

# Determinants of health-seeking behaviour for schistosomiasis-related symptoms in the context of integrating schistosomiasis control within the regular health services in Ghana

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## Summary

Morbidity control of schistosomiasis through integration within existing health care delivery systems is considered a potentially sustainable and cost-effective approach. We conducted a questionnaire-based field study in a Ghanaian village endemic for both urinary and intestinal schistosomiasis to determine whether infected individuals self-reported to health centres or clinics and to identify factors that influenced their decision to seek health care. A total of 317 subjects were interviewed about having signs and symptoms suggestive of schistosomiasis: blood in urine, painful urination, blood in stool/bloody diarrhoea, abdominal pain, diarrhoea, swollen abdomen and fatigue within 1 month of the day of the interview. Fever (for malaria) was included as a disease of high debility for comparison. Around 70% with blood in urine or painful urination did not seek health care, whilst diarrhoea, blood in stool, abdominal pain and fever usually led to action (mainly self-medication, with allopathic drugs being used four to five times more often than herbal treatment). On average 20% of schistosomiasis-related signs and symptoms were reported to health facilities either as the first option or second and third alternative by some of those that self-medicated. A few of those who visited a clinic or health centre as first option still self-medicated afterwards. Children under 10 years and adults were more likely to seek health care than teenagers. Also, females were more likely to visit a health facility than males of the same age groups. Socio-economic status and duration of symptoms did not appear to affect health-seeking behaviour. 'Do not have the money' (43%) and 'Not serious enough' (41%) were the commonest reasons for not visiting a clinic, reported more frequently by lower and higher socio-economic classes, respectively, for both urinary or intestinal schistosomiasis. The regular health service shows some potential in passive control of schistosomiasis as some, but far too few, people visit a health facility as first or second option.

**keywords** schistosomiasis, health-seeking behaviour, health services, integration, Ghana

## Introduction

Schistosomiasis affects mostly children, farmers and women who depend on daily water contact for domestic and occupational activities. The disease is especially important in poor, rural areas, where attempts to alleviate poverty also promote small-to-large scale water-related development projects that may increase transmission. The effects of the disease are varied. Urinary schistosomiasis (caused by *Schistosoma haematobium*) leads to blood in urine (haematuria) and painful urination (dysuria) as early symptoms whilst secondary bacterial infection, calcification of the bladder wall, bladder stones, bladder carcinoma, hydronephrosis and kidney failure are late stage complications. Intestinal schistosomiasis (caused by

*S. mansoni*) gives rise to blood in stool or (bloody) diarrhoea and abdominal pain. Also, inflammatory reactions in the liver lead to hepato-splenomegaly. Later-stage lesions become fibrotic and progressively occlude the portal system, leading to portal hypertension that may precipitate haematemesis from ruptured oesophageal varices. Female and male genital schistosomiasis reduces fertility and may promote the spread of HIV/AIDS (Leutscher *et al.* 2000; Poggensee & Feldmeier 2001). Furthermore, the overall vitality and academic performance of children is affected (Nokes *et al.* 1999).

Until recently, control of schistosomiasis was largely based on vertical programmes (Gryseels *et al.* 1991; el Malatawy *et al.* 1992; Barakat *et al.* 1995), with separate budgeting from regular health services supported by donor

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organizations. The 'vertical' concept aims at reducing prevalence of the infection, and thereby morbidity, through active case finding. Within this approach, treatment of infected individuals or target groups with the standard dose of 40 mg praziquantel/kg body weight is applied in many endemic countries (WHO 1985). Although reinfection occurs, particularly in children, pathology is resolved or at least its development is delayed (Mohamed-Ali *et al.* 1991; Doehring-Schwerdtfeger *et al.* 1992; WHO 1993; Wagatsuma *et al.* 1999). Through the vertical approach, treatment is targeted at school children in many endemic areas (Engels *et al.* 1994; The Partnership for Child Development 1999). Nevertheless, the vertical approach has not been sustainable because of high cost and rapid reinfection (Kumar & Gryseels 1994). The inability to sustain schistosomiasis control has prompted many endemic countries to consider integration of control activities within the regular health services, 'the horizontal approach', as a more viable alternative (Tanner & Degremon 1986; WHO 1993). This approach aims at providing treatment to those that self-report to health facilities with schistosomiasis-related signs and symptoms. The assumption here is that, if signs and symptoms are recognized early enough by the patients themselves, most severe forms of pathology that develop later can be prevented.

In Ghana, schistosomiasis assumed major importance as a public health problem in the early 1960s following construction of the Akosombo dam (Paperna 1970). The resulting lake Volta, 8730 km<sup>2</sup>, created a vast area suitable for the breeding of schistosome host snails. Before the construction of the dam, prevalence of *S. haematobium* was 5–10%; it rose to >90% in most communities along Volta lake, raising serious public concern (Lavoipierre 1973; Scott *et al.* 1982). In spite of international control efforts for over three decades, urinary schistosomiasis remains widespread (Scott *et al.* 1982; Aryeetey *et al.* 2000). The situation was worsened by rapid increase in the prevalence of intestinal schistosomiasis at the lower Volta (Odei 1983; Wen & Chu 1984). *Schistosoma mansoni*, until recently a rare species in Ghana (Rambajan 1994), now is common in the northern parts of the country (Amankwa *et al.* 1994). Intensive control efforts have been made (Chu 1978; Aryeetey *et al.* 2000) including mass chemotherapy in primary schools initiated in the early 1990s under The Partnership for Child Development (1999) Programme. However, as in most endemic countries with economic constraints, sustainability of large-scale vertical control programmes has not been achieved.

Currently, Ghana is restructuring its health care delivery system to strengthen the peripheral health facilities. In the decentralized health system, integrating parasitosis control into the regular health services is essential. However, being

a chronic illness with mostly mild-to-moderate debilitation, the seriousness of schistosomiasis at the community level can be underestimated (Tanner *et al.* 1986; Gazzinelli *et al.* 1998) and the tendency for individuals to self-report at health centres can be low.

Studies on health-seeking behaviour in schistosomiasis have focused mainly on knowledge, attitude and practices (KAP) in relation to the status of the infection as measured by prevalence or morbidity (Kloos 1995; Gazzinelli *et al.* 1998; Aryeetey *et al.* 1999; Curtale *et al.* 1999). There is hardly any study that has evaluated the determinants of passive case reporting to existing health care delivery systems. It is well noted that, whilst such epidemiological studies are sufficient to establish prevalence figures and distribution of knowledge and practices, they do not necessarily infer any causal associations or consequence on particular actions taken. Various factors emanating from the household, community and national levels, or even introduction of internationally driven policies such as the cost recovery system directly or indirectly influence health-seeking behaviour. Understanding peoples' health-seeking behaviour and factors influencing the decision to self-report with schistosomiasis-related signs and symptoms is, therefore, highly relevant for health planners and policy-makers towards integration of parasitic diseases control within the regular health services.

The main objective of this study was to investigate health care-seeking behaviour of patients with signs and symptoms suggestive of schistosomiasis in an endemic population in Ghana and describe the decision-making process for obtaining health care. Also, the determinants of case reporting to the existing (regular) health care delivery system, which are essential to the success of integrated control of the disease, were investigated.

## Materials and methods

### Study area and population

A questionnaire-based field study was carried out in Kokoetsekope, a village of 380 inhabitants located in the Greater Accra Region of Ghana. It is one of the clusters of villages situated along the Densu lake formed as a result of damming the Densu river. The lake is the main source of water supply to Accra and the surrounding towns. The village is endemic for both urinary and intestinal schistosomiasis. In a preliminary pilot survey by the Noguchi Memorial Institute for Medical Research (NMIMR) in the same population, prevalence rates of *S. haematobium* and *S. mansoni* were found to be 70% and 78%, respectively. The general vegetation is the coastal savannah type with short grass and scattered bushes. Along the shores of the

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lake are aquatic plants, which harbour the schistosome host snails (*Bulinus truncatus rohlfsi* and *Biomphalaria pfeifferi*), making the lake the main source of infection. The inhabitants fetch untreated water from the Densu lake for drinking, bathing and domestic activities, whilst others, particularly children, swim in it.

Kokoetsekope is inhabited mostly by migrant workers and their families from fishing communities in the Volta Region of Ghana. It is a young population: 44% are children under 15 and 3% adults over 60. There was no difference in number between males and females. The general educational status of individuals aged 15 years and above was low; 24% never attended school and 60% had only elementary education, mostly incomplete. Adult women >15 years of age engaged in petty trading, while most men worked as fishermen, farmers or labourers. Multiple occupations were common among both genders.

The health facilities used by the people are located in Kasoa, a nearby commercial town about 2 km away. There were a total of 13 health care facilities where the inhabitants of Kokoetsekope reported to have visited for medical care. Two were health centres and 11 private clinics. Also, there was a chemical shop in Kokoetsekope from which individuals obtained drugs. Both health centres were level B type of the primary health care system, and mostly without laboratory facilities. Of the 11 clinics, four provided both maternity and clinical care and were headed by midwives, two combined clinical and herbal treatment and the remaining five were regular clinics headed by qualified medical doctors or nurses. The health centres were government owned and manned by medical assistants. In these health care facilities treatment for schistosomiasis was usually based on signs and symptoms. The system of payment for health care delivery was *cash and carry* (out of pocket payment) where a patient was required to make full payment for consultation and laboratory investigations before treatment was provided. Within the cash and carry system, mostly essential drugs are kept in the health facilities. Thus, patients attending these health facilities obtained drugs prescribed to them from private pharmacies.

### Data collection

The interviews took place between July and September 2000. Opinion leaders and community members were first informed about the study in a *durbar* and their consent sought. Subjects were assured about confidentiality of information obtained from them. Thereafter, a detailed plan of the study and its objectives were submitted to the Ethical Committee of Ghana Ministry of Health for approval, which was granted in August 1999. The study

village was divided into six sectors based on topographical landmarks and proximity to the lake. House numbers were assigned to all the houses and each inhabitant was registered according to household. Each subject was assigned an identification code defining the village, location of house and serial number.

A pretested questionnaire developed in English was translated into the local language (Twi) and administered to all the inhabitants. The questionnaire was made up of a demographic section including name, age, sex and house number of subjects; decision-making indicators such as who requests health care, who provides money for health care; socio-economic indicators such as level of education, occupation and property owned; indicators of schistosomiasis-related signs and symptoms such as duration and severity; and action taken. The signs and symptoms covered by the questionnaire were: blood in urine and painful urination (for urinary schistosomiasis); blood in stool/bloody diarrhoea, abdominal pain and swollen abdomen (for intestinal schistosomiasis); and fatigue (non-specific) an indication of anaemia, which could be the result of urinary and/or intestinal schistosomiasis. It should be noted that the signs and symptoms covered here are only suggestive of, but not necessarily, because of schistosomiasis. Fever (for malaria) was added as a disease of high debility for comparison. Questions about signs and symptoms were asked in a random order. Reported action taken could include multiple activities (e.g. first self-medication and then visiting a clinic). Individuals with reported signs or symptoms who did not visit a health facility (clinic or health centre) were asked to give a reason. Respondents were asked about causes of blood in urine and bloody diarrhoea.

All registered individuals were interviewed. Parents or guardians answered for small children under 6 years. Potential respondents for individuals who could not answer for themselves were preferentially ranked as follows: mother, father, guardian (aunt, uncle or other close relatives). To minimize variability, the questionnaire, which took an average of 20 min, was administered by two trained interviewers. The socio-economic status of individuals was assigned by using the status of the household to which they belong. Three possessions (car, fridge and television) were selected as indicators of relatively high socio-economic status of a household. Any household owning one or more of these was considered as being in the relatively high category.

Also, we interviewed five health care facilities and four chemical shops serving Kokoetsekope about availability of praziquantel as well as prescription and treatment practices for a selection of schistosomiasis-related symptoms (blood in urine, painful urination, blood in stool and diarrhoea)

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with a modified version of a questionnaire that was used in other parts of Ghana (Van der Werf *et al.* 2003). Patients who visited a health facility or chemist were asked about their knowledge about what was provided or prescribed to them in three focused group discussions. Those who used traditional self-medication were asked about the kind of medicines taken.

## Results

Table 1 summarizes data on decision-making process for seeking health care. The majority of adults responded to the interview themselves. Mothers and fathers were the key decision-makers about health care for dependent children. Other family members who made decisions for younger children were guardian (uncle and aunt), sisters and brothers. Mothers usually requested health care for children under 10 and accompanied them to the health care

**Table 1** Factors influencing decision to seek health care with schistosomiasis-related signs and symptoms among inhabitants of Kokoetsekope in Ghana

Variable	Respondent (%)	Request for care (%)	Financial provider (%)	Companion* (%)
Age 0–4 years ( <i>n</i> = 51)				
Self	0.0	0.0	0.0	0.0
Mother	78.4	86.3	31.4	86.3
Father	5.9	9.8	56.9	9.8
Other	15.7	3.9	11.8	4.0
Age 5–9 years ( <i>n</i> = 47)				
Self	31.9	10.6	0.0	0.0
Mother	34.0	51.1	36.2	63.8
Father	14.9	34.0	59.6	31.9
Other	19.2	4.3	4.3	4.3
Age 10–14 years ( <i>n</i> = 40)				
Self	82.5	32.5	0.0	2.5
Mother	5.0	35.0	37.5	55.0
Father	5.0	22.5	47.5	22.5
Other	7.5	10.0	15.0	20.0
Age 15–19 years ( <i>n</i> = 30)				
Self	96.7	70.0	13.3	30.0
Mother	0.0	10.0	26.7	40.0
Father	3.3	16.7	46.7	23.3
Other	0.0	3.3	13.4	6.7
Age 20+ years ( <i>n</i> = 149)				
Self	98.7	97.3	59.7	84.6
Mother	0.0	0.0	2.0	1.3
Father	0.0	2.7	7.4	2.0
Other	1.3	0.0	30.9	12.1†

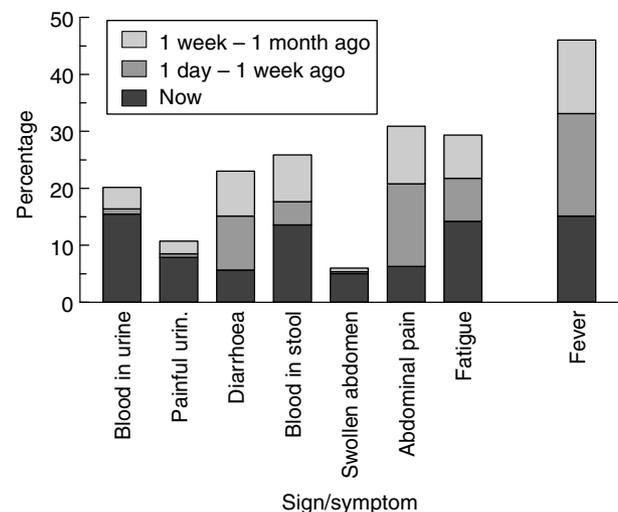
\* Companion to clinic or health centre; in case of self, the individual was not accompanied.

† In most cases, the husband/wife.

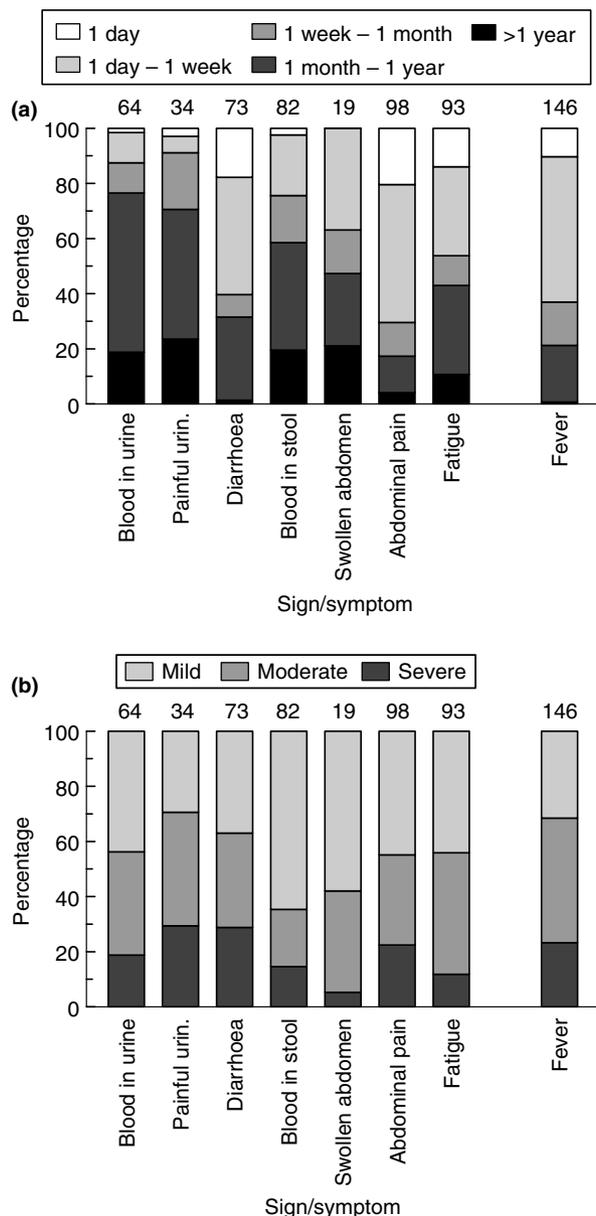
Other = guardian, uncle, aunt, brother and sister.

facility, while fathers often provided financial support. The roles of mothers declined with increasing age of the child, whilst that of fathers increased. Some teenagers started paying for their health care as early as at age 14, particularly those not attending school. Most adults over 20 reported paying for health care services themselves, although some, mostly students and a few married women, were funded by parents and husbands. A few of the married couples accompanied either partner to a clinic/health centre. About 68% of those who had visited health facilities indicated that they usually spent half a day to obtain health care (data not shown).

Using a 1-month recall period (Figure 1), there were 64 reported cases of blood in urine (20%), 34 (11%) of painful urination, 73 (23%) of diarrhoea, 82 (26%) of blood in stool, 19 (6%) of swollen abdomen, 98 (31%) of abdominal pain, 93 (29%) of fatigue and 146 (46%) of fever. For diarrhoea, abdominal pain and fever, the number of cases tripled by including reported episodes that terminated in the month before interview. Figure 2a confirms that these symptoms showed acute patterns and rarely persisted beyond 1 month. On the contrary, more than 75% of subjects with blood in urine and those with painful urination reported persistent signs and symptoms for 1 year or longer. Similarly, blood in stool (60%) and swollen abdomen (50%) showed characteristic chronicity. Swollen abdomen and diarrhoea were typically associated with children under 10, whereas blood in urine and painful urination were reported by 38% of teenage boys and 2.8%



**Figure 1** Reported presence of schistosomiasis-related signs and symptoms grouped into three recall periods among 317 interviewed inhabitants of Kokoetsekope (Ghana). Fever (for malaria) has been selected as a disease of high debility for comparison.



**Figure 2** Reported duration with which individuals in Kokoetsekope have lived with their signs and symptoms (a) and their opinions about severity of schistosomiasis-related signs and symptoms (b). A debilitating sign, fever, (for malaria) has been selected for comparison.

of girls (data not shown). There were no gender differences for fever, abdominal pain and blood in stool. Fatigue was reported mainly by adults, particularly women. As shown in Figure 2b, 60–70% of subjects with painful urination, diarrhoea and fever considered these signs and symptoms

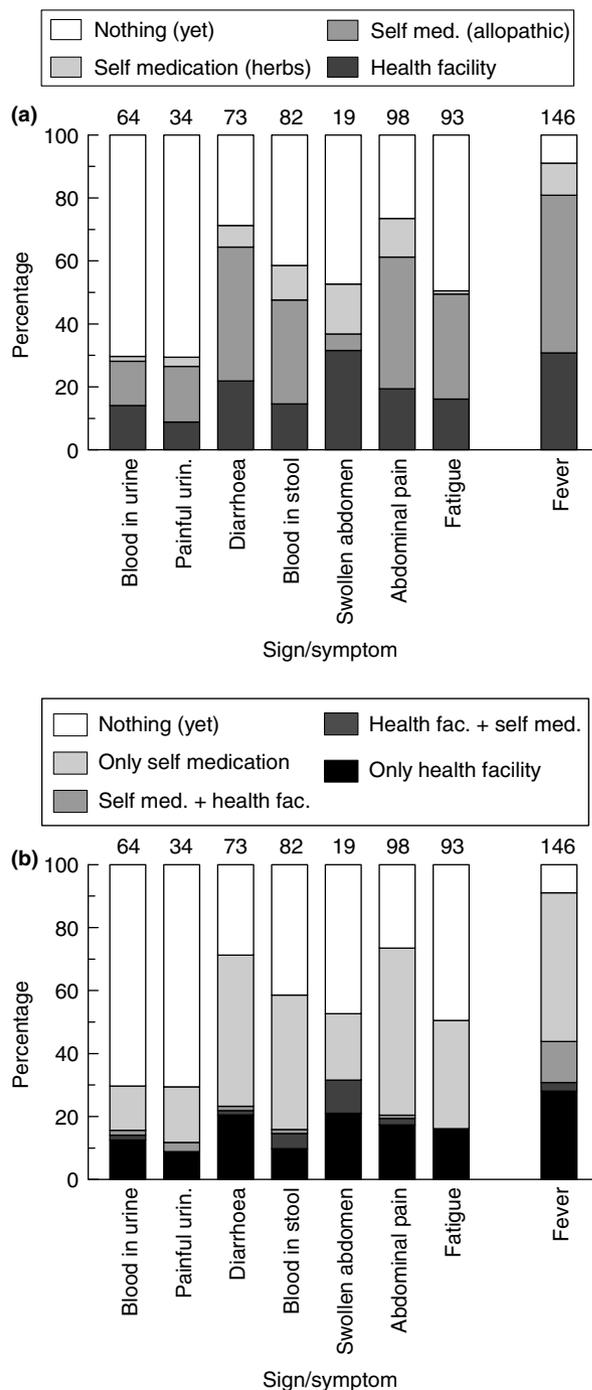
as severe or moderate, whereas this was only 30–40% for blood in stool and swollen abdomen (Figure 2b).

People reacted to signs and symptoms by doing nothing, self-medicating or visiting a health facility (Figure 3a). Most subjects with blood in urine and painful urination did not take any action, whereas >90% of those with fever did. Diarrhoea, blood in stool and abdominal pain usually led to action, mostly self-medication. Allopathic medication was used four to five times more often than herbal medicine. On average, 20% of schistosomiasis-related signs and symptoms were said to have been reported to health facilities as first option with some of those that self-medicated eventually visiting a clinic or health centre as a second or third alternative (Figure 3b). The results showed that some of those, especially with blood in stool, swollen abdomen and fever who visited a health facility as first option, still self-medicated afterwards. This practice was rare for diarrhoea, blood in urine and abdominal pain. Also, self-medication as first option followed up by visiting a health facility was regularly practised for fever (Figure 3b).

Children under 10 years of age and females were much more likely to visit health facilities as first option than teenagers (Table 2). For actions other than visiting a clinic/health centre, no clear differences were observed except for male teenagers, who also showed a relatively low tendency here (Table 2). Similar analyses revealed that perceived severity of schistosomiasis-related signs and symptoms rarely increased health care seeking, and duration of signs and symptoms and socio-economic status of individuals did neither (data not shown).

Several reasons were given for not reporting to a clinic or health centre with signs and symptoms (Table 3). Of 460 responses given, 'Do not have the money' (43%) and 'Not serious enough' (41%) were most often mentioned. 'Do not have the money' was reported by 53% of individuals from the low socio-economic group, whereas this was 33% for the high social class. On the contrary, 'Not serious enough' was reported by 38% of the low and 54% of the high classes, respectively. All reported reasons were grouped into four categories: 'No money' (46.5%), 'Not serious enough' (44.2%), 'Negative attitude towards health care' (4.5%) and 'Positive attitude towards self-medication' (4.8%). Answers in response to the different signs and symptoms did not show any clear pattern (Figure 4).

Regarding the population's knowledge about symptoms, about half (43%) of those who responded to the interview themselves reported that the lake was the cause of blood in urine, but only 7% specifically related blood in urine to schistosomiasis (or bilharzia). Only 7% associated bloody diarrhoea with the lake and nobody mentioned schistosomiasis (or bilharzia).

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**Figure 3** Reported action taken about schistosomiasis-related signs and symptoms (a) first action only and (b) first and second actions (first action followed by second). The values on top of the bars represent the total number of eligible cases based on 1 month recall period. 'Health facility' indicates visiting a clinic or health centre.

**Table 2** Reported actions taken in response to schistosomiasis-related signs and symptoms

	Child (0–9 years)		Teenager (10–19 years)		Adult (20+ years)		All
	Female	Male	Female	Male	Female	Male	
Number of cases*							
Urinary	10	15	10	34	6	23	98
Intestinal	36	46	24	35	46	66	253
Fever	23	22	18	19	35	29	146
Visiting a health facility as first action (% of number of cases)							
Urinary	20	13	10	6	33	17	13
Intestinal	36	17	17	6	13	21	19
Fever	48	27	28	37	26	24	31
Other action (% of number of cases)							
Urinary	20	27	10	6	0	30	16
Intestinal	44	46	50	31	65	53	49
Fever	52	64	56	47	63	72	60

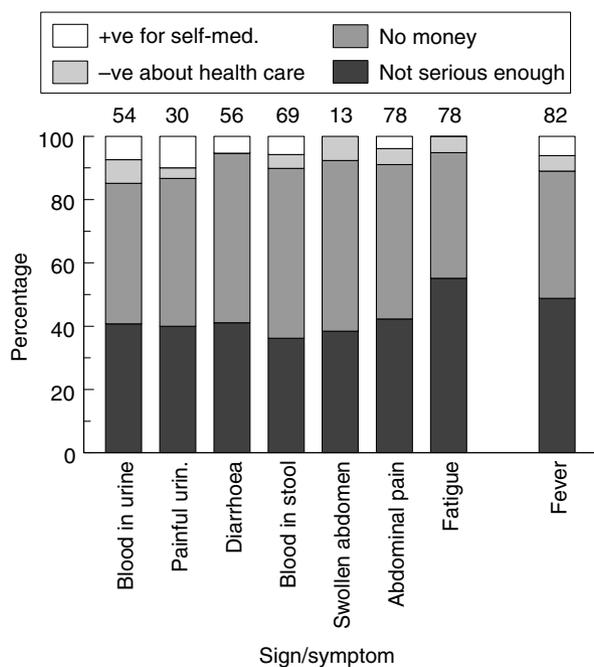
\* Urinary signs and symptoms included blood in urine and painful urination. Intestinal signs and symptoms included diarrhoea, blood in stool and abdominal pain. Fever (for malaria) was included for comparison. Some individuals reported multiple signs and symptoms, thus were represented more than once.

**Table 3** Reported reasons ( $n = 460$ ) for not attending a health facility (clinic or health centre) with schistosomiasis-related signs and symptoms

Reason	Number of responses	%
Financial difficulties		
Do not have the money	200	43.5
Too expensive	14	3.0
Seriousness of symptoms		
Not serious enough	187	40.6
Too busy	9	2.0
Waiting for some time	4	0.9
Too far away*	3	0.7
Negative attitude towards health care		
Drugs do not help	20	4.3
No drugs	1	0.2
Positive attitude towards self-medication		
Self-medication effective	10	2.2
Waiting for drug peddler	6	1.3
Waiting for effect of self-medication	4	0.9
Used previous drugs	1	0.2
Used old prescription to buy drugs	1	0.2

\* The distance to the furthest target health facility is 2 km.

Only one health facility and none of the chemical shops stocked praziquantel. However, chloroquine (for treating malaria) was available in all health facilities and chemical shops. Over 90% of patients did not know what was

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**Figure 4** Reported reasons for not going to a health facility (clinic or health centre) for four categories of answers given. The values on top of the bars represent the number of cases (1 month recall) that did not visit a health facility with their sign or symptom.

prescribed or provided to them at the health facilities and chemical shops except for oral rehydration salt (ORS) and chloroquine. Knowledge, prescription and treatment practices of health care providers were associated with the level of training received. Cases of blood in urine were most likely to receive a prescription of praziquantel (four of the five health care facilities interviewed) compared with blood in stool and painful urination (both one of five) and diarrhoea (none). Cases of diarrhoea would usually receive ORS and antibiotics. The majority of those who self-medicated or visited chemical shops for treatment were given flagyl (Metronidazole) and antibiotics. One of four chemical shops would have provided praziquantel for blood in urine, if it were available. Still, many did not have any idea about the kind of drugs provided or prescribed to them. No known traditional medicine was used for treating schistosomiasis-related symptoms except for blood in stool where some subjects used ginger plus pepper.

## Discussion

Many studies have investigated the effect of KAP on seeking health care for infectious diseases (Ruebush *et al.* 1995; Sodemann *et al.* 1997; Soucat *et al.* 1997; Jaramillo

1998; Ahmed *et al.* 2000; Geissler *et al.* 2000; Oberlander & Elverdan 2000; Thorson *et al.* 2000; Needham *et al.* 2001). Nevertheless, the impact of knowledge and attitudes on regular health care use has not been widely studied. KAP studies on schistosomiasis (Kloos 1995; Gazzinelli *et al.* 1998; Aryeetey *et al.* 1999; Curtale *et al.* 1999) established prevalence figures and distribution of knowledge and practices, but did not show consequences on particular actions taken. Our aim was to determine these factors and their influence on the use of health facilities in a schistosomiasis endemic community.

Keller *et al.* (1997) compared 1-week recall for measurement of acute properties with the standard (1-month recall) and found that 1-week recall yielded high-quality data. Also, Schulpen and Swinkels (1980) showed that 60% of subjects in Kenya under-reported self-medication of common illnesses using a recall period of 2 weeks. Given the recall of one month for this study, we anticipated under-reporting by subjects with mild schistosomiasis-related signs and symptoms. Strikingly, subjects who had never experienced symptoms, those who had, and those with ongoing symptoms did not show differences in the reported tendency to visit health facilities or other health-seeking practices. This justified the inclusion of cases up to 1 month in our analysis. In a study of non-fatal injuries in Ghana, Mock *et al.* (1999) reported that 1 month recall was appropriate. The findings of this work therefore suggest that in schistosomiasis morbidity studies 1 month recall period is suitable, although there is a need for further studies to ascertain the applicability of this time frame for both the urinary and intestinal diseases.

Except for haematuria, many of the signs/symptoms are neither specific nor sensitive for the diagnosis of schistosomiasis. Although no parasitological examination was performed to link symptoms with specific disease, the number of individuals reporting symptoms that have schistosome infection was undoubtedly high as we found 78% infected with *S. mansoni* and 70% with *S. haematobium* in a random sample of the population. Still, it is not certain that a symptom suggestive of schistosomiasis was the result of schistosome infection. In particular, diarrhoea and abdominal pain could very well have resulted from causes other than *S. mansoni* infection. If so, our findings for such cases may still be informative, as it is not very likely that health-seeking behaviour depends much on the cause of a particular symptom. For those who did take action for blood in urine or blood in stool, it is certain that fear of schistosomiasis was not the reason, as hardly anybody linked these symptoms to schistosomiasis. This is in contrast to fever, a term loosely used to refer to clinical malaria in Ghana (Agyepong 1992; Asenso-Okyere & Dzator 1997), which is usually perceived as a threat.

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However, e.g. for some adults with blood in stool, it may be possible that fear of much more serious disease such as colon cancer was the reason for seeking health care. It is hoped that in future studies the reasons for taking a particular health care action would be explored in addition to reasons for not visiting a hospital or clinic.

In an era of financial stringency, a more realistic formulation of health policies and programmes requires a better understanding of the determinants of health care-seeking behaviour. Several studies about the effect of cost recovery policies introduced in the early 1990s in Ghana and elsewhere showed that the *cash and carry* system, which was intended to recover cost, led to a drop in attendance of hospitals, health centres and clinics (Bir-itwum 1994; Wyss *et al.* 1996) and a concomitant increase in self-medication and other cost savings (Asenso-Okyere *et al.* 1998). It was therefore not surprising that for most subjects in the lower socio-economic class at Kok-oetseko, the reason for not visiting a clinic/health centre was, 'Do not have the money'. The rate of health care seeking did not differ between the two socio-economic groups though. The observation in this study that fathers were the main financial providers for health care suggests that mothers' perception and their roles may not necessarily lead to health care for the child if the father's perception is poor. Obviously, the role of the financial provider, mainly fathers, for health care is crucial and must be considered seriously in health education programmes.

The finding that some teenagers, particularly those not in school and mostly boys, started financing their health care at a very early age (14 years) may in part explain their unusually low tendency to visit clinics or health centres. Child labourers may not earn enough to finance their health care. Weighed against other diseases of high debility, money may not be spent to seek health care for a mild recurring disease. The implications are serious although, as severe pathology is usually a consequence of long-term infection. This suggests that teenagers who usually have high intensity (and high frequency of signs and symptoms) may also suffer from more severe pathology for not receiving treatment. Teenagers therefore remain a major challenge to the success of health care integrated schistosomiasis control.

Self-medication is a worldwide phenomenon (Abosede 1984; Kloos *et al.* 1987; Haider & Thaver 1995) and was practised by a high percentage of our subjects. This observation could in part be explained by factors such as patient's ability to pay and availability of diagnostics/therapeutics in health facilities. Lack of praziquantel in most peripheral health facilities in endemic areas of Ghana was reported in a recent survey (Van der Werf *et al.* 2003). Nonetheless, in the current study unavailability of drugs in

the health care facilities was rarely mentioned as a reason for not attending a health facility. Other factors such as the quality of service delivery and overall time spent to seek care are probable causes. The average distance to health facilities was short and may not negatively affect attendance. Nevertheless, the high self-medication rate is an indication of health awareness that could be explored towards the integrated approach to schistosomiasis control.

The observation that schistosomiasis-related signs and symptoms were either reported to health facilities as first option followed by self-medication or visiting a clinic/health centre after self-medication has serious implications. First of all, self-medication after regular health care suggests that patients did not receive adequate treatment. Nevertheless, engaging in self-medication before visiting a clinic or health centre also suggested that regular health care remained a final option. The potential role that the health system can play in health care delivery was revealed by the preference of allopathic self-medication to herbal or traditional treatment. However, the failure of many subjects with blood in urine and painful urination to take action is a challenge for schistosomiasis control by passive case detection.

The overall low rate of visiting health care facilities by patients may not seem very encouraging for integrated control. However, a hospital visit is expected to be selective towards those with heavy infections; on average 20% that visited a health care facility with early symptoms may represent most of those at risk of developing severe consequences of schistosome infection later (e.g. kidney problems, portal hypertension or vomiting blood). A study in rural Cameroon showed selective hospital visit for haematuria by high intensity cases that formed only 13% of the overall infection in the population (Slootweg *et al.* 1995). Ideally, an overall judgement of the prospects of integrated control by passive case finding requires prospective cohort studies of considerable length of time incorporating complex issues such as the natural history of development of pathology and morbidity, the intermittent nature of some of the signs/symptoms and insensitive parasitological diagnosis. As such follow-up studies are impossible to conduct for ethical reasons, the use of simulation models is probably the only way to adequately study these complex issues. The potential to receive adequate treatment perhaps is not as bad as reflected by the low rate of visiting hospitals or clinics, as some of those who engaged in orthodox self-medication may have received praziquantel elsewhere. Furthermore, the high preference for orthodox self-medication is a key potential to explore to increase the utilization of the regular health system. Health education, for example, could trigger those who apparently find their symptoms important enough to

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take action to go to a health care facility. Also, health education may raise awareness of many individuals with, e.g., blood in urine or blood in stools that did not take any action. Obviously, there is a need to make praziquantel available and accessible to endemic communities at the same time with health education.

Our study has shown that over 90% of those that self-medicated or visited chemical shops for treatment did not receive praziquantel. At the same time, there was no known traditional medicine for treating schistosomiasis-related symptoms. This raises serious public health concern as self-medication seems less likely to help in morbidity control of schistosomiasis. Also, given that knowledge about the cause of schistosomiasis-related symptoms was poor and majority of patients that visited health facility or chemical shop did not have any idea about the kind of prescription or treatment provided, calls for additional efforts such as health education to address this problem. It should be clear that successful integration of schistosomiasis control activities within the existing health care delivery system should target patients and health care providers alike. Particularly, the knowledge of health care providers at the peripheral levels is crucial to the success of the integrated concept because of the changing pattern of schistosomiasis in Ghana. In the preliminary survey to select a suitable field site for this study, it was noted that case-specific records in most health facilities in the country rarely differentiated between urinary and intestinal schistosomiasis. Most reported cases of schistosomiasis were simply registered as 'bilharzia'. This may be so because of perceived predominance of urinary schistosomiasis based on earlier distribution (Rambajan 1994). The pattern is changing as an intense focus of transmission was reported in northern Ghana (Amankwa *et al.* 1994), and the prevalence of intestinal schistosomiasis by microscopy in the present study area was 78%. In Egypt, a similar observation was made when health care personnel continued to focus on *S. haematobium* at a time when *S. mansoni* had become the predominant species (el Katsha & Watts 1995). Consequently, health personnel and persons at risk must be sensitive to the tremendous variations that exist in the clinical presentation of schistosomal infection. Equipment for parasitological diagnosis and supply of praziquantel are essential.

The low rate of reported health care facility visiting for schistosomiasis-related signs and symptoms could be attributed to several factors including the perceived seriousness of the disease, availability of money, seasonal effects, drug peddlers who visit endemic communities and drug sales at chemical shops. Furthermore, the quality of service, availability of diagnostics and therapeutics, and perceived effectiveness of treatment may influence the

decision to visit a clinic or health centre. Hewlett and Cline (1997), for example, identified severity of signs and symptoms as an important determinant of health care visiting for urinary schistosomiasis in Cameroon. There is the need for further studies to elucidate these determinants in the study area.

This study has identified a number of factors that should be emphasized in attempts towards schistosomiasis integrated control. However, in view of the extreme sensitivity to inaccurate recall in health-seeking behaviour studies based on self-perceived morbidity reporting, more detailed studies incorporating case-specific records are in progress to further elucidate and validate the identified factors.

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