Research Article

iMedPub Journals
www.imedpub.com

Health Science Journal
ISSN 1791-809X

2021
Vol. 15 No. 8: 870

A Cross Sectional Study on Health and Nutritional Status of School Age Children (6 to 19 years) of Rural Area Schools of Punjab Province, Pakistan

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Abstract

Background: The most common dilemma in the developing countries like Pakistan is nutritional deficiencies, the Government is already working to overcome the nutritional deficiencies and also devising presentive strategies for children & adolescent health.

Objective: To determine the nutritional & health status of rural school children age 6–19 years of Punjab and present possible methods to improve the nutritional and health status during this life stage for a long-term health impact.

Methods: A cross sectional descriptive study was carried out among school children between age (6 to 19 years) in Punjab. Clinical examination and anthropometric measurements were used to determine the nutritional & health condition of the children.

Results: Three hundred thousand (300,000) children have been screened and a sample of 384 children was selected by adopting the prevalence formula. The overall prevalence of underweight was 21.1% (81) and stunting was 33.3% (128), dental caries in 11.5% (44), dental hygiene in 27.1% (104) and gums bleeding in 4.2% (16), anemia 1.8% (7), itching, scabies & eczema in 6.8% (26). Cough 13.3% (51), Eyesight weak (near & far sighted) 1.6% (6), Ear changes in form of discharge, wax, pain & otitis in 3.6% (14), behavioral changes such as irritant 14.8% (57), laziness in 3.9% (15) and in absence mind 4.4% (17) children.

Conclusion: The health & nutritional status of children was found substandard, especially in terms of nutritional deficiencies, dental, behavioral and skin issues along with personal hygiene. Apart from the daily educational programs in society; nutritional education, personal hygiene education, and fitness education should be prioritized. Furthermore, suggestions and measures according to the SDG 3 (Ensure healthy lives + promote well-being for all at all ages) should be taken to improve the health and nutritional status of children.

Keywords: Nutritional deficiencies; Clinical examination; Underweight; Stunting

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Citation: Zareen S (2021) A Cross Sectional Study on Health and Nutritional Status of School Age Children (6 to 19 years) of Rural Area Schools of Punjab Province, Pakistan. Health Sci J. 15 No. 8: 870.

Received with Revision on: July 29, 2021, **Accepted:** August 12, 2021, **Published:** August 20, 2021

Introduction

Malnutrition, according to the World Health Organization (WHO), is described as deficits, excesses, or imbalances in a person's energy or nutritional intake. Inadequate macro- and micronutrient diets trigger under nutrition, which presents itself in four ways: wasting, underweight, development stunting, and dietary deficiencies [1]. Malnutrition of children is a major public health problem with far-reaching consequences. Malnourished infants are more likely to die from infectious infections, and malnutrition is the source of 45 percent of global mortality of children under the age of five [2]. It is well recognized that maternal, fetal, and child nutrition play significant roles in the proper growth and development, including potential socio-economic status of the child [3], on the other hand, becoming underweight is a major public health issue among teenagers, especially school-aged children in Southeast Asian countries, as it has a negative effect on health, cognition, and educational achievement [4].

About 70% of the world's malnourished children live in Asia. Stunting and underweight are common in the South Asian zone, with one out of every two preschoolers stunted. Iron deficiency anemia impacts 40 percent to 50 percent of children in nursery and elementary school. The area accounts for nearly half of all

vitamin A deficiency and exophthalmia in the world [5].

Despite economic and social progress, childhood hunger remains a significant public health and social issue in developing countries. Low birth weight, insufficient breast feeding and exclusive breastfeeding, ineffective supplemental feeding, maternal schooling, lack of dietary awareness, micronutrient consumption, parity, birth spacing, household socioeconomic status, nutritional malnutrition, bad hygiene, vaccination, and infectious diseases are all contributing factors [6].

In comparison to other developing countries, Pakistan has one of the highest prevalence rates of child malnutrition [7]. Punjab generates more than 52% of the national income and is home to about 56% of the country's population [7]. According to the 2018 National Nutrition Survey, 28.9% of all children are underweight, almost 40% are stunted, 17.7% are wasting, and 53.5% are anemic [8]. Stunting (43.2%), wasting (18.6%), and underweight (31.6%) are more common in rural communities than in metropolitan areas (34.8%), wasting (16.2%), and underweight (24%); in a gender-based situation, boys are more stunted, wasted, underweight, and overweight than girls [8]. Just a few studies of substantially centered Eastern and Central Punjab exist, as well as a single sample of focused data of school children aged 5 to 14 years from Bahawalpur's rural region [9] to focusing southern Punjab region.

Aims and Objectives

The aim of this study was to determine the health and nutritional status of school-age children 6 to 19 years in Punjab Province, Pakistan. For resource-poor nations, the School Health and Nutrition (SH&NP) program is a cost-effective solution. The SH&N Program seeks to provide timely resources and prevention interventions for school-age children's welfare, which is linked to their social growth, learning, and academic achievement [10].

Stakeholders at various levels may have a direct impact on the program's execution and performance. Schools have long served as an effective venue for promoting health-related services [11].

Material and Methods

This is a comprehensive and informative cross-sectional analysis; we studied children age 6 to 19 years old of rural areas of Punjab, Pakistan. Clinical analysis and anthropometric measurements were used to determine the nutritional & health condition of the children.

Results

There were 384 children in total that were studied. Underweight was prevalent in 21.1% of the population (81) and stunting was prevalent in 33.3% (128). Dental caries was seen in 11.5% (44), dental hygiene in 27.1% (104), and gum bleeding in 4.2% of the children (16). Anemia was noted in 1.8% (7). Skin changes noted in the form of itching, scabies & eczema in 6.8% (26). Cough was seen in 13.3 percent of the people (51). 1.6 percent of people have poor vision (6). Discharge, wax, discomfort, and otitis were recorded in 3.6 percent of the cases (14). Irritant children accounted for 14.9 percent (57), laziness for 3.9 percent (15), and lack of mind for 4.4 percent (17) of the children.

Result and Discussions

A total of 384 children between the age of 6 and 19 years were observed (**Table 1**). There were 384 students in all, with 316 (82.3%) boys and 68 (17.7%) females.

34 (8.9%) of the 384 children were between the age of 6 and 7 years, and 47 (12.2%) were between the age of 7 and 8 years, respectively. 67 (17.4%) were in the 8-9 years age group, 38 (9.9%) in the 9-10 years age group, 31 (8.1%) in the 10-11 years age group, and 38 (9.9%) in the 11-12 years age group. 38 (9.9%) belonged to the 12-13 years age group, 44 (11.5%) to the 13-14 years age group, 26 (6.8%) to the 14-15 years age group, and 11 (2.9%) to the 15-16 years age group. 6 (1.6%) were in the 16-17 years old age category, while 2 (0.5%) were in the 17-18 and 18-19-years old age groups, respectively (**Table 2**).

Prevalence of stunting

Stunting was shown to be prevalent in 33.3% (128) of under-studied school children (**Table 3**). Stunting was found to be prevalent in 31.3% of boys (99) and 42.6% of girls (29). Stunting was found to be more common in girls than boys (42.6% vs. 31.3%). Stunting was found to be prevalent among boys in the age group 13-14 years, with 19.2%, and among girls in the age group 9-10 years, with 24.1%.

Prevalence of underweight

Underweight was shown to be prevalent in 21.1% of the school children surveyed (81) (**Table 4**). Underweight boys had a prevalence of 22.2% (70), while underweight girls had a prevalence of 16.2% (11). In comparison to girls, boys were more likely to be underweight (22.2% vs. 16.2%). Underweight boys

Table 1 Gender wise distribution of children studied.

Gender	Number of children	Percentage
Boys	316	82.3
Girls	68	17.7
Total	384	100

Table 2 Age wise distribution of children studied.

Age Group (Years)	Number of children	Boys	Girls
7-Jun	34 (8.9%)	30 (9.5%)	4 (5.9%)
8-Jul	47 (12.2%)	41 (13%)	6 (8.8%)
9-Aug	67 (17.4%)	52 (16.5%)	15 (22.1%)
10-Sep	38 (9.9%)	21 (6.6%)	17 (25%)
11-Oct	31 (8.1%)	18 (5.7%)	13 (19.1%)
12-Nov	38 (9.9%)	31 (9.8%)	7 (10.3%)
13-Dec	38 (9.9%)	35 (11.1%)	3 (4.3%)
13-14	44 (11.5%)	43 (13.6%)	1 (1.5%)
14-15	26 (6.8%)	25 (7.9%)	1 (1.5%)
15-16	11 (2.8%)	11 (3.5%)	0
16-17	6 (1.6%)	6 (1.9%)	0
17-18	2 (0.5%)	2 (0.6%)	0
18-19	2 (0.5%)	1 (0.3%)	1 (1.5%)
Total	**384**	**316 (82.3%)**	**68 (17.7%)**

were more prevalent in the age groups of 10-12 years and 14-15 years (14.3%), whereas underweight girls were more common in the age range of 8-9 years (45.4%).

Table 3 Prevalence of Stunting.

Age Group	Boys	Girls
7-Jun	16 (16.2%)	2 (6.9%)
8-Jul	6 (6.1%)	2 (6.9%)
9-Aug	11 (11.1%)	3 (10.3%)
10-Sep	3 (3%)	7 (24.15)
11-Oct	5 (5.1%)	6 (20.7%)
12-Nov	8 (8.1%)	3 (10.3%)
13-Dec	10 (10.1%)	3 (10.3%)
13-14	19 (19.2%)	1 (3.4%)
14-15	9 (9.1%)	1 (3.4%)
15-16	4 (4%)	0
16-17	4 (4%)	0
17-18	2 (2%)	0
18-19	2 (2%)	1 (3.4%)
Total	99 (31.3%)	29 (42.6%)

Table 4 Prevalence of Underweight.

Age Group	Boys	Girls
7-Jun	4 (5.7%)	1 (9.1%)
8-Jul	7 (10%)	1 (9.1%)
9-Aug	5 (7.1%)	5 (45.4%)
10-Sep	3 (4.3%)	2 (18.2%)
11-Oct	7 (10%)	2 (18.2%)
12-Nov	10 (14.3%)	0
13-Dec	10 (14.3%)	0
13-14	5 (7.1%)	0
14-15	10 (14.3%)	0
15-16	6 (8.6%)	0
16-17	2 (2.9%)	0
17-18	0	0
18-19	1 (1.4%)	0
Total	70 (22.2%)	11 (16.2%)

Prevalence of nutritional/other indicators

Other nutritional/other predictor shortages that have an effect on the nation's fitness, education, economy, and productivity (**Table 5**). A high percentage of instances may be avoided with appropriate and prompt intervention. Tooth decay (dental caries) is the result of acids produced by decay-causing bacteria in your mouth attacking the tooth's surface, or enamel. This may result in a cavity, which is a tiny hole in a tooth. Caries was found in 44 (11.5%) of the 384 children in our research, with the age group 11-12 years being the most prevalent (20.5%). Plaque, the clear coating of microorganisms that covers the teeth, must be removed to avoid cavities. Brushing your teeth twice a day and flossing at least once a day is the best method to achieve this. Dental hygiene also stimulates the gums, which aids in the prevention of gum disease in youngsters. Out of 384 youngsters, 280 (73.7%) do not clean their teeth, with the age range 8-9 years being the most prevalent (20.4%). A lack of iron Anemia is the most frequent nutritional deficit; anemia was found in 7 (1.82 percent) of the children in our research, and it was more prevalent in the age range 7 to 9 years (28.6%).

Vitamin A is important for eyesight because it keeps the cornea, or outer coating of the eye, clean. This vitamin is also found in rhodopsin, a protein found in your eyes that help you to see in dim light. Eyesight problems were found in 6 (1.6%) of the youngsters in our research, and they were more prevalent in the age groups of 12-13 and 15-16 years (33.3%).

Children's behavioral concerns may cause stress and frustration for the whole family. The most prevalent symptoms of vitamin C insufficiency in children are developmental or behavioral abnormalities. Mental irritability, laziness, and absence of mind were found in 57 (14.8%), 15 (3.9%), and 17 (4.4%) of the youngsters in our research, respectively.

Vitamin D insufficiency causes itchy skin. Vitamin D supplementation may aid in the treatment of such skin conditions. It may also help with rashes on the skin. Vitamin D is also helpful

Table 5 Prevalence of Nutritional/Other Indicators.

Age Group	Dental Issues		Anemia	Eyesight Weak	Behavior Issues			Itching	Ear Issues	
	Caries	Poor Dental Hygiene			Irritant	Laziness	Absence Mind		Discharge	Pain
7-Jun	2 (4.5)	23 (8.2)	1 (14.3)	0	0	1 (6.7)	0	0	0	0
8-Jul	4 (9.1)	39 (13.9)	2 (28.6)	0	4 (7.0)	7 (46.7)	4 (23.5)	2 (8.7)	0	0
9-Aug	7 (15.9)	57 (20.4)	2 (28.6)	0	1 (1.8)	6 (40.0)	1 (5.9)	2 (8.7)	0	0
10-Sep	3 (6.8)	30 (10.7)	1 (14.3)	0	3 (5.3)	0	0	1 (4.3)	0	0
11-Oct	5 (11.4)	19 (6.8)	0	0	8 (14.0)	0	1 (5.9)	1 (4.3)	0	0
12-Nov	9 (20.5)	29 (10.4)	1 (14.3)	1 (16.7)	6 (10.5)	0	3 (17.6)	3 (13.0)	1 (20)	0
13-Dec	6 (13.6)	30 (10.7)	0	2 (33.3)	11 (19.3)	0	4 (23.5)	5 (21.7)	1 (20)	1 (25)
13-14	4 (9.1)	26 (9.3)	0	1 (16.7)	11 (19.3)	0	3 (17.6)	3 (13.0)	3 (60)	3 (75)
14-15	3 (6.8)	16 (5.7)	0	0	8 (14.0)	0	0	4 (17.4)	0	0
15-16	1 (2.3)	4 (1.4)	0	2 (33.3)	4 (7.0)	1 (6.7)	1 (5.9)	1 (4.3)	0	0
16-17	0	5 (1.8)	0	0	0	0	0	0	0	0
17-18	0	2 (0.7)	0	0	0	0	0	0	0	0
18-19	0	0	0	0	1 (1.8)	0	0	1 (4.3)	0	0
Total	44 (11.5)	280 (73.7)	7 (1.82)	6 (1.6)	57 (14.8)	15 (3.9)	17 (4.4)	23 (6.0)	5 (1.3)	4 (1.0)

in the treatment of eczema, a skin disorder. Itching was seen in 23 (6.0%) of the children.

Hearing loss is linked to a lack of vitamin D. A vitamin D shortage may cause our bones to become weak and lose their ability to function properly, even the tiniest bones in our bodies. Osteopenia is the medical term for a disorder that may cause hearing loss or possibly deafness. In the age range 13-14 years, the prevalence of ear wax (1.3 percent) and discomfort (1.0 percent) was found to be considerable.

Conclusion

According to the findings of this report, rural school aged children in Punjab suffer from various levels of nutritional & health issues. These children's mothers should be informed about the benefits of a well-balanced diet. Cereals, pulses, green leafy vegetables, roots and tubers, sugar and jaggery, fats and oil, milk and milk products, bananas, and other foods should all be encouraged. The government should implement inexpensive yet safe food literacy campaigns including neighborhood engagement, NGOs, and other industries.

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