Health status of school age children employed in carpet weaving in Ganderbal Block

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ABSTRACT In a health and morbidity screening among 500 carpet weaving children and 450 children attending school selected at random in a rural field practice area the age group studied was from 6 to 16. Each child was thoroughly interviewed and examined for any deviation from health. The height and weight were taken by standard procedures and clinical assessment of morbidity and nutritional status was also observed. The results showed that the heights and weights of schoolchildren were greater than those of the carpet weaving children in both boys and girls. Clinically, 56% of the schoolchildren as against 41.6% of carpet weaving children had no nutritional defects. The main complaints in the carpet weaving children were in order of descent, headache, blurring of vision, backache, abdominal pain, limb pains, and respiratory tract infection. Both groups of children were later followed up for six months from September 1981 to March 1982. The incidence of subjective and objective deviations from health were higher in the carpet weaving than in the schoolchildren and the first ten major complaints in the carpet weaving children were respiratory tract infection, headache, backache, pain in the abdomen, injuries (major and minor), joint pains, diarrhoea and dysentery, fever of unknown origin, dermatitis, and chilblains.

The health status of children (6-16 years) engaged in carpet weaving in a rural area of Kashmir was compared with that of children attending school in the same area. A cross sectional study was conducted in the Ganderbal Block at a distance of 30 km from the Srinagar Medical College and a longitudinal morbidity study was conducted in the same place and on the same children from September 1981 to March 1982. A random sample of 500 school age children was selected from the carpet weaving group and another sample of 450 children was selected at random from the schools in the same area to act as a control group.

Because of the overall problem of poverty the children in Kashmir are made to work in the weaving centres at an early age, despite restrictions under the Indian Factories Act. This being a tender age in the context of repercussions on health due to the postural and exhaustive working conditions, a study of this type was thought desirable as no such study had been attempted in the past in this part of the country.

Material and methods

The 83 carpet weaving centres in Ganderbal Block were serially listed and every fifth centre was selected and all the workers aged from 6 to 16 were taken for study. Those children having less than six months exposure were withdrawn from the study: 450 children attending school in the same age group were selected at random from eight schools in the area. Each child was thoroughly interviewed and examined and whenever possible additional information was obtained from the parents of the child. The schedule was made and pretested. The anthropometric measurements were taken by standard methods as recommended by Jelliffe.¹ The morbidity evaluation was based on history, general physical examination, and systemic examination supported by clinical investigations. Each child was visited every 15 days during the longitudinal study period of six months and all the deviations from health, subjective or objective, were recorded for the last 15 days and any sickness occurring within the period of 15 days was recorded as one spell of sickness.

Table 1 (a) Average height (cm)

Age (years)	Boys				Girls			
	Carpet industry		School		Carpet industry		School	
	Average height	Growth rate (% age)	Average height	Growth rate (% age)	Average height	Growth rate (% age)	Average height	Growth rate (% age)
6	—	—	—	—	104.9	—	105.5	—
7	115.4	—	114.2	—	109.3	4.2	108.8	3.1
8	119.6	4.5	118.4	3.7	113.7	4.0	114.8	5.5
9	124.2	3.8	123.6	4.4	119.6	5.2	121.2	5.6
10	129.8	4.5	129.6	4.9	125.3	4.8	126.1	4.0
11	133.6	2.9	135.8	4.8	132.4	5.7	131.5	4.3
12	137.6	3.0	140.3	3.3	137.7	4.0	136.3	3.7
13	142.3	3.4	145.2	3.5	142.4	3.4	142.5	4.5
14	146.8	3.2	150.8	3.9	146.8	3.1	146.5	2.8
15	150.9	2.8	154.6	2.5	150.5	2.5	151.4	3.3
16	154.6	2.5	159.4	3.1	151.2	0.5	152.5	0.7

Table 1 (b) Analysis of variance

Sources of variation	Boys					Girls				
	DF	SS	MS	F	p	DF	SS	MS	F	p
Due to age	9	3858.55	417.62	158.79	<0.001	10	5622.61	562.26	1313.69	<0.01
Type of activity	1	14.62	14.62	5.56	<0.05	1	0.49	0.49	1.14	>0.05
Error	9	23.66	2.63			11	4.71	0.428		
Total	19	3796.83				21	5627.81			

Table 2 (a) Average weight (kg)

Age (years)	Boys		Girls	
	Carpet industry	School	Carpet industry	School
6	—	—	14.0	15.1
7	17.8	18.0	15.5	16.4
8	20.2	20.2	17.3	18.9
9	22.4	22.8	20.2	21.6
10	24.2	25.4	23.0	23.1
11	27.4	28.6	25.4	25.7
12	29.3	30.9	27.6	28.0
13	31.3	36.0	31.1	32.2
14	34.1	39.7	35.7	35.3
15	38.2	41.9	40.3	40.6
16	41.2	44.1	42.4	44.0

Table 2 (b) Analysis of variance

Sources of variation	Boys				Girls			
	DF	SS	MS	F	DF	SS	MS	F
Type of activity	1	23.117	23.117	0.31	1	3.21	3.21	0.03
Error	18	1315.933	73.10		20	1900.36	95.01	
Total	19	1339.05			21	1903.57		
p > 0.05 insignificant					p > 0.05 insignificant			

Table 3 Distribution of children by clinical assessment of nutritional status

Nutritional status	Nutritional defects detected	Carpet weaving children		Schoolchildren	
		No	%	No	%
I Normal	No defects	208	41.60	252	56.00*
II Abnormal	Eyes				
	Pale conjunctiva	288	57.60	185	41.00*
	Mouth				
	Angular stomatitis	187	37.40	54	12.00*
	Hair				
	Lack of lustre	27	5.40	9	2.00
	Tongue				
	Atrophic papillae	23	4.60	18	4.00
	Nails				
	Platynychia	18	3.60	0	0.00
	Skin				
	Dry	13	2.60	5	1.11
	Gums				
	Spongy and bleeding	11	2.20	—	—

One child may be represented more than once.

*Statistically significant at the 5% level.

Observations

ANTHROPOMETRY TABLES

Height—The height of the carpet weaving children, both girls and boys, was overall less than that of the controls. There was a retarding tendency in the rate of growth (development), especially in the boys. The analysis of variance test applied on average estimates also depicts a significant departure at $p < 0.05$ as shown in tables 1(a) and (b).

Weight—Regarding weight estimates no such tendency was observed despite the fact that higher weights were observed among the control children as shown in tables 2(a) and (b).

Nutritional status—The clinical assessment of nutritional status (table 3) showed that 41.6% of the carpet weaving children had no sign of nutritional deficiency as against 56% of the control children. This difference was found to be statistically significant at the 5% level.

Conjunctival pallor was the most common sign of

nutritional deficiency seen in both groups of children, being present in 57.6% of the carpet weaving children and 41% of the controls. Similarly, angular stomatitis was observed in 37.4% of the carpet weaving children but in only 12% of the schoolchildren. This difference was statistically significant at the 5% level. Other signs such as lack of lustre in hair and atrophic papillae on the tongue were also found in both groups but more often in the carpet weaving than the control children.

The prevalence of presenting complaints in the cross sectional study (table 4) showed that headache, blurring of vision, backache, abdominal pain, limb pains, and respiratory tract infection were the major complaints and the prevalence rate of these diseases differed significantly between the two groups ($p < 0.05$).

While reviewing the period of exposure, it has been observed that vision, headache, and limb pain were experienced comparatively much earlier than backache and respiratory tract infection. Whereas in the

Table 4 Children by presenting complaints and exposure to the activity

Present complaints	Carpet weaving children		Schoolchildren	
	Prevalence rate	Average period of exposure (years)	Prevalence rate	Average period of exposure (years)
Headache	28.8	2.1	8.00	7.3
Blurring of vision	23.4	2.9	4.00	7.3
Backache	21.6	6.1	1.00	8.7
Pain in abdomen	14.2	3.2	12.00	4.4
Limb pains	8.4	2.2	8.00	1.6
Respiratory tract infection	11.8	5.4	5.00	1.9
All types	58.00	3.6	35.00	4.3

One child may be represented more than once.

Table 5 Carpet weaving children by number of defects and period of exposure

Period of exposure (years)	No of defects					Total
	0	1	2	3	≥ 4	
-2	23	28	14	2	0	67
2-3	24	48	36	12	3	123
3-4	18	36	32	17	7	110
4-5	15	20	26	23	18	102
5-6	9	8	15	14	7	53
≥ 6	7	6	13	14	5	45
Total	96	146	136	82	40	500

schoolchildren defects of vision and headache occurred after a mean time at school of 4.3 years, in the carpet weaving children such complaints affected them on average 3.6 years after they started work. The carpet weaving children were further analysed by period of exposure and number of physical defects (table 5). The average period of exposure was 3.67 ± 1.48 years against an average number of defects of 1.61 ± 1.32 . The analysis showed an increasing number of defects with an increase in the duration of exposure. The relation between the factors was statistically significant with a positive co-relation ($r = +0.36$).

Personal hygiene

Personal hygiene was unsatisfactory in both groups; whereas satisfactory hygiene in the schoolchildren varied from 5% to 9% of children, in the carpet weaving group it varied from 0.2% to 3%.

When the results of the longitudinal morbidity study were analysed, it was found that the first ten causes of morbidity among both groups of children were: respiratory tract infection, headache, backache, abdominal pain, injuries (minor and major), joint pains, diarrhoea and dysentery, fever of unknown origin, dermatitis, and chilblains (table 6). A higher incidence was found in the carpet weaving children for headache, backache, injuries, and joint pains; in the schoolchildren a higher incidence was found for headache, diarrhoea, and dysentery. The preponderance of backache, joint pains, and headache in the carpet

weaving children may be attributed to the working conditions such as squatting on the floor, stooping, and constant gazing at their work for long periods. The increase in respiratory tract infection in both groups is because this survey was conducted during the winter months when respiratory tract infection is on the increase owing to the dry cold weather in Kashmir.

The abdominal pain found in both groups is due to the high prevalence of worm infestations which has been observed in many studies and is attributed to bad personal and environmental hygiene. The high incidence of headache and defects in vision, as shown in this survey, could be attributed to a lack of proper illumination in the carpet weaving centres and schools in the rural areas of Kashmir. Most are located in Katchha and are ill ventilated and badly illuminated rooms in mud buildings.

The slightly higher incidence of diarrhoea and dysentery in the schoolchildren is due to the intake of unhygienic food sold outside the schools by hawkers to whom the carpet weaving children have no access; the higher incidence of injuries in the carpet weaving children is attributed to their using sharp instruments in their work.

References

- Jelliffe D. B. *The assessment of the nutritional status of the community*. Geneva: World Health Organisation, 1966: 50-69, 76-8. (WHO monograph series No 53.)

Table 6 Percentage incidence of first ten major diseases by spells of sickness

Illness pattern	Total spells of sickness		Incidence (%)	
	Carpet weaving children	Schoolchildren	Carpet weaving children	Schoolchildren
Respiratory tract infection	126	75	25.20	18.29
Headache	118	62	23.60	15.12
Backache	107	21	21.40	5.12
Pain in abdomen	103	95	20.60	23.17
Injury/minor and major	92	46	18.44	11.22
Joint pains	73	25	14.60	6.097
Diarrhoea and dysentery	49	58	9.80	14.15
Fever of unknown origin	39	37	7.80	9.02
Dermatitis	34	21	6.80	5.12
Chilblains	25	33	5.00	8.05