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Prevalence of skin problems and its health impact among adolescent school children in Majmaah, Saudi Arabia

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ABSTRACT

Background: Adolescents suffer the consequences of sudden spurt in their growth and development and one of them is the multitude of skin disorders. This creates a sense of physiological and psychological insecurity which hinders their day to day activities including academic progress. Skin disorders can range from acne, allergic reactions, and frequent infections to certain dermatological diseases. A study on the association of skin disorders and its psychological and physiological consequences was a felt need among adolescent school going children. *Objectives:* To study the prevalence of skin problems and its health impact among adolescent school children. To give recommendations based on the outcome of the study. *Methodology*: This is a cross-sectional observational study done on adolescent school children in Majmaah, Saudi Arabia. A pre-tested, close ended interviewee-based questionnaire was used to collect the data and analyze the information. *Results*: Most of the adolescent participants had skin disorders like acne (32.4%), dandruff (21.8%), dry skin (16.2%) and oily skin (14.6%). The associated problems for children that were prominent were itchy and scratchy skin (36.9%), being self-conscious and embarrassed (7.9%), not able to play certain sports (7.4%) and attending school regularly (6.2%). *Conclusion*: Prevention of skin disorders through health education, regular health checkup, proper diet and exercise would help in reducing the associated physiological and psychological health problems among the adolescent population.

Keywords: skin disorders, Adolescents, school children, psychological problems, social problems, Saudi Arabia

1. INTRODUCTION

Low socioeconomic status, malnutrition, overcrowding, and poor standards of hygiene are important factors accounting for the distribution of skin diseases among children and adolescents worldwide, particularly in developing

countries (Dogra & Kumar, 2003). The International Classification of Disease 10 classification of human disease lists more than 1,000 skin or skin-related illnesses, a pattern dominated by a few conditions accounting for most of the skin disease burden. Yet despite this profound impact, skin disease continues to receive relatively little attention in the national or global health debate. Acne and fungal skin conditions was on the top ten most common skin diseases worldwide (WHO, 2005). We know very little about the magnitude and burden of skin disease among children at a population level. Such knowledge forms an essential step in a population-based needs assessment (Stevens & Gillam, 1998).

In one study, nine skin conditions, pityriasis alba (57 cases), keratosis pilaris (45), warts (31), atopic dermatitis (27), insect bites (25), urticaria (21), irritant dermatitis (18), other forms of dermatitis (seven) and multiple atypical naevi (five), accounted for 80% of the total sample (Popescu et al., 1999). Similarly, several studies conducted in African countries have reported high prevalence of skin diseases among schoolchildren (Ogunbiyi, 2004; Mahe & Hay, 2005). Risk factors associated with skin diseases range from dry skin, unhygienic habits, chronic diseases and unhealthy lifestyle. Among adolescents, the sudden increase in the production of hormones and a growth spurt also may lead to certain skin disorders.

Adolescence is characterized by sensitivity to issues of attractiveness. With dermatologic conditions, this may adversely affect early detection and compliance (Bahamdan et al., 1999). In one study done in Saudi Arabia, 37% had one of the dermatitis or eczema group of diseases, 12.75% had acne, 7% had vitiligo, 5.9% had viral infections 5.6% had superficial mycoses, 5% had bacterial infections, 1.51% had psoriasis and only 1.1% had lichen planus (Shelleh & Al-Hatiti, 2004). Another study found that the top five skin diseases were eczema/ dermatitis (19.5%), viral infections (16.6%), pilosebaceous disorders (14.4%), pigmentary lesions (11.2%) and hair disorders (7.6%). Among the major disorder in males were viral skin infections (20.0%), while eczema/dermatitis (20.7%) constituted the most prevalent skin disease in females (Al Shobaili, 2010).

A study in the eastern province of Saudi Arabia observed that the majority of childhood skin diseases in SA may be grouped into relatively few diagnostic categories including eczema, infections and pigmentary disorders (Saif & Al Shehab, 2008). An epidemiological study done in Majmaah in 2012 found that eczema was the most frequent diagnosis among all skin diseases and parasitic infections were the least frequent diseases (Al-Hoqail, 2013). Studies of skin disorders and its risk factors among adolescent or school children are still in an early stage in this region. A need was felt to assess the prevalence of skin disorders among the adolescent age group which is a dynamic population both in terms of physical growth and mental development.

Objectives

General objectives

To study the prevalence of skin problems and its health impact among adolescent school children

Specific objectives

To find out the prevalence of common skin problems among adolescent school children

To study the risk factors associated with the skin problems

To assess the psychological impact associated with the skin disorders

To recommend ways and means to reduce the risk factors and skin problems among the adolescent population

2. METHODOLOGY

Study design

This is an observational, cross – sectional study

Study setting

The study was conducted among adolescent school children in higher secondary schools of Majmaah, Saudi Arabia.

Target population

The sample population was the adolescent male and female students studying in the higher secondary schools in Majmaah during the data collection period. All the students aged more than 10 years and less than 19 years was included in the study.

Sample size

Using the formula for calculating the sample size (Cochran, 1977) as given below the total sample would be around 350 (175 males and 175 females):

$N = z^2 * p(1-p)/d^2$

z (Confidence level) = 1.96, p (prevalence of skin disorders) = 0.35, d (Confidence interval) = 0.05

Duration of the study

The study was carried out during the period from 1 December 2019 to 1 December 2020.

Sampling technique

Cluster sampling was done to choose 5 schools (males and females) from which stratified sampling with proportional allocation were done to choose male and female students from the available sampling frame.

Data collection

Pre-structured, pre-validated questionnaires were used to gather demographic and variable data from the students. The students were instructed to fill up the forms with the assistance of their parents and bring it back to school the next day for submission to the field investigator.

Data analysis

All the data was entered into the statistical software SPSS version 25.0 and tests of significance was used to find out the association between risk factors and diseases. Also, the effect of the skin disease on the student's health was analyzed and statistical tests applied accordingly.

Inclusion and exclusion criteria

All the male and female students within the age group 10 – 19 years as defined for adolescent group by World Health Organization was included in the study sample.

3. RESULTS

Figure 1 shows the distribution of the participants according to age and gender. The participants (males and females) were between 12 years and 19 years of age. Most of the participants are in the 14 – 18 years age group. Table 1 show that 18.6% of male students had acne which was more than in females (13.8%). This was statistically significant ($p<0.05$). Again, a greater number of male students (4.3%) were suffering from dermatitis than females (2.4%).

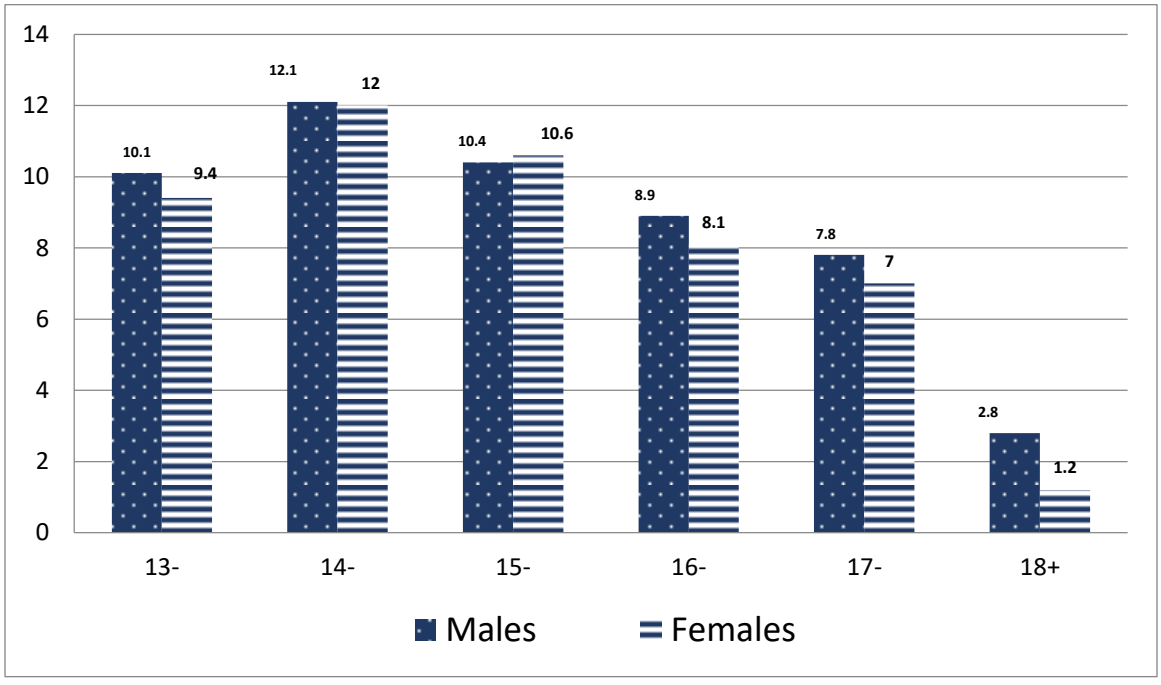

Figure 1 Percentage distribution of the age groups and sex of the studied students

Similarly, dry skin problem was more among the male students (9.0%) than the females (7.2%). Male students complained of having skin infections (1.6%) while none of the female had any similar complaints which was statistically significant ($p<0.05$). Interestingly, a significantly high ($p<0.00$) percentage of male students (14.2%) complaint of suffer from dandruff than females (7.6%). Lastly, 8.0% of the male students were suffering from oily skin problem as compared to 6.6% of females which was not statistically significant.

Table 1 Prevalence of common skin disorders among the male and female school children

Skin conditions		Gender		Total	P value
		Male	Female		
Acne	Yes	139 (18.6%)	103 (13.8%)	242 (32.4%)	$X^2 = 4.23$ P = 0.04
	No	250 (33.4%)	256 (34.2%)	506 (67.6%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Dermatitis	Yes	32 (4.3%)	18 (2.4%)	50 (6.7%)	$X^2 = 3.09$ P = 0.079
	No	357 (47.7%)	341 (45.6%)	698 (93.3%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Dry skin	Yes	67 (9.0%)	54 (7.2%)	121 (16.2%)	$X^2 = 0.655$ P = 0.418
	No	322 (43.0%)	305 (40.8%)	627 (83.8%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Skin infection	Yes	12 (1.6%)	0 (0.0%)	12 (1.6%)	$X^2 = 4.23$ P = 0.04
	No	377(50.4%)	359 (48.0%)	736 (98.4%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Dandruff	Yes	106 (14.2%)	57(7.6%)	163 (21.8%)	$X^2 =$ 14.167 P = 0.00
	No	283 (37.8%)	302 (40.4%)	585 (78.2%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Oily skin	Yes	60 (8.0%)	49 (6.6%)	109 (14.6%)	$X^2 = 0.473$ P = 0.492
	No	329 (44.0%)	310 (41.4%)	639 (85.4%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	

Table 2 shows the association of risk factors with the skin disorders among the participants. Significantly more ($p=0.001$) number of male participant's (6.7%) father was uneducated as compared to females (2.3%). Similarly, 8.3% of male students had an uneducated mother as compared to 3.7% females which was statistically significant ($p=0.000$). Alternately, 17.0% of female participants had an unemployed father as compared to 14.0% of male participants. This was statistically significant ($p=0.000$). There was not much difference in the presence of a family history of skin disorders among the male (15.1%) and female (14.3%) participants. Food allergy was present among 11.6% of males and 10.4% of female participants, while dust allergy was a positive risk factor among 17.5% males and 13.9% females in this study.

Table 3 shows the distribution of psychological and physiological problems faced by the participants due to the presence of skin disorders. Twenty-three male students (3.1%) complained of their skin feeling itchy, scratchy, sore or painful during the past month which was statistically more ($p=0.000$) than the female students (n = 7, 0.5%). Also, a greater number of male students (n = 11, 1.5%) felt upset or embarrassed with their skin disorders than female students (n = 3, 0.4%) which was statistically significant ($p = 0.000$). Difficulty in sleeping was more among males (n = 46, 6.1%) than females (n =22, 2.9%) which was again statistically significant ($p = 0.000$) difference among both the genders. Both the participants (males, n = 40, 5.34%) (Females, n = 24, 3.2%) agreed on changing their clothes often due to the skin disorders. Not many complained about getting a proper treatment for the skin disorders but 34 males (4.5%) and 31 females (4.1%) did agree that it was a little bit difficult.

Table 2 Presence of risk factors for skin disorders among school children

Risk Factors		Gender		Total	p value
		Male	Female		
Father's education	Not educated	50 (6.7%)	17 (2.3%)	67 (9.0%)	$X^2 = 19.825$ p = 0.001
	Educated	273 (36.5%)	293 (39.2%)	566 (75.7%)	
	No response	66 (8.8%)	49 (6.6%)	115 (15.4%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Mother's	Not educated	62 (8.3%)	28 (3.7%)	90 (12.0%)	$X^2 = 23.75$

education	Educated	253 (40.0%)	282 (37.7%)	536 (71.7%)	p = 0.000
	No response	73 (9.8%)	49 (6.6%)	122 (16.3%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Father's occupation	Not working	105 (14.0%)	127 (17.0%)	232 (31.0%)	$X^2 = 25.625$ p = 0. 000
	Working	204 (27.3%)	202 (27.0%)	406 (54.3%)	
	No response	80 (10.7%)	30 (4.0%)	110 (14.7%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Family history	Yes	113 (15.1%)	107 (14.3%)	220 (29.4%)	$X^2 = 2.692$ p = 0.260
	No	256 (34.2%)	242 (32.4%)	498 (66.6%)	
	No response	20 (2.7%)	10 (1.3%)	30 (4.0%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Food allergy	Yes	87 (11.6%)	78 (10.4%)	165 (22.1%)	$X^2 = 0.258$ p = 0.879
	No	289 (38.6%)	271 (36.2%)	560 (74.9%)	
	No response	13 (1.7%)	10 (1.3%)	23 (3.1%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	
Dust allergy	Yes	131 (17.5%)	104 (13.9%)	235 (31.4%)	$X^2 = 1.958$ p = 0.376
	No	247 (33.0%)	245 (32.8%)	492 (65.8%)	
	No response	11 (1.5%)	10 (1.3%)	21 (2.8%)	
	Total	389 (52.0%)	359 (48.0%)	748 (100.0%)	

Table 3 Distribution of psycho – physiological problems associated with skin disorders.

		No response	Very much	Quite a lot	A little	Not at all	Total	p value
How itchy, scratchy, sore or painful has your skin been since last month?	M	8 (1.1%)	7 (0.9%)	23 (3.1%)	138 (18.4%)	213 (28.5%)	389 (52.0%)	$X^2 = 26.456$ p = 0.000
	F	0 (0.0%)	4 (0.5%)	7 (0.9%)	97 (13.0%)	251 (33.6%)	359 (48.0%)	
Total		8 (1.1%)	11 (1.5%)	30 (4.0%)	235 (31.4%)	464 (62.0%)	748 (100.0%)	
How much have you changed or worn different or special clothes because of your skin problems?	M	4 (0.5%)	2 (0.3%)	9 (1.2%)	29 (3.9%)	345 (46.1%)	389 (52.0%)	$X^2 = 7.661$ p = 0.105
	F	0 (0.0%)	2 (0.3%)	7 (0.9%)	15 (2.0%)	335 (44.8%)	359 (48.0%)	
Total		4 (0.5%)	4 (0.5%)	16 (2.1%)	44 (5.9%)	680 (90.9%)	748 (100.0%)	
How much problem has it been to get a proper treatment for your skin problems?	M	5 (0.7%)	4 (0.5%)	7 (0.9%)	34 (4.5%)	339 (45.3%)	389 (52.0%)	$X^2 = 6.313$ p = 0.177
	F	0 (0.0%)	1 (0.1%)	6 (0.8%)	31 (4.1%)	321 (42.9%)	359 (48.0%)	
Total		5 (0.7%)	5 (0.7%)	13 (1.7%)	65 (8.7%)	660 (88.2%)	748 (100.0%)	
How much upset or embarrassed or self-conscious have you been due to your skin problems	M	3 (0.4%)	2 (0.3%)	11 (1.5%)	27 (3.6%)	346 (46.3%)	389 (52.0%)	$X^2 = 21.790$ p = 0.000
	F	0 (0.0%)	0 (0.0%)	3 (0.4%)	6 (0.8%)	350 (46.8%)	359 (48.0%)	
Total		3 (0.4%)	2 (0.3%)	14 (1.9%)	33 (4.4%)	696 (93.0%)	748 (100.0%)	
How much is your sleep affected because of your skin problems?	M	5 (0.7%)	3 (0.4%)	13 (1.7%)	46 (6.1%)	322 (43.0%)	389 (52.0%)	$X^2 = 26.608$ p = 0.000
	F	0 (0.0%)	1 (0.1%)	0 (0.0%)	22 (2.9%)	336 (44.9%)	359 (48.0%)	
Total		5 (0.7%)	4 (0.5%)	13 (1.7%)	68 (9.1%)	658 (88.0%)	748 (100.0%)	

Table 4 Distribution of social correlates with the problem of skin disorders

		No response	Very much	Quite a lot	A little	Not at all	Total	p value
How much has your skin problem affected your friendship?	M	3 (0.4%)	4 (0.5%)	12 (1.6%)	49 (6.6%)	321 (42.9%)	389 (52.0%)	$X^2 = 16.201$ p = 0.003
	F	0 (0.0%)	1 (0.1%)	0 (0.0%)	42 (5.6%)	316 (42.2%)	359 (48.0%)	
Total		3 (0.4%)	5 (0.6%)	12 (1.6%)	91 (12.2%)	637 (85.2%)	748 (100.0%)	
How much has your skin problems affected going out, playing or doing hobbies outside?	M	5 (0.7%)	5 (0.7%)	7 (0.9%)	34 (4.5%)	338 (45.2%)	389 (52.0%)	$X^2 = 6.313$ p = 0.177
	F	0 (0.0%)	1 (0.1%)	3 (0.4%)	9 (1.2%)	346 (46.3%)	359 (48.0%)	
Total		5 (0.7%)	6 (0.8%)	10 (1.3%)	43 (5.7%)	684 (91.4%)	748 (100.0%)	
How much have you avoided swimming or other sports because of your skin problems?	M	5 (0.7%)	6 (0.8%)	7 (0.9%)	30 (4.0%)	341 (45.6%)	389 (52.0%)	$X^2 = 24.603$ p = 0.000
	F	0 (0.0%)	0 (0.0%)	0 (0.0%)	12 (1.6%)	347 (46.4%)	359 (48.0%)	
Total		5 (0.7%)	6 (0.8%)	7 (0.9%)	42 (5.6%)	688 (92.0%)	748 (100.0%)	
How much did your skin problems affect your school attendance?	M	7 (0.9%)	3 (0.4%)	6 (0.8%)	21 (2.8%)	352 (47.1%)	389 (52.0%)	$X^2 = 13.138$ p = 0.01
	F	1 (0.1%)	0 (0.0%)	0 (0.0%)	16 (2.1%)	342 (45.7%)	359 (48.0%)	
Total		8 (1.1%)	3 (0.4%)	6 (0.8%)	37 (4.9%)	694 (92.8%)	748 (100.0%)	
How much trouble did other people give you because of your skin problems?	M	6 (0.8%)	1 (0.1%)	6 (0.8%)	26 (3.5%)	350 (46.8%)	389 (52.0%)	$X^2 = 9.529$ p = 0.049
	F	0 (0.0%)	1 (0.1%)	3 (0.4%)	14 (1.9%)	341 (45.6%)	359 (48.0%)	
Total		6 (0.8%)	2 (0.3%)	9 (1.2%)	40 (5.3%)	691 (92.4%)	748 (100.0%)	

Table 4 gives the distribution of social correlates of skin disorders among the participants. Effect on friendship was felt a little by 49males (6.6%) and 42 females (5.6%) while a lot by 12 male participants (1.6%) and none by the females which was statistically significant (p = 0.003). The participants also agreed that their sports activities like swimming was affected a little (males, n = 30, 4.0%) (Females, n = 12, 1.6%). Also, statistically significant (p = 0.000) number of males (n = 7, 0.9%) avoided sports and swimming quite a lot as compared to none of the female participants. School attendance was affected among 30 (4.01%) male participants due to skin problems as compared to 16 females (2.1%) and this difference was statistically significant (p = 0.01). At least 26 (3.5%) males as compared to 14 (1.9%) females complained of others giving them trouble due to their skin problems which was statistically significant (p = 0.049). As far as going out or following their hobbies outside was concerned 34 (4.5%) males and 9 (1.2%) females agreed that they are reluctant to do it due to their skin disorders.

4. DISCUSSION

There were 748 participants in this study out of which 389 (52%) were males and 359 (48%) were females. Most of the participants are in the 14 – 18 years age group 57.89 %. In our study showed that acne was more prevalent among 139 (18.6%) males than 103 (13.8%) female. This was statistically significant (p<0.05). A similar study done in Majmaah showed eczema was most frequently diagnosed, comprising 15.81% (159/1006) while acne was 14.71% (148/1006) the second most common (Al-Hoqail, 2013). Other

study done in Hail showed eczema as the most common dermatological disease (37%) followed by atopic dermatitis (12%) and acne (20%) (Al Shammrie, 2017). In our study of risk factors, the association with dust allergy was most common among 17.5% males and 13.9% females. On comparing with a study done in Alhasaaa similar association was shown between dust allergy and pediculosis and fungal infections which was more in rural residences. Another study found that frequent showering and high family income were both negative predictors for the development of infectious (transmissible) dermatoses (Amin et al., 2011).

In our study another association of skin disorders with psychological and physiological problems showed that they are more prevalent among boys than girls. Both males and females agreed on changing their clothes often due to the skin disorders. Other similar study showed a significantly higher prevalence of clinical depression (10.1% vs. 4.3%), anxiety disorder (17.2% vs. 11.1%), and suicidal ideation (12.7% vs. 8.3%) among patients with common skin diseases when compared with controls (Dalgard et al., 2015). In our study distribution of social correlates with the problem of skin disorders found that around 34 males (4.5%) and 31 females (4.1%) had complaints of not being able to access proper treatment. A study in Qassim region has recommended better training of primary care physicians to provide quality care to patients with skin disorders (Abolfotouh et al., 2012).

5. CONCLUSION

This study tried to identify the prevalence of skin disorders among the adolescent school children and consequently its effect in the day to day activities. It was found that common skin disorders like acne, dry skin, dandruff and oily skin are quite prevalent. A positive association between the risk factors and skin disorders was also found. This study also concluded that the male participants suffer more psychological and physiological effects of skin disorders than the females. This could be due to the fact that males are most of the time outside their home environment and interacting more with their peers than females.

Limitations of the study

Since this is a cross – sectional study, it cannot be used to analyze behavior over a period to time. Also, it does not help determine cause and effect. The timing of the study does not guarantee it to be representative to the whole population. Further cohort and follow up study are required to validate our preliminary findings.

Recommendations

We recommend a healthy lifestyle with good diet, regular exercise and drinking plenty of water to reduce the risk of skin disorders. Further, health education should also be given to the parents of children on how to identify skin disorders and get appropriate treatment from the healthcare services. Counselling session should be arranged by school authorities and healthcare professionals to deal with the presence of skin disorders. This will help in improving the social and psychological outlook of the adolescent children. A follow up study should be done afterwards to find out the impact of the interventions recommended.

Informed consent

Informed consent was obtained from all participants included in the study.

Ethical considerations

Prior to the start of the study, ethical approval was obtained from the Deanship of Scientific Research. With approval No. MUREC Dec.18-/COM-2018/11.

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Author Contributions

All the authors contributed evenly with regards to data collecting, analysis, drafting and proofreading the final draft.

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Conflict of Interest

There are no conflicts of interest.

Data and materials availability

All data associated with this study are present in the paper.

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