

School non-enrolment and its relation with health and schistosomiasis knowledge, attitudes and practices in rural Egypt

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عدم التدرّس (التحاق الأطفال بالمدارس)، وأثر ذلك على المعارف والمواقف والممارسات المتعلقة بداء البلهارسيا في ريف مصر
شاهيناز مخيمر، مها طلعت

الخلاصة: يُحرّم الأطفال الذين لا يلتحقون بالمدرسة من العلاج من داء البلهارسيا الذي يقدم ضمن البرامج الصحية المدرسية. وقد قامت الباحثتان باستقصاء العوائق التي تحول دون تدرّس الأطفال والتعرّف على درجة المعارف الصحية وعلى المواقف والممارسات فيما يختص بداء البلهارسيا، وذلك في 58 طفلاً مُتدرّساً و41 طفلاً غير مُتدرّس، إضافة إلى 80 من الكبار، في قرية تقع في محافظة الفيوم بمصر. وقد تبين أن العوامل الاقتصادية والثقافية والنظام المدرسي نفسه تمثل حواجز وعوائق في هذا الخصوص. كما كان مستوى تعليم الأمهات دور كبير في عملية تدرّس الأطفال. وقد كان الأطفال غير المتدرّسين يعانون من فقر الدم أكثر من الأطفال المتدرّسين. كما ظهرت عليهم أعراض عوّز الفيتامينات أكثر من المتدرّسين. ومن جهة أخرى، كان وعي الأطفال المتدرّسين ومعارفهم عن داء البلهارسيا ومواقفهم تجاهه أفضل، ولو أن ممارساتهم حيال هذا المرض لم تكن كذلك. وكان معدل الإصابة بعدوى البلهارسيا المنسوية لدى الأطفال في كلتا المجموعتين مرتفعاً (51.7% لدى الأطفال المتدرّسين و65.8% لدى غير المتدرّسين). وترى الباحثتان أنه لا بد من معالجة السياسات التعليمية والصحية للحواجز التي تُعوق التدرّس (التحاق الأطفال بالمدارس).

ABSTRACT Children who are not enrolled in school are deprived of schistosomiasis treatments delivered through school health programmes. We explored perceptions of barriers to school enrolment and health and schistosomiasis knowledge, attitude and practices among 58 enrolled and 41 non-enrolled children and 80 adults in a village in El-Fayoum governate, Egypt. Economic factors, cultural factors and the school system were perceived as barriers. Maternal education had a significant role in enrolment. Non-enrolled children were more anaemic and had more signs of vitamin deficiency. Enrolled children had better schistosomiasis knowledge and attitudes, but not practice; both groups had high *Schistosoma mansoni* infection rates (51.7% enrolled and 65.8% non-enrolled). Education and health policies should tackle perceived barriers. Introduction

La relation entre la non-scolarisation et les connaissances, attitudes et pratiques concernant la schistosomiase dans l'Égypte rurale

RÉSUMÉ Les enfants qui ne sont pas scolarisés ne bénéficient pas des traitements de la schistosomiase qui sont administrés dans le cadre des programmes de santé scolaires. Nous avons étudié la perception des obstacles à la scolarisation ainsi que les connaissances, attitudes et pratiques concernant la schistosomiase chez 50 enfants scolarisés, 41 enfants non scolarisés et 80 adultes dans un village du Gouvernorat de Fayoum en Égypte. Les facteurs économiques, les facteurs culturels et le système scolaire étaient perçus comme des obstacles. L'éducation de la mère jouait un rôle significatif dans la scolarisation. Les enfants non scolarisés souffraient plus d'anémie et présentaient plus de signes de carence vitaminique. Les enfants scolarisés avaient de meilleures connaissances et attitudes concernant la schistosomiase, mais pas de meilleures pratiques ; les deux groupes avaient un taux élevé d'infestation par *Schistosoma mansoni* (51,7 % pour les enfants scolarisés et 65,8 % pour les non-scolarisés). Les politiques d'éducation et de santé devraient s'attaquer aux obstacles perçus.

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School-age children experience a considerable burden of diseases that may have both immediate and long-term consequences for their health, growth and education [1]. In developing countries, much morbidity has been attributed to infectious and parasitic helminth infections, especially schistosomiasis [2–4]. Enrolled children usually have better health as they have access to health services through school-based health programmes that provide excellent opportunities for early detection and treatment of infectious and parasitic diseases [3–7].

Following this approach, the Egyptian Ministry of Health and Population delivers schistosomiasis treatment to students. Efforts have been jeopardized in areas where non-enrolment rates are high; these areas are also characterized by high prevalence and intensity of infection. Previous studies in Egypt have documented poor school attendance with marked variations by gender and location and a high proportion of infected non-enrolled children who miss schistosomiasis treatment [7,8]. Few students have explored the reasons for non-enrolment from economic, cultural and health perspectives, although the importance of these factors in developing countries has been acknowledged [9].

The aim of our study was to explore parental factors and barriers to enrolment and to identify the health status and schistosomiasis knowledge, attitude and practice (KAP) among enrolled and non-enrolled children.

Methods

El-Fayoum governorate, a large oasis in the Egyptian Western Desert that is 90–130 km southwest of Cairo, was selected for our study because of its low rate of school enrolment (38%) [10,11]. Within the El-Fayoum districts, El-Bitar, an *ezba*, or small

village, was chosen because it has the lowest rate of enrolment (9.4%) and the highest *Schistosoma mansoni* prevalence (26.4%) [10,11]. El-Bitar is a small satellite community with 80 houses and 570 inhabitants. It is crossed by 2 canals, has no drainage system and has no rural health unit. There is 1 preparatory school with 446 students who primarily come from nearby villages.

Both quantitative and qualitative data were collected from the school and the village. Results are given as frequencies or means (standard deviations).

School health survey

Children were screened at the only preparatory school in the satellite where the district laboratory technician performed stool examination, blood testing and schistosomiasis treatment. Schoolteachers, the district senior laboratory technician, community leaders and the enrolled children were enlisted to recruit non-enrolled children. Trained social workers interviewed the children and with the help of a public health consultant, focus group discussions and physical examinations were conducted.

Using statistical methods, a random sample of 58 children enrolled in the school and aged between 12 and 13 years were selected. During a 4-month period 41 non-enrolled children in the same age group complied and were included in our study. Both groups were interviewed in a structured interview to explore their parents' characteristics and to measure their schistosomiasis KAP. They were medically examined for height, weight and signs of vitamin deficiency (angular stomatitis and depigmentation) and blood and stool samples were analysed with parental consent. A total of 5 focus group discussions were conducted (2 among the non-enrolled and 3 among the enrolled) exploring their percep-

tions of health, education and the link between them.

Villager survey

The socioeconomic background and reasons for not enrolling children in school of all participating villagers were collected with a structured questionnaire. A total of 7 focus group discussions were held (4 mother and 3 father groups) to explore parental perceptions about health and education.

There was no attempt to relate the school health survey and the villager survey as most enrolled children came from nearby villages and the perceptions of close communities might not differ.

Results

School health interviews

Most fathers of enrolled and non-enrolled children were farmers (77.6% enrolled and 87.8% non-enrolled, $P > 0.05$) and most mothers were housewives (93.1% enrolled and 85.4% non-enrolled). Most non-enrolled children were significantly characterized by illiterate mothers compared with the enrolled group (95.1% non-enrolled and 74.1% enrolled, $P < 0.05$). Family size in both groups was high [enrolled 6.2 (SD 2.4) people and non-enrolled 7.0 (SD 2.3) people, $P > 0.05$].

Most enrolled (91.4%) and non-enrolled (100.0%) children knew the modes of transmission of schistosomiasis. Less than half of each group (32.7% enrolled and 41.5% non-enrolled) identified blood in the urine as a symptom but blood in the stool was not mentioned even once. Nearly half (43.9%) of the non-enrolled and 24.1% of the enrolled incorrectly identified treatment ($P < 0.05$). The enrolled differed significantly in their knowledge of complications from the non-enrolled (44.8% and 17.1%

respectively, $P < 0.05$). Knowledge of complications was considered present if the child could name 1 complication of schistosomiasis. Nearly half of both groups said television was their source of knowledge (enrolled 55.2% and non-enrolled 58.5%); only 15 (25.9%) of those enrolled said school was the source of their knowledge.

Most children in both groups believed that treatment can cure (non-enrolled 95.1% and enrolled 100.0%), but the non-enrolled believed more in re-infection (87.8% and 0.0% respectively, $P < 0.05$). The enrolled had a stronger sense of responsibility in acquiring the infection whereas the non-enrolled believed that infection was determined by destiny (70.7% and 51.2% respectively, $P < 0.05$).

Most enrolled and non-enrolled children reported using canal water, mostly for farming, playing and fishing.

Table 1 shows the health status of the enrolled and the non-enrolled children. The non-enrolled children had a lower mean blood haemoglobin count than the enrolled [11.6 (SD 1.2) and 10.6 (SD 1.1) g/dL respectively, $P < 0.05$], weighed more than the enrolled [42.0 (SD 10) kg and 37.7 (SD 8) kg, $P < 0.05$] and exhibited more signs of vitamin deficiency. No differences were detected in *S. mansoni* infection, which was high in both groups (65.8% non-enrolled and 51.7% enrolled, $P > 0.05$).

Most children related health to cleanliness and some non-enrolled children identified health as a means of getting a job. Some attributed good health to the increased number of hospitals and some others attributed the deterioration of health conditions to pollution and to the poor quality of health services.

Most children from both groups perceived those who were enrolled in school as having better health because they were

Table 1 Comparison between the health status of the enrolled and the non-enrolled children

Variable	Enrolled (n = 58)		Non-enrolled (n = 41)		P-value
	Mean	SD	Mean	SD	
Age (years)	13.4	1.5	13.7	1.3	> 0.05
Weight (kg)	37.7	8	42	10	< 0.05
Height (cm)	146	10	148	10.2	> 0.05
Blood haemoglobin (g/dL)	11.6	1.2	10.6	1.1	< 0.05
	No.	%	No.	%	
Depigmentation	19	33.3	33	80.5	< 0.05
Angular stomatitis	20	34.5	24	58.5	< 0.05
<i>Schistosoma mansoni</i> infection	30	51.7	27	65.8	> 0.05

P < 0.05 is significant.

*SD = standard deviation.

cleaner and did not work in the fields as the non-enrolled children did. Only one enrolled child attributed better health of the enrolled to the health awareness provided in schools.

The enrolled children complained about health services and doctors were described as reluctant and often absent. Schistosomiasis treatment was perceived as useless and "does not cure". Some non-enrolled children believed in the cure effect of treatment.

Both groups perceived the importance of education for the same reason, that is, the ability to read and write and to have a professional career, such as doctor, engineer or lawyer.

The majority of both groups of children identified school fees as a barrier to enrolment. Some enrolled children mentioned as barriers that the child himself might not like education, overcrowding of children in the classroom and parental unawareness of the importance of education. Some non-en-

rolled children attributed non-enrolment to their parents' need of child labour, to the unemployment facing those educated and to the attitudes of teachers who beat children at school.

Most enrolled children mentioned that the decision to enrol is made by fathers and mothers together; the non-enrolled children said the father made the decision.

Both groups preferred not to educate girls and the reasons given were primarily due to the perceived cultural role of girls in later life, i.e. marriage and helping her husband (but not contributing financially to her family). Very few mentioned that parents protected their girls by not sending them to school. Very few mentioned that educating girls was preferable to educating boys as boys could work even if they are not educated.

Most respondents mentioned that those who are educated are cleaner and can take better care of their health.

Villager interviews

The majority of villagers (80% of men and 90% of women) were illiterate. More than two-thirds of the men were farmers who primarily worked as day labourers. Only one-quarter were owners of their land. As for women, 50 (62.5%) were housewives and 35% were agricultural workers.

Almost all interviewed (73 or 91.2%) stated economic problems were the main barriers to school enrolment. They reported that the average school fees for primary education was 18.2 (SD 6.7) Egyptian pounds (LE) and 28.9 (SD 10.8) LE for secondary school education (US\$ 1 was about LE 4–5 at the time of the study). The total average additional yearly cost for school uniforms, books and stationary was 195 (SD 40) LE. Other barriers mentioned were the need for the children to generate income, large family size and parental illiteracy (18.7%, 12.5% and 8.6% respectively).

All interviewed stated that education is important. A total of 66.3% mentioned that education of boys and girls are both important, but 21.3% stated that educating boys is more important. Nearly 80% said that enrolment leads to better health.

Most mothers and very few fathers perceived cleanliness and proper food to be related to good health. Few mothers expressed education and upbringing as related to good health.

Factors affecting child health were discussed and diarrhoea and fever were perceived as common problems by most respondents. More fathers than mothers reported being concerned about schistosomiasis and cholera. Most respondents perceived schistosomiasis as a serious problem because it causes renal failure and cancer. When discussing factors leading to ill health, most mothers and fathers mentioned canal water pollution by sewage dis-

posal and pesticides, large family size and high costs of medical care.

Most respondents preferred to use private doctors, then general hospitals and lastly health centres. A few fathers sometimes used traditional remedies and bought drugs without prescriptions from pharmacies. One father mentioned that he did nothing for sick children, but rather, he said: "We leave him to his destiny".

Most respondents agreed that the quality of health care provided is unacceptable. Doctors' attitudes were the main obstacle. Doctors were described as careless, not regularly available and lacking the skills to perform proper physical examinations. Health centre laboratory investigations were perceived as inaccurate and not seen by doctors. Medications were described as unavailable and unaffordable. Some said that: "Schistosomiasis treatment is not always available in the health centres, so we buy it from pharmacies". Accessibility was also identified as a barrier because some had to travel to reach health centres.

Most respondents, regardless of gender, said that education is important as it enables children to read the Quran and to write. Most mothers said that cleanliness was a benefit of education, whereas fathers referred to cleanliness as a way of getting a job. Both groups identified problems they encountered with the education system that made the importance of education questionable. One mother reported: "There is no education in schools". One father said: "The number of schools is not enough, the level of education is below zero and more than 60 pupils are in one class".

Both groups said costs including school fees, unemployment after graduation and loss of child labour were barriers to enrolment. All respondents complained of high school fees and extra expenses for private lessons, books, uniforms and transporta-

tion. Unemployment shaped parental opinion about the enrolment decision as some parents, especially fathers, commented on the absence of an incentive for education. One father said: "Education is expensive and afterwards children will not find jobs with their diplomas". Another said: "It is better for a child to learn a skill, because there are no jobs after finishing schools. They don't earn money by education".

Child labour was seen as another barrier. Most respondents explained that children who do not attend school help their parents in the fields or that they look for other jobs to support their families. A few mothers said that those who attend school do not help their parents because they become exhausted after the long school day. Large family size was the reason behind financial constraints for some.

Cultural barriers were expressed in various ways that included gender discrimination. Preference to enrol boys was clear among both fathers and mothers. Boys were seen as future supporters of the family, because after marrying, boys still help with family expenses. Girls' education was seen as useless and some said: "Educating girls is a loss of investment. We also fear mixing our girls with boys at certain age. They should marry early and learn all kinds of domestic work before marriage". Another cultural barrier emphasized by parents was the availability of schools only in the afternoon, which was perceived as an inconvenient time for girls to go out. While the minority viewed education of boys and girls as equal, a very few mothers said that girls' education is more important than boys' education and the reason given was the perceived higher intelligence of girls than boys. Most respondents across the focus group discussions stated that the decision to enrol was made by the father

alone. A minority referred to the role of grandfathers as decision-makers.

Whereas finances were the main barriers expressed by fathers, mothers raised the issue of educational system as the main obstacle to enrolment. Most mothers blamed teachers as the main reason for dropouts. One mother reported: "Our children are afraid to go to school because they are beaten by their teachers and they hate going to school". In addition, schools do not accept all children because only limited numbers can be accepted each year and because of age constraints. One mother said: "Because my child was less than 6-years-old by a few days, they postponed him to the following year and then a year later they refused him because he was older than the age required". Both mothers and fathers found that the new system of the long day of education was inconvenient from many aspects. Fathers expressed: "There is no toilet, no clean drinking-water and no activities during the recreation break which takes almost 1 hour. When the school day is prolonged, children get exhausted and they do not help us after returning so they become a burden on their families".

Apart from financial barriers and large family size, a few parents mentioned child preference as decision factors.

Mothers and fathers saw the relation between health and education differently. Some mothers said that school enrolment and education lead to better health because of the availability of health care at schools, teaching cleanliness so that children can take better care of their health and learning so that children can understand medical prescriptions. Confirming this opinion, mothers stressed that the health of children in schools is better. Very few mothers mentioned that children who do not attend

school have better health as they eat better, rest at home and do not travel or walk long distances to school. Some others stated that better health could lead to better education achievements. Fathers' perceptions about the relationship between education and health were not as strong as mothers' perceptions. A minority of fathers stated that health and education are unrelated and that health is in the hands of God. Most fathers, however, said: "Healthy brains are in healthy bodies".

Discussion

Non-enrolled children are deprived of the educational and the health benefits offered by schools. Many studies have provided evidence that the health of enrolled children is better than the health of the non-enrolled [3,12]. Our findings are similar in that the non-enrolled had a lower mean blood haemoglobin count and showed more signs of malnutrition.

In spite of the schistosomiasis treatment provided in schools, both enrolled and non-enrolled children had high levels of *S. mansoni* infection. Schistosomiasis KAP among enrolled and non-enrolled children varied. Both groups had correct knowledge about modes of transmission but that did not prevent them from coming into contact with canal water. The source of knowledge for both groups was mainly television. Neither group identified blood in the stool as a sign of *S. mansoni* infection. Non-enrolled children differed from enrolled children in not comprehending its seriousness, in their greater belief in re-infection and in their belief that infection was beyond their control. This differed from the enrolled children who acknowledged responsibility in acquiring the infection.

As documented elsewhere, parents are the decision-makers for children's health

and education. Family background variables such as education and parental occupation influence their decisions for their children's enrolment [13–17]. Similarly, low enrolment rates in our village (10%) were related to a high parental illiteracy rate, large average family size and the high proportion of fathers working as day labourers and farmers, which denoted low socioeconomic standards. Among these factors, maternal education was the most significant related to enrolment and denoted the effect of maternal illiteracy in the decision of nonenrolment. This finding is similar to the World Bank report on gender and wealth in that the education of adults in the household significantly affects the enrolment of children and that the effect of adult female education is greater than that of males [18]. Although many studies have shown that female education is related to better health, smaller family size and more educated children, female non-enrolment rates are still high [18]. Our study highlighted the role of cultural barriers to female enrolment as in many cultures where gender preference plays a major role [15]. Parents perceived boys as economic assets to the family and as contributing to productive labour, but saw girls as a burden and a waste of investment as they marry early and their economic productivity was seen to benefit to their husband's family rather than their parents. Hence, anticipation of future female gender roles explained to some extent gender differences in educational choices made by parents. Unfortunately, gender differences in education continue to be very strong elsewhere as well [3,13,15,19].

Apart from cultural barriers to enrolment, our study detected financial and education system obstacles to child enrolment as perceived by parents and children. The poor financial capacity of families to pay

for extra school charges such as school fees, textbooks, school uniforms and private lessons and the high unemployment situation facing graduates were all identified financial barriers. Perceived educational system barriers included: the limited number of children accepted in schools; negative attitudes of teachers including beating, poor teaching methods and forcing children to take private lessons; overcrowding of children in the classrooms; afternoon schooling system that interferes with female enrolment; long distances to walk to schools; and the long exhausting schooldays that interfere with the economic contribution of the children.

Mothers and fathers perceived the importance of education differently. Mothers wanted their children to go to school to become cleaner and healthier. Fathers perceived the importance of education in obtaining a job; for fathers, unemployment after schooling was a hindering factor. Most fathers did not perceive the benefit of the school health programmes and they accused the health care delivery system of being reluctant.

In contrast to the literature, in our study the health of the non-enrolled children was perceived by some parents to be better than the enrolled. The reasons mentioned were that the non-enrolled have more free time, they do not expend effort studying and travelling to and from school and they eat and rest better [3,5,6,20]. This perceived difference could also be due to the higher weights of the non-enrolled children. Surprisingly enough, children's ill health was an indicator of parental decisions to enrol because of the perception that they were unable to contribute to economic productivity. This opinion contradicted what has

previously been documented, i.e. that poor health status of the child delays the decision to enrol [14].

Conclusion

For successful implementation of school health programmes, active cooperation of the health and education sectors is required. A partnership is also needed between governments and communities to explore community needs and perceptions. Suggested policies to increase access and attainment of schooling have included increasing female access, adopting culturally sensitive strategies, improving the health of school-age children and decreasing the health gap between enrolled and non-enrolled children. Female empowerment and involvement in income generating activities will benefit the whole of the next generation. Also, because fathers are the main decision-makers for their children's educational and health choices, it is of utmost importance to involve them in women's and children's health programmes.

School health promotion programmes need to be implemented to help change the behaviours of those enrolled.

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Expanding schistosomiasis-free areas

Worldwide, over 200 million people are infected with schistosomiasis. Groups particularly at risk are children and adolescents, and special occupation groups such as fishermen and irrigation workers. In the short term, the infection causes general debilitation that can seriously affect children's school attendance and performance, and the work capacity and productivity of adults. In the Eastern Mediterranean Region, 11 countries are free of schistosomiasis, i.e. no local transmission occurs, and another 7 countries have limited local transmission. The disease is endemic in only 4 countries: Egypt, Somalia, Sudan and Yemen. In our Region, and elsewhere, the introduction of praziquantel in the 1980s as part of integrated control programmes demonstrated the effectiveness of the drug. Our goal is to facilitate this progress, and expand the disease-free areas as far as possible. In addition to the 11 countries that are already disease-free, the 7 countries that have limited transmission at present will soon be disease-free. Many people living in the 4 countries where schistosomiasis is still endemic will also soon enjoy life without this old disease.

Source: Annual Report 2004: the way forward: Division of Communicable Disease Control. Cairo, World Health Organization Regional Office for the Eastern Mediterranean, 2005.