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Skin Diseases Among School Children with Disabilities Attending Special Schools in Sohag Governorate, Upper Egypt

Mohammed Abu El-Hamd ^{1,*}, Hanan Abdel Rady Assaf ¹, Essam El Din Abd-El Aziz Nada¹, Wafaa Mohamed Abd Elmaged¹, Zeinab Abu Elbaha MBBCH¹, Mahmoud Hussein², Abdelrahim AbdrabouSadek³ and Gamal Youssef

¹ Department of Dermatology, Venereology and Andrology, Faculty of Medicine, Sohag University - Upper Egypt.

² Department of Pathology, Faculty of Medicine, Assuit University, Assuit, Egypt.

³ Department of Pediatric, Faculty of Medicine, Sohag University, Upper Egypt

⁴ Department of Plastic Surgery, Faculty of Medicine, Sohag University, P.O. Box 82524, Sohag, Egypt.

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Abstract:

Background: Skin diseases are a major health problem affecting a high proportion of the population and causing distress and disability. Disabled children may be particularly susceptible to skin disorders. Data regarding the dermatological problems encountered among physically and/or mentally challenged children are limited in Egypt. **Objectives:** The present study aimed to determine the pattern and the prevalence of skin diseases among disabled children attending special schools in Sohag, Governorate Upper Egypt. **Patients and methods:** This study was a cross-sectional study carried out in September 2013 and April 2014 including students in all schools caring for disabled students in Sohag Governorate. A total of 1107 students (99 blind, 740 deaf mute and 268 mentally retarded) aged 6–25 years were subjected to dermatological examination. **Results:** The mean age of the students was 13.82 ± 3.72 years. The male to female ratio was 1.87: 1. Skin disorders were observed in 756 students, with an overall prevalence of (68.29%) and 351 (31.71%) were clinically free. Allergic skin diseases, infectious skin diseases, acne vulgaris, pigmentary disorders, ichthyosis, hair disorders, scars and skinxerosis were the most frequent diseases among disabled school children accounting for (63.78%). **Conclusion:** Allergic skin diseases, infectious skin diseases and acne vulgaris were the most prevalent dermatoses among disabled school children in Sohag Governorate. Eczema was the most prevalent allergic disorder. Pediculosis capitis was the most prevalent infectious disorder.

Keywords: Skin diseases, Children with disabilities

1 Introduction:

A study of pediatric population, which constitutes the cornerstone of the community, can play an important role in determining the

policies of protective medicine and public health [1]. School environment makes children vulnerable to cross transmission of communicable skin diseases among themselves and their families [2]. The United Nations defines disabilities as “long-term physical,

*Corresponding author e-mail: mohammedadva@yahoo.com

mental, intellectual or sensory impairments which in interaction with various barriers may hinder a person's full and effective participation in society on an equal basis with others [3]. Disabled children may be particularly susceptible to skin disorders, sometimes as a direct consequence of their disability, which prevents them from undertaking normal care of their skin, or because they lack awareness regarding personal and environmental hygiene. All of these may result in skin problems, which add to the child's physical and emotional distress [4]. In some instances, patients appear to produce their skin lesions as an outlet for nervous tensions arising from interpersonal conflicts and/or unresolved emotional problems [5]. There is no data regarding disabled children in Upper Egypt so, the present study aimed to determine the pattern and the prevalence of skin diseases among disabled children attending special schools in Sohag, Governorate Upper Egypt.

2 Methods:

This is cross sectional study conducted between September 2013 and April 2014. It included all students in all 9 special schools caring for disabled students in Sohag governorate (Sohag school for mentally retarded students, Al-amal school in Sohag for deaf-mute, Al-amal school in Al-kawther for deaf-mute students, Al-nour school in Sohag for blind students, Tahta school for mentally retarded students, Al-amal school in Tahta for deaf-mute students, Gerga school for mentally retarded students, Al-amal school in Gerga for deaf-mute students and Shattora school for deaf-mute and mentally retarded students). The total number of students in those schools was 1781 students. 674 students were absentee from schools all over the year.

The study was submitted for approval by Ethical and Research committees at Faculty of Medicine, Sohag University. Consent for examination was obtained from students themselves or their parents after approval by the responsible authorities.

A total 1107 students were examined (99 blind, 740 deaf-mute and 268 mentally retarded). Visits were carried out to each school twice weekly. Data regarding the disabilities among the students were obtained from the school records, parents and social workers. The students were divided into four age groups: primary grade: 6-14 years old, preparatory grade: 15-17 years old, secondary grade: 18-20 years old and the older than 20 years old.

Each student was examined in a private room in presence and assistance of health care providers. Dermatological examination included skin, mucous membrane, hair and nails. Genital areas were skipped because of privacy concerns. The diagnosis of skin disease and any associated syndromes was done mainly on clinical examination. The studied cases were divided according to etiology into infectious skin diseases and noninfectious skin diseases. Infectious skin disease included bacterial skin infections, viral infections, fungal infections and parasitic infestations. Noninfectious skin diseases included allergic skin diseases, sweat gland disorders, papulosquamous disorders, hair disorders, pigmentary disorders, genodermatoses, follicular disorders, mucous membrane disorders and other skin disorders.

3 Statistical Analysis:

Data were analyzed using Statistical Package for Social Sciences (SPSS) software program (version 15). Qualitative variables were recorded as frequencies and percentages. Quantitative variables were presented as means \pm standard deviation (SD).

4 Results:

The total number of examined students in this study was 1107 students representing (62.16 %) of the total number of students. The mean age of the students was 13.82 ± 3.72 years. 721 (65.13 %) students were males. 513 (46.34 %) students were resident in the school. 408 (36.86 %) of students were from urban areas and 186 (16.8 %) were from rural areas. 29 (2.62 %) of students were in preprimary grade. 663 (59.8 %) were in primary grade, 231 (20.87 %) were in

preparatory grade and 185 (16.71 %) were in secondary grade. Table 1

The overall prevalence of skin diseases among the three groups of students with disabilities is 68.29% with highest prevalence among mentally retarded students 69.78%. 79.76% of students had single skin disease with highest prevalence among mentally retarded students. 17.86% had two skin diseases with highest prevalence among deaf-mute students and 2.38 % had three skin diseases with highest prevalence also among deaf-mute students. Non-infectious diseases had a prevalence of 57.18% representing 83.73% of the total skin diseases. Infectious diseases had a prevalence of 16.98% representing 24.67% of the total skin diseases. Table 2 Parasitic skin infestations were the most prevalent infectious skin diseases

maximally present among blind students 10.10%. Bacterial infections were the second most prevalent infectious skin diseases 3.70% with highest prevalence among mentally retarded students 5.97% with impetigo being the most prevalent one, maximally present among mentally retarded students 4.10%. Fungal infections were the third most prevalent one 3.07%, with highest prevalence among mentally retarded students 3.73% with pityriasis versicolor being the most prevalent one, maximally present among blind students, 3.03%. Lastly, viral infections, 2.53% with highest prevalence among deaf-mute students 2.97% with warts being the most prevalent one, maximally present among deaf-mute students 1.62%. Table 3

Table1. Sociodemographic characteristics of students with disabilities attending special schools in Sohag Governorate.

Characteristic	Total N= 1107	Blind N=99	Deaf-mute N=740	Mentally retarded N=268
Age groups				
• 6-14	627 (54.83%)	50 (50.51%)	374 (50.54%)	183 (68.28%)
• 15-17	282 (25.47 %)	26 (26.26%)	193 (26.08%)	63 (23.51%)
• 18-20	189 (17.07 %)	21 (21.21%)	146 (19.73%)	22 (8.21%)
• >20	29 (2.62 %)	2 (2.02%)	27 (3.65%)	0 (0.00%)
Age (year) (Mean ± SD)	13.82 ± 3.72	14.16 ± 4.14	14.14± 4.08	13.16 ± 2.96
Sex				
• Female	386 (34.87 %)	38 (38.38%)	299 (40.41%)	49 (18.28%)
• Male	721 (65.13 %)	61 (61.62%)	441 (59.59%)	219 (81.72%)
Residence				
• School	513 (46.34 %)	70 (70.71%)	332 (44.86%)	111 (41.42%)
• Urban	408 (36.86 %)	12 (12.12%)	301 (40.68%)	95 (35.45%)
• Rural	186 (16.8 %)	17 (17.17%)	107 (14.46%)	62 (23.13%)
Education				
• Preprimary	29 (2.62 %)	0 (0.00%)	0 (0.00%)	29 (10.82%)
• Primary	662 (59.8 %)	46 (46.46%)	428 (57.84%)	188 (70.15%)
• Preparatory	231 (20.87 %)	23 (23.23%)	157 (21.22%)	51 (19.03%)
• Secondary	185 (16.71 %)	30 (30.30%)	155 (20.95%)	0 (0.00%)

P value < 0.05 was significant

8.58% with highest prevalence among blind students 10.10% with pediculosis capitis being the most prevalent infectious skin disease,

Table 2. Skin diseases among students attending special schools in relation to type of disability

Skin disease	Total N= 1107	Blind N=99	Deaf-mute N=740	Mentally retarded N=268
Presence of skin disease				
• Absent	351 (31.78%)	39 (39.39%)	231 (31.22%)	81 (30.22%)
• Present	756 (68.29%)	60 (60.61%)	509 (68.78%)	187 (69.78%)
Infectious skin disease				
• Absent	921 (83.01%)	81 (81.82%)	615 (83.11%)	223 (83.21%)
• Present	188 (16.98%)	18 (18.18%)	125 (16.89%)	45 (16.79%)
Non-infectious skin disease				
• Absent	474 (42.81%)	52 (52.53%)	309 (41.76%)	113 (42.16%)
• Present	633 (57.18%)	47 (47.47%)	431 (58.24%)	155 (57.84%)
Number of different types of skin disease				
1	603 (79.76%)	50 (50.51%)	400 (54.05%)	153 (57.09%)
2	135 (17.86%)	9 (9.09%)	96 (12.97%)	30 (11.19%)
3	18 (2.38%)	1 (1.01%)	13 (1.76%)	4 (1.49%)

P value < 0.05 was significant. (Some patients may have both infectious and non infectious skin diseases due to which they sum up more than 756)

Among non-infectious skin diseases, allergic skin diseases had the highest prevalence 25.84% representing 45.18% of the non-infectious diseases with highest prevalence among mentally retarded students 28.36%. Eczema was the most prevalent allergic disease 13.01% (pityriasis alba 6.32%, atopic dermatitis 2%, contact dermatitis 0.72%, seborrheicdermatitic 0.36% and other types of 13.01% (pityriasis alba 6.32%, atopic dermatitis 2%, contact dermatitis 0.72%, seborrheicdermatitic 0.36% and other types of eczema 3.6%) with highest prevalence among deaf-mute students 13.51%. Acne vulgaris had a prevalence of 10.93%, representing 19.12% of the non-infectious diseases with highest prevalence among deaf-mute students 12.03%. Table 4

5 Discussion:

Many factors determine the results of epidemiologic studies on skin diseases, including ethnic background, geographic area, climate, season, socioeconomic status, living

conditions, and medical resources [6]. Studies from developing countries have reported high prevalence of skin disorders among school children, the spectrum of which has been highly variable, but there is paucity of data regarding the dermatological problems encountered among physically and/or mentally challenged children [7].

As regard to age, most students were in the primary grade age group (6-14) while the lowest number was observed in adolescence (≥ 20) years old. According to our finding in relation to sex, male predominance (65.13 %) was observed. Male to female ratio was 1.87: 1. Our results were similar to those among other disabled student where male to female ratio was 1.7:1 in India [2] and in Mansoura, Egypt; the ratio was 1.11: 1. [3] Male predominance in our study may be due to cultural believes in our locality preferring keeping disabled females away at homes. In this study, the pattern and the prevalence of skin diseases in special schools caring for disabled students in Sohag Governorate, Upper Egypt, and its relationship

Table 3. Distribution of different types of infectious skin diseases among students attending special schools according to type of disability

Infectious Skin disease	No (%)	Blind N=99	Deaf-mute N=740	Mentally retarded N=2
Parasitic infestations	95 (8.58%)	10 (10.10%)	69 (9.32%)	16 (5.97%)
Pediculosis	92 (8.31%)	10 (10.10%)	66 (8.92%)	16 (5.97%)
Scabies	3 (0.27%)	0	3 (0.41%)	0
Bacterial infections	41 (3.70%)	4 (4.04%)	21 (2.84%)	16 (5.97%)
Impetigo	27 (2.44%)	2 (2.02%)	14 (1.89%)	11 (4.10%)
Folliculitis	6 (0.54%)	1 (1.01%)	2 (0.27%)	3 (1.12%)
Furuncles	3 (0.27%)	0	2 (0.27%)	1 (0.37%)
Ecthyma	2 (0.18%)	1 (1.01%)	1 (0.14%)	0
Erysipelas	1 (0.09%)	0	0	1 (0.37%)
Streptococcal intertrigo	1 (0.09%)	0	1 (0.14%)	0
Abscess	1 (0.09%)	0	1 (0.14%)	0
Fungal infections	34 (3.07%)	3 (3.03%)	21 (2.84%)	10 (3.73%)
Pityriasis versicolor	20 (1.81%)	3 (3.03%)	12 (1.62%)	5 (1.87%)
Tinea capitis	5 (0.45%)	0	2 (0.27%)	3 (1.12%)
Tinea circinata	4 (0.36%)	0	3 (0.41%)	1 (0.37%)
Candidal paronychia	4 (0.36%)	0	3 (0.41%)	1 (0.37%)
Viral infections	28 (2.53%)	1 (1.01%)	22 (2.97%)	5 (1.87%)
Wart	16 (1.45%)	1 (1.01%)	12 (1.62%)	3 (1.12%)
Herpes labialis	11 (0.99%)	0	9 (1.22%)	2 (0.75%)
Molluscum contagiosum	1 (0.09%)	0	1 (0.14%)	0

P value < 0.05 was significant

with socio-environmental factors were studied. It revealed an overall prevalence of skin diseases of 68.29 % which was highest among the mentally retarded students (69.78%). Lower results were among disabled Indian students, 53.2% [7] while higher results were among disabled students in Mansoura, Egypt, 89.5% among blind, 99.3% among deaf-mute and 100% among mentally retarded students [4]. Studies of non-disabled students in Egypt

revealed higher results, 71.4% in South Sinai [8] and lower results in Sohag, 41.5%.⁽⁹⁾ This may be attributed to poor personal hygiene among disabled students, low level of awareness among them, their families and/or care givers; in addition to increased liability to trauma, bad nutritional status and observing that skin lesions that would annoy people who are not healthy may often go unnoticed in disabled persons.

Table 4. Distribution of different types of non-infectious skin diseases among three groups of students attending special schools according to type of disability.

Non Infectious Skin disease	No. (%)	Blind N=99	Deaf-mute N=740	Mentally retarded N=268
	286 (25.84%)	25 (25.25%)	185 (25%)	76 (28.36%)
Allergic diseases		10	100 (13.51%)	34 (12.69%)
Eczema	144 (13.01%)	(10.10%)	85 (11.49%)	42 (15.67%)
Papular urticaria	142 (12.83%)	(15.15%)		
Acne vulgaris	121 (10.93%)	11 (11.11%)	89 (12.03%)	21 (7.78%)
Pigmentary disorders	52 (4.70%)	4 (4.04%)	41 (5.54%)	7 (2.61%)
Vitiligo	29 (2.62%)	2 (2.02%)	21 (2.84%)	6 (2.24%)
Freckles	14 (1.26%)	1 (1.01%)	12 (1.62%)	1 (0.37%)
Piebaldism	7 (0.63%)	0	7 (0.95%)	0
Hypo pigmented post	2 (0.18%)	1 (1.01%)	1 (0.14%)	0
Hair disorders	47 (4.25%)	4 (4.04%)	32 (4.32%)	10 (3.73%)
Cicatricial alopecia	15 (1.36%)	1 (1.01%)	7 (0.95%)	7 (2.61%)
Telogen effluvium	13 (1.17%)	3 (3.03%)	10 (1.35%)	0
Dandruff	11 (0.99%)	1 (1.01%)	8 (1.08%)	2 (0.75%)
Alopecia areata	8 (0.72%)	0	7 (0.95%)	1 (0.37%)
Mucous membrane affection	29 (2.62%)	1 (1.01%)	20 (2.70%)	8 (2.98%)
Cheilitis	18 (1.63%)	1 (1.01%)	14 (1.89%)	3 (1.12%)
Aphthous stomatitis	8 (0.72%)	0	2 (0.27%)	1 (0.37%)
Angular stomatitis	3 (0.27%)	0	4 (0.54%)	4 (1.49%)
Ichthyosis	50 (4.52%)	2 (2.02%)	37 (5.00%)	11 (4.10%)
Scars	46 (4.16%)	0	34 (4.59%)	12 (4.48%)
Xerosis	37 (3.34%)	3 (3.03%)	22 (2.97%)	12 (4.48%)
Follicular disorders	17 (1.54%)	1 (1.01%)	10 (1.35%)	6 (2.24%)
Nail disorders	13 (1.17%)	0	9 (1.22%)	4 (1.49%)
Koilonychias	10 (0.90%)	0	7 (0.95%)	3 (1.12%)
Brittle nails	3 (0.27%)	0	2 (0.27%)	1 (0.37%)
Papulosquamous diseases	10 (0.90%)	0	6 (0.81%)	4 (1.49%)
Genodermatoses	9 (0.81%)	1 (1.01%)	4 (0.54%)	4 (1.49%)
Disorders of sweat glands	7 (0.63%)	0	6 (0.81%)	1 (0.37%)
Naevi	4 (0.36%)	0	2 (0.27%)	2 (0.75%)
Burns	3 (0.27%)	0	3 (0.41%)	0
Discoid lupus erythematosus	2 (0.18%)	0	0	2 (0.75%)
Drug reaction	2 (0.18%)	0	1 (0.14%)	1 (0.37%)
Callosities	2 (0.18%)	0	1 (0.14%)	1 (0.37%)
Pyogenic granuloma	2 (0.18%)	0	2 (0.27%)	0
Syringoma	2 (0.18%)	1 (1.01%)	1 (0.14%)	0
Spider varicosities	1 (0.09%)	0	1 (0.14%)	0
Skin tags	1 (0.09%)	0	1 (0.14%)	0
Epidermoid cyst	1 (0.09%)	0	1 (0.14%)	0

P value < 0.05 was significant

Non-Infectious diseases had a prevalence of 57.18%; This was consistent with results from Mansoura, Egypt where non-infectious diseases had prevalence of 78.9% among blind students, 97.1% among deaf-mute students (highest prevalence) and 88.6% among mentally retarded students [4]; Also this was the situation among disabled Indian students among whom non infectious diseases had a prevalence of 61.5% [7]. This may be due to presence of high number of adolescents and frequent traumas.

The most prevalent skin disease was allergic skin diseases, 25.84% representing (45.18%) of the non-infectious diseases with highest prevalence among mentally retarded students, 28.36%. Allergic diseases were the second most prevalent disease among disabled Indian students, 12.3% [7]. Similar figures were reported among non-disabled children and adolescents in Egypt; 25.8% in South Sinai [8] and 22% in Cairo [10].

Eczema was the most frequent allergic disease with overall prevalence of 13.01% representing 50.35% of all allergic diseases with highest prevalence among deaf-mute students, 13.51%. Similar prevalence of 12.7% was reported among non-disabled infants and children in Al Sharqia Governorate, Egypt [11] and 12.94% in Cairo, Egypt [10]. Variations in the reported rates may be due to differences in research design and type, genetic, racial, climatic and environmental factors [12].

Contact with irritants as soap and detergents without risk perception may play a role in increasing the frequency of eczema among students who have disabilities. Additionally, the observed dry skin among this group, frequent trauma and scratching the skin are all factors which may aggravate eczema [4]. Pityriasis alba was the most frequent eczematous diseases with overall prevalence of 6.32% representing 24.45% of all allergic diseases with highest prevalence among mentally retarded students. It also was the most common allergic disease among disabled students in Mansoura, Egypt; 3.9% among blind students, 13.5% among deaf-mute students and 10.5% among mentally retarded students [4].

Papular urticaria was the second frequent allergic disease with overall prevalence of 12.83% representing 49.65% of all allergic diseases with highest prevalence among mentally retarded students 15.67%. The prevalence of papular urticaria among disabled students in Mansoura, Egypt was 5.3% among blind students, 11.4% among deaf-mute students and 6.1% among mentally retarded students [4]. High frequency among disabled students may be attributed to the children being unaware of the antecedent bite as some students may not see or hear the insect. Also, many students live in the school, with shared bedrooms where they are exposed to insects. Furthermore, mentally retarded students may hold or come in contact with infected pet animals that increase the chance of infestation by fleas and mites [4].

Infectious diseases were the second most common skin disease; 16.89% of deaf-mute students, 16.79% of mentally retarded students and 18.18% of blind students. Those results are lower than those obtained in Mansoura, Egypt which showed 59.2% of the blind, 65.5% of the deaf-mute and 78.9% of the mentally retarded students had 1 or more infectious skin diseases [4]; in Saudi Arabia; 28.8 and 20.3% were reported among blind and deaf pupils, respectively [13] and in Southern India, where 38.5% of disabled students had infectious skin diseases [7].

Parasitic infestations were the most prevalent infectious diseases, 8.58% occurred among (10.10%) of blind, (9.32%) of deaf-mute and (5.97%) of mentally retarded students compared to (44.7%) of blind students, (50.9%) of deaf-mute students and (54.4%) of mentally retarded students in Mansoura, Egypt [4]. This may be attributed to presence of higher age groups and recent date of our study.

Pediculosis capitis was the most prevalent parasitic infestation occurred in 10.10% of blind, 8.92% of deaf-mute and 5.97% of mentally retarded students compared to 44.7% of blind, 50.9% of deaf-mute students and 54.4% of mentally retarded students in Mansoura, Egypt [4]. Data from studies conducted in schools of non-disabled Egyptian students reported higher prevalence of

pediculosis; 48.2% in Beni Suef [14]; 47.5% in Damietta [15]; 37.6% in South Sinai [8]; 32.2% in Minofiya [16]; 27.3% in Sohag [9]; 21.8% in Cairo [17] and 15.98 % in Sohag [18]. These differences may be attributed to variations in personal and environmental hygiene and degree of exposure.

Scabies occurred in 3 students in our study with overall prevalence of 0.27%; similar results obtained from Mansoura, Egypt [4] with overall prevalence of (0.47%) among disabled students but higher among Indian disabled students, 20% [7].

Acne vulgaris was the third prevalent skin disease 10.93% among disabled students. It was representing 19.12% of the non-infectious diseases with highest prevalence among deaf-mute students 12.03%. Similar figures were reported among disabled students in Mansoura, Egypt 15.8% among blind students, 3.5% among deaf-mute students and 10.5% among mentally retarded students [4] and among disabled Indian students' acne was the second most common skin disease and the most prevalent non-infectious disease with a prevalence of 23.1% [7]. This may be due to high number of adolescents in our study and the increasing overall global incidence of acne vulgaris.

This study reported that pigmentary disorders had a prevalence of 4.70%. Vitiligo was the most prevalent pigmentary disorders 2.62%. Waardenburg syndrome was detected among the 0.95% of deaf-mutes. This syndrome is characterized by deafness and pigmentary disorders of the eyes, hair and skin. In a study from South Africa, Waardenburg syndrome was detected among 2.7 % of deaf students [19] this difference might be attributed to racial factors.

Ichthyosis had a prevalence of 4.52% including 3 students with ichthyosis vulgaris and 1 with lamellar ichthyosis. Hair disorders had a prevalence of 4.25% with cicatricial alopecia being the most prevalent 1.36%. Similar results occurred in Mansoura, Egypt with prevalence of 3.9% among blind students, 1.1% among deaf-mute students and 0.9% among mentally retarded students [4]. Its high prevalence may be due to frequent trauma (which usually passes

unnoticed) in disabled students or self-injurious behavior.

Other dermatoses occurred in descending order of frequencies included: traumatic Scars and keloids 4.16%; xerosis 3.34%; mucous membrane disorders 2.62%; follicular disorders 1.54%, nail disorders 1.17% and papulosquamous diseases 0.90%. Sporadically detected dermatoses included: genodermatoses, sweat glands disorders, naevi, burns, discoid lupus erythematosus, drug reactions, callosities, pyogenic granuloma, syringoma, epidermoid cyst, skin tags and spider varicosities.

Finally, we conclude that skin diseases are common among school children with disabilities in the Sohag Governorate. Allergic and Communicable diseases accounted for 42.82% of the detected skin diseases. Ministries of health and education together with Childrights organizations in Egypt need to do much effort to enhance the medical, nutritional and psychosocial conditions of such students by regular follow up by school physicians and medical missions; ensure adequate access to health care services (e.g. ensuring adequate school health program, proper training and education of health care providers and psychiatric specialists responsible for those students and referral to specialized centers or hospitals), entertainments and sharing athletic activities and to enhance creative aspects of those students for future employment, talent enhancement and protection from any mean of abuse at the school, community and work levels.

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