.004). The findings of the present study, shown in Table 4 indicate that effect of pesticide on skin is time dependant. This is in accordance with other studies which have reported a time

dependant effect of pesticide on skin (Kishi *et al.,* 1995). In the present study, majority of pesticide handlers 60.6%, were not using the recommended protective gears. A study carried in Western Uttar Pradesh showed majority 34% of respondent had used mask/hand gloves and 81% were using mask followed by 67% who used gloves (Mantesh, 2009). Other similar studies conducted in Cambodia, Palestine and Bolivia revealed that majority 90% had used mask as Personal protective equipment (PPE) which was similar to present study (Manwani and Sachin, 2013). Few findings of the present study were not similar to the studies conducted in Cambodia, Nepal and Bahrain which showed majority of the respondents were using aprons as Personal protective equipment(PPE) and rest of them did not use protection (Hanne Klith Jensen, 2011). As shown in Table 4, it was found that among the PPE users, 37.3% were having skin diseases and 75% of PPE non users were having skin diseases. The association between skin diseases and PPE use was found to be statistically highly significant ($p<0.0001$). This indicates the use of PPE while using pesticides can reduce the burden of skin diseases among farmers.

Conclusion

The findings of the present study estimated the prevalence of skin diseases to be high i.e. 63% among the famers in rural settings. The common skin diseases reported among farmers were hyperkeratosis, paronychia, fungal infections, nail dystrophy, dermatitis, melasma, freckles, PLE and others. Lower socioeconomic status, illiteracy, longer exposure to pesticides, non usage of PPE were found to be possible risk factors in causation of skin diseases among farmers.

Recommendations

Information on common skin diseases among farmers should be properly informed. Since majority of farmers in rural setting are illiterate and of low socioeconomic status, different schemes should be introduced for addressing the issues. Provision of better quality seeds, non toxic pesticides and up gradation of traditional skills in farming should be promoted. Immediate attention should be given to implementation of proper awareness programs for farmers regarding pesticides, their impact on human skin, their storage and usage of safety measures to be practiced while handling, like protective clothing, nose cover, gloves, facial masks and boots etc. Further study should be conducted for suitable protective clothing/gears for farmers subject to the terms and conditions of different parts of the country. Therefore, an integrated approach as suggested will go a long way in combating the problem of higher prevalence of skin diseases amongst farmers.

Conflict of interest: The authors declare that they have no conflict of interest.

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