

A survey of the physical health status of pupils aged 10 - 14 years in Standards 3 - 5 at three schools in New Crossroads, near Cape Town in the Western Cape

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Although adolescence is most commonly associated with risk-taking behaviour, mortality due to poverty-related conditions is high among black African children aged 10 - 14 years. This paper describes a study carried out in October 1991 to assess the physical health status of 860 underprivileged pupils aged 10 - 14 years in Standards 3 - 5 at three schools in New Crossroads, near Cape Town. Data on nutritional status, age at menarche, blood pressure, eyesight, physical abnormalities, injuries and use of hospitals were obtained. The response rate was 90%. Of all the children, 7,2% were below the 5th percentile weight-for-age. The proportion of boys (13,1%) below the 5th percentile weight-for-age was significantly higher than that of girls (3,7%). Of all the children, 19,5% were below the 5th percentile height-for-age. The proportion of boys (24,4%) below the 5th percentile height-for-age was also significantly higher than that of girls (16,7%). The average age at menarche was 13 years, similar to that (12,8 years) reported for the UK. In 5% of the children, the diastolic blood pressure was > 90 mmHg and the findings show some increase with age. Red Cross War Memorial Children's Hospital accounted for 30,9% of hospital attendances. 'Chest' complaints (19,5%) were frequent reasons for consultations, while 15,2% of the children reported being injured, with car accidents (16,0%), fractures (27,5%) and burns (20,6%) being the most common injuries. It is suggested that the provision of a 24-hour day hospital will ease the load on the referral hospital, i.e. Red Cross War Memorial Children's Hospital. Social policy aimed at a safer environment will reduce the number of injuries and related physical disability.

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Between 1984 and 1986, 14,5% of deaths among black Africans aged 10 - 14 years were caused by poverty-related infectious and parasitic disease.¹ Adolescence, the relatively new term² for the second decade of life,³ is currently most commonly associated with risk-taking behaviour,⁴⁻¹⁰ although the physiological and cognitive changes that occur at this time were documented as early as the 5th century BC.¹¹ In South Africa, the effects on physical health status of being underprivileged cannot be stressed sufficiently. Even if South African adolescents prove to be as healthy as their counterparts in materially more advantaged countries, such as the USA and Britain,¹² baseline data are important at this time in the country's history to direct resources appropriately and to monitor the effects of future social and health care policy.^{13,14}

New Crossroads, near Cape Town, a township which captures much of the history of blacks in Cape Town,¹⁵⁻¹⁷ provides a particularly useful reference point to measure change. The study, carried out in October 1991, screened the physical health status of a group of black pupils aged 10 - 14 years. In consultation with Dr P. I. Lachman of the Child Health Unit, health status was defined on the basis of nutritional status, menarche, eyesight, blood pressure, observable physical abnormality, hospital attendance and injuries.

Research procedure

Target population

The research targeted 10 - 14-year-olds. Children in this age group, according to a household survey which preceded the study,¹⁸ were to be found largely in Standards 3 - 5. The earlier study also indentified socio-economic status to be similar at all three schools.

Children who were present on the day of the survey and for whom parents had given written consent were included in the sample. Pupils falling outside the 10 - 14-year age group but also in Standards 3 - 5 and who were present on the day of the research were surveyed, but the findings on these children are not included in this report. All children were referred to local health care services where necessary.

Informed consent and the research team

All parties to the research process, including the parents and the teachers, were involved in preparatory discussion to ensure that an informed written consent was obtained. The survey team was chosen to ensure both competence and easy communication. It comprised nine women, including four trained nurses, who had research experience and who were bilingual in English and Xhosa. The research team received 2 days of pre-survey training.

Physical parameters and their measurement

Nutritional status was measured on the basis of heights and weights. Heights and weights were determined by means of approximate standard methods. Heights were measured in the standing position. Children were weighed on bathroom

scales (Salter) in their standard basic school uniform (trousers and shirts for boys and tunics and shirts for girls) with shoes off. The scales were standardised with a known weight and by calibration after every 10th child.

Nutritional status was assessed on the basis of standards derived by the National Center for Health Statistics, USA.¹⁹ When the height and weight data used for comparing nutritional status of this sample with the reference sample are interpreted, the following problems should be borne in mind. Weight-for-height comparison was not possible for these age categories as the reference data are not available. Standard percentile distribution weight-for-age and height-for-age were only available for the 5th percentile and below.

Undernutrition was determined as a value below the 5th percentile: a measure below the 5th percentile weight-for-age indicated acute or current undernutrition;²⁰ a measure below the 5th percentile height-for-age indicated chronic or past undernutrition.²⁰ For the analysis of the data the χ^2 -test with Yates' correction for 2 x 2 comparisons was used to compare proportions of children below the 5th percentile for age and sex categories. A significance level cut-off point of $P = 0,05$ was used.

To ascertain menarche, the girls were asked, in private, whether they had commenced menstruating and if so, at what age.

Blood pressure was measured in the sitting position with a mercury baumanometer. The referral cut-off point was set at diastolic > 90 mmHg.

The eyesight of the children was screened with a Sneller chart. One eye at a time was tested at a distance of 6 metres. If a child wore spectacles, eyes were tested with spectacles on. Children were referred to relevant professionals if the result was 18/6 (inability to read the fourth of the seven lines of the chart).

With regard to hospital attendance, children were asked if they had ever attended hospital either as an inpatient or an outpatient; if so, when, for what reason and which hospital. No time limit was set on the children's recall. Hospital attendance investigated a broad profile of the more serious problems or those perceived as warranting professional help, as opposed to the more ordinary ailments which could be treated at home. Hospital records provided a basis whereby the children's responses could be verified if necessary. These services would also be the first-line for policy intervention should the results prove a need for this.

For the injury profile, children were asked to indicate if they had been injured during the 6 months preceding the survey and if so, to give the date and the type of injury.

To detect any abnormalities present at the time of the survey, the children were examined with clothes on and shoes off from head/face to foot, front and back. On the basis of the nurse's decision, children were referred if they were not receiving treatment or had not received treatment for the condition.

Results

Response and description of the sample

The response rate was 90,1%. In addition to absentees on the day of the survey, there were three refusals. The response rate was similar at all three schools — 87,5%,

88,4% and 93,4%. The results were calculated from 860 returns. The three schools made up the following proportions — 9,5%, 52% and 38,5%. The 3 standards made up the following proportions — Standard 3, 44,8%; Standard 4, 38,5%; Standard 5, 16,7%.

Of the sample, 37,2% were boys and 62,8% girls. The average age of the sample was 12,9 years. The 14-year-olds (Fig. 1) comprised 24,4% of the sample (41,9% boys, 58,1% girls); the 13-year-olds, 23,9% of the sample (39,3% boys, 60,7% girls); the 12-year-olds, 25,4% of the sample (39,5% boys, 60,5% girls); the 11-year-olds comprised 17,7% of the sample (30,3% boys, 69,7% girls) and the 10-year-olds, 8,6% (25,7% boys, 74,3% girls).

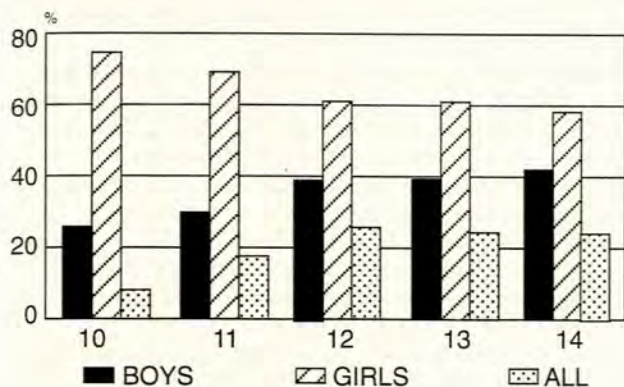


Fig 1. School health survey — age and sex profile.

Nutritional status

Weight-for-age

Of all children, 7,2% were below the 5th percentile weight-for-age. The proportion of boys (13,1%) below the 5th percentile was significantly higher than that of girls (3,7%). Weight-for-age was not statistically independent of sex ($\chi^2 = 16,558$; $P < 0,001$; $SD = 1$).

Of the 10-year-olds (Fig. 2), 2,7% were below the 5th percentile weight-for-age, as were 10,0% of 14-year-olds. Of the 10-year-old boys, 5,3% were below the 5th percentile weight-for-age, as were 18,2% of 14-year-old boys. Of the 10-year-old girls 1,8% were below the 5th percentile weight-for age, as were 5,3% of 12-year-old girls.

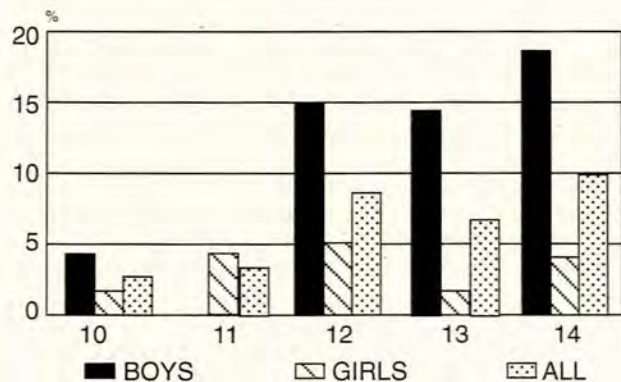


Fig. 2. School health survey — weight-for-age by age and sex.

Height-for-age

Of all children, 19,5% were below the 5th percentile height-for-age. The proportion of boys (24,4%) below the 5th percentile was significantly higher than that of girls (16,7%). Height-for-age was not statistically independent of sex ($\chi^2 = 4,985$; $P < 0,001$; $SD = 1$).

There was no marked variation between the age categories (Fig. 3) used on the basis of proportions of children below the 5th percentile height-for-age, although the proportion of 14-year-olds below the 5th percentile height-for-age (24,3%) is higher than that of younger children (14,5% of 11-year-olds and 18,9% of 10-year-olds). The proportion of boys below the 5th percentile height-for-age was highest for the 14-year-olds (37,5%). Among the girls, it was highest for the 13-year-olds (18,4%) and lowest for 14-year-olds (14,7%).

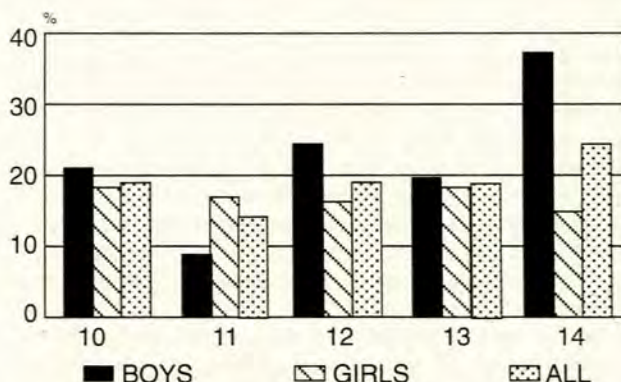


Fig. 3. School health survey — height-for-age by age and sex.

Menarche

Of the girls, 23,9% had reached menarche. The average age at menarche was 13 years. Those who had reached menarche at the time of the survey were, on average, 14 years old. In comparison, the average age of the girls for the sample as a whole was 12,8 years and for those who had not reached menarche 12,4 years. The proportion of girls who had reached menarche increased with age. None of the 10-year-olds had reached menarche; among the 11-year-olds, 0,9% had reached menarche; among the 12-year-olds 7,6%; among the 13-year-olds, 36%; among the 14-year-olds, 59,8%.

Blood pressure

For 5% of the sample, diastolic pressure was > 90 mmHg — 6,7% of the girls and 2,2% of boys. For 2,7% of the 10-year-olds, 2% of 11-year-olds, 6% of 12-year olds, 4,9% of 13-year-olds and 7,1% of 15-year-olds diastolic blood pressure was > 90 mmHg; 9,1% of girls aged 12 years and 10,7% of girls aged 15 years had diastolic blood pressures > 90 mmHg.

Eyesight

Of the sample, 0,6% wore spectacles. These were all girls. Of the sample, 7,4% scored > 6/6 on the Sneller eye chart with either the right or the left eye. Of the girls 7,8% scored > 6/6 as did 6,9% of the boys. Of the sample as a whole 5,1% scored 9/6 (68,7% of these scoring > 6/6); 1,5% of the

sample scored 12/6 (20,3% of these scoring > 6/6); 0,8% of the sample scored 18/6 (10,9% of these scoring > 6/6).

Physical abnormalities observed

Abnormalities were observed in 4,8% of the sample. The majority of these were skin complaints or problems, including rashes, ringworm, scars (burns and dog bites), acne, scabies, eczema and dermatitis (from washing powder). Others included certain physical disabilities as a result of injury and polio, some dental caries and broken teeth. The proportion of the sample presenting with abnormalities at the survey was similar across the age categories; 5,4% of the 10-year-olds; 4,6% of the 11-year-olds; 4,1% of the 12-year-olds; 4,8% of the 13-year-olds; 5,2% of the 15-year-olds.

Hospital attendance

Of the sample, 60,6% reported having attended a hospital, both as an in- and outpatient once; 10,6% remembered attending twice and 0,6% three times. The Red Cross War Memorial Children's Hospital accounted for 30,9% of attendances, the KTC Day Hospital for 18,2% and the Guguletu Day Hospital for 11,9%. Tygerberg Hospital accounted for 5,4% of attendances and Groote Schuur Hospital for 4,8%. Attendances at Nyanga and Old Crossroads Day Hospitals, Victoria and Conradie Hospitals in Cape Town and hospitals in the Eastern Cape attendance accounted for less than 3%.

The reasons for attending hospital were described by the children in terms of symptoms (44,3%), diagnoses (32,2%), injuries (21,7%) and as unknown (1,7%). The diagnoses and symptoms given by the children were categorised by system (see Appendix A for a detailed breakdown by system of the diagnoses and symptoms given by the children). The majority (19,5%) were 'cardiothoracic', including symptoms such as 'cough' and 'tight chest', and diagnoses such as tuberculosis, asthma, pneumonia and bronchitis. The 'ear, nose and throat' category comprised 17,8% of reasons for hospitalisation, with symptoms including 'earache' and 'sore throat' and the predominant diagnosis being 'tonsillitis'. Skin complaints comprised 16,0% of the reasons for hospital attendance, with rashes and carbuncles the predominant complaints.

For 29%, the year of hospitalisation was given as 1990, and for 21,9% as 1991 (the year of the survey). For 20,7% of once-only hospitalisations, the date was unknown. With regard to once-only hospitalisations, 8,2% were recalled for the years before 1987; 5,2% for 1987; 6,1% for 1988 and 8,8% for 1989.

Injuries

Injuries were reported as a reason for first hospitalisation by 13,1% of the children, and 18 children (2,1%) reported an injury during the preceding 6 months. Altogether 15,2% of the children reported being injured: 16% of these injuries were as a result of car accidents, 27,5% were fractures, 3,8% were dislocations, 20,6% were burns, 9,9% were lacerations, 6,9% were sprains and 9,9% the result of penetration.

Injuries were reported for 20,6% of the boys and 12,0% of girls. There was a slight increase with age: 12,2% of 10-year-olds reported an injury; 13,8% of 11-year-olds;

13,3% of 12-year-olds; 15,5% of 13-year-olds; and 19% of 14-year-olds.

Discussion

The response rate was high, suggesting a concern with health among the parents, the schools and the pupils; this probably also accounts for those areas of physical health status where problems were seemingly few.

With regard to the nutritional status findings, no correction for puberty has been undertaken.²¹ The following discussion of nutritional status should be seen in the light of this observation. Overall, acute undernutrition did not seem particularly high, but for boys (13,13%) it is of concern and older children seem worse off. Overall, chronic undernutrition was high (19,5%); again boys (24,4%) and older children, i.e. 14-year-olds (24,3%), were particularly badly affected. It is possible that the chronic undernutrition in these older children is a reflection of their childhood in Old Crossroads or similar informal settlements. Strict influx control prevented permanent settlement and circular migration between town and the Eastern Cape was essential for survival.²² Regular contact with the poverty of the Eastern Cape has been shown to have an incremental negative effect on chronic undernutrition.²³

The average age at menarche was 13 years, which is very similar to the 12,8 years reported for the UK²⁴ and the 13,4 years reported for Zimbabwe.²¹ Reports from the UK indicate a gradual trend toward earlier menarche from an average age of 16,5 years reported in 1840,²⁴ although the downward trend now appears to have been replaced by one in the opposite direction.²⁵ A Canadian study²⁶ speculates that this may be due to the trend that favours thin women who exercise, rather than a deterioration in health and environmental conditions.

High blood pressure in children has been of concern since that 1960s, given that hypertension may have its origins in childhood.²⁷ In South Africa, blacks are reported to be particularly at risk.²⁸⁻³⁰ Although the cut-off point for diastolic pressure selected for this study was lower than that suggested in the literature³¹ and a single measure is not diagnostic of a problem, there is cause for some concern. For 5% of the sample, diastolic pressure was > 90 mmHg and there was some increase with age. Among the 17-year-old boys who were surveyed, but whose results are not reported, 17,9% had a diastolic blood pressure > 90 mmHg.

The children with poor eyesight were referred for professional attention. However, ongoing related research³² suggests that backlogs in services are a greater problem than diagnosis. Professional services are also located largely in the city and transport is costly and time-consuming for parents.

The data on the use of hospitals would have been more meaningful if the study had included an assessment of the use of health care generally. By focusing primarily on hospitals, we wished to include a means of verification of responses if this were necessary. Attendance was highest at Red Cross War Memorial Children's Hospital, the referral hospital for New Crossroads. A similar tendency to utilise Red Cross was also noted for Mitchell's Plain.³³ As Lachman and Zwarenstein³³ note, the provision of 24-hour day hospitals will ease the after-hours load at referral hospitals.

The majority of the reasons for attending hospital were reported as symptoms (44,3%). Chest complaints, including coughs, were common, which is of concern given widespread tuberculosis in the Western Cape. As far as can be ascertained there is no procedure yet in place which screens for tuberculosis at schools, where many young people are accessible for preventive activities.¹

Injuries tended to be higher among boys and the percentage of those injured tended to increase with age. Burns (20,6%) are suggestive of social conditions, but most importantly, as others have found,³⁴⁻³⁷ road-related injuries were high. The scars and physical disability observed are unfortunate legacies of a largely preventable injury profile. Social policies aimed at creating a safer and more caring environment for children are long overdue.

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Appendix A

Symptoms and diagnoses by category

System	Symptom		Diagnosis		Total	
	No.	%	No.	%	No.	%
1. Cardiothoracic	55	70,51	23	29,49	78	19,55
2. Dental			16	100,00	16	4,01
3. Ear, nose and throat	32	45,07	39	54,93	71	17,79
4. Eyes	15	60,00	10	40,00	25	6,27
5. Gastro-intestinal	33	84,61	6	15,38	39	9,77
6. Genito-urinary	5	100,00			5	1,25
7. Neurological	13	72,22	5	27,78	18	4,51
8. Skin	40	62,50	24	37,50	64	16,04
9. Infectious fevers			31	100,00	31	7,77
10. General/miscellaneous	41	78,85	11	21,15	52	13,03
Total	234	58,65	165	41,35	399	100,00

Breakdown by category

Symptoms		Diagnosis		Symptoms		Diagnosis	
1. Cardiothoracic				7. Neurological			
Coughs	31	Tuberculosis	7	Fits	3	Epilepsy	5
Chest	9	Asthma	5	Headache	10		
Tight chest	10	Pneumonia	5	Subtotal	13	Subtotal	5
Influenza	2	Bronchitis	6				
High blood pressure	1			8. Dermatology (skin)			
Heart problems	2			Rash	18	Carbuncle	14
Subtotal	55	Subtotal	23	Sores	14	Ringworm	5
2. Dental				'Septic'	1	Scabies	2
		Tooth extraction	16	Pimples	6	Abscess	2
		Subtotal	16	Patches	1	Urticaria	1
3. Ear, nose and throat				Subtotal	40	Subtotal	24
Earache	15	Ear abscess	2	9. Infectious fevers			
Sore throat	8	Tonsillectomy	2			Chicken pox	22
Oozing ear	5	Tonsillitis	35			Measles	5
Nosebleed	2					Meningitis	2
Mouthbleed	1					Mumps	1
Lump — right ear	1					Polio	1
Subtotal	32	Subtotal	39			Subtotal	31
4. Eyes				10. General/miscellaneous			
Sore eyes	6	Eyesight	10	Fever	17	Rape	1
Itchy eyes	1			Swelling	16	'Poison' — right leg	1
Eye infection	1			Pain	5	Growth on neck	1
'Eye problems'	7			Stiffness	1	Allergy — penicillin	1
Subtotal	15	Subtotal	10	'Twisted face'	1	Jaundice	1
5. Gastro-intestinal						Surgery to cord	1
Stomach ache	25	Appendicitis	4			Surgery to fontanelle	1
Vomiting	4	Food poisoning	1			Tear gas	1
Diarrhoea	4	Worms	1	Subtotal	40	Plaster	1
Subtotal	33	Subtotal	6			Subtotal	9
6. Genito-urinary							
'Kidneys'	5						
Subtotal	5						