

## Myths and Beliefs about the Acquisition of Taeniasis and Cysticercosis amongst the Xhosa University Students in South Africa

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**KEYWORDS** Myths. Belief. Tapeworm. Cysticercosis. Taeniasis. Xhosa

**ABSTRACT** The main inhabitants of the Eastern Cape Province in South Africa are the Xhosa people. Myths and beliefs are part of every culture. This paper focuses on the myths about the acquisition of Cysticercosis and Taeniasis amongst the Xhosa university students in the field of health promotion. The research was a cross-sectional survey. A convenience sample was used. The sample was a group of students in one class, an intact group. Data were collected through a questionnaire from the first year Health Promotion Education (HPE) class in the Faculty of Health Sciences at a public university in South Africa. This university is geographically located in the tribal land of the Xhosa people. Although the population consisted of 70 first year HPE students, only 66 students voluntarily took part in the study: 19 males and 47 females. The data were manually analysed and percentages were computed. The results indicated that there were several myths and beliefs about the acquisition of Cysticercosis and Taeniasis amongst the Xhosa people. These myths were highly entrenched in the belief system and the students brought these myths and beliefs to the university. Such myths and beliefs were found to hinder the acquisition of scientific knowledge about the ways in which Cysticercosis and Taeniasis are contracted. Inclusion of scientifically correct ideas in school curricula and training health educators with scientifically correct conceptions and their active role in eradicating myths in villages ought to be considered as a matter of priority.

### INTRODUCTION

The Eastern Cape Province is one of South Africa's poorest provinces. The province is in the south-east part of the Republic of South Africa and is made up mainly of the geographical areas of the two former apartheid-regime creations of homelands: the so-called independent former Republics of Transkei and Ciskei. The main inhabitants in this area are the Xhosa people. The word Xhosa is used for the population group as well as for the language they speak. However, the language is more correctly known as isiXhosa which is one of the Bantu languages and one of the official languages of South Africa. This paper emanates from one part of a larger study and focused on the myths on acquiring Cysticercosis and Taeniasis.

### MYTHS AND BELIEFS

Myths and beliefs are part of every culture. Myths are part of mythology, legends, folklore

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and tradition. Beliefs influence individual attitudes, viewpoints, ideas, thinking, ways of life and values. Several studies have reported on such myths and beliefs, for example, Ogundele (2007) (spiritualism of the Yoruba in Nigeria), Das et al. (2008) (malevolent supernatural causing diseases by Sonowal Kacharis in Assam in India), Bhasin (2008a) (spirit possession causing illness by Gaddis in the Himachal Pradesh in India), Bhasin 2008b (spirit worship and ritual care among the Brokpas of Ladakh, India), Dhargupta et al. (2009) (superstitious beliefs of the Sabars in West Bengal in India), Shoko and Burck (2010) (the concept of evil in Shona traditional religion in Zimbabwe). Traditional beliefs and cultural heritage play a prominent role in propagating myths and beliefs and traditional healers are inseparable links in such propagation.

This study being on myths about tapeworms and the diseases caused by them, some myths about tapeworms are appropriate here. Myths about tapeworms and how to get rid of them are not new. Tambongco (2004) reported three myths on riddance of tapeworms, two through the anus and one through the mouth. She attributed such myths to the lack of knowledge about tapeworms as follows: (a) two ways of riddance through the anus: (i) insert a piece of meat into the anus everyday for a week and on the

eighth day, the worm should come out of the anus looking for food and can then be pulled out; (ii) sit on a bucket of water and wait until the tapeworms exited the anus; (b) riddance through the mouth: fast for three days, hold a bowl of food to the mouth after fasting and the worm would then crawl out in search of food. She also reported about the tale of the tapeworm as the basis of the miracle weight loss diet practiced by young, aspiring actresses and models in Hollywood purposely infecting themselves with tapeworms in order to lose weight.

Myths and their role in serious repercussions on various aspects of life style have been documented (Watson and Kopniecek 1990; Tekkaya 2003). The only set of studies to-date focusing on myths on tapeworms in the geographical area of the present study that could be located were by Foyaca-Sibat et al. (2004), Foyaca-Sibat et al. (2005), Del Rio et al. (2005), Del Rio et al. (2007) and Foyaca-Sibat and Del Rio-Romero (2008). The results of the research which they carried out in the Sidwadweni, Ngqwala, Makaula and Nkalukeni villages of the rural Eastern Cape revealed the villagers' ignorance about the transmission and causes of neurocysticercosis and superstitions about epilepsy. In addition, they also stressed the role played by the traditional healers in promoting existing myths or adding to them.

Studies have shown that the socio-economic parameters affect health issues in tribal areas and villages (Del Rio et al. 2007; Dhargupta et al. 2009). The statistics portrayed by Del Rio et al. (2007) from a case study give a general idea of some characteristics in a village in Transkei in South Africa: 22% of illiteracy, 75% of unemployment, 7.9% of prevalence of epilepsy, 76% of persons without knowledge about epilepsy, 48% without understanding about HIV/AIDS, 29% without knowledge about the mode of transmission and preventive measures (HIV/AIDS). Since villages across the Eastern Cape transform too slowly, there might not be much change in 2011. They state,

*Socio-economic status in general was characterized by unemployment or very low salaries, limited access to primary health care and health education, limited access to toilet facilities, proper refuse disposal, safe and clean water, lack of widespread education of the most peoples to limit access of pigs to human faeces while free-range pig farming is commonly prac-*

*ticed. Most of the population (87%) did not know about Neurocysticercosis (NCC). Pork meat consumption is high at least once a month and the preferred method for cooking was boiling (Del Rio et al. 2007).*

### **Traditional Beliefs, Traditional Healers, Traditional Medicines, Supernatural and Spiritualism**

Generally, traditional beliefs, traditional healers and traditional medicines play a very prominent role in supporting and maintaining health in the rural villages (Bhasin 2008a,b; Amazat and Abdullahi 2008; Sidhu and Pannu 2010). Alternative terminologies seen in the context of traditional healers and traditional medicines in the literature amongst others include indigenous healers and indigenous medicines (Bhasin 2008a; Sidhu and Pannu 2010), native healers and native medicine (Amazat and Abdullahi 2008), and traditional medicine and Sangomas (Pretorius 1999; Del Rio et al. 2007).

Bhasin (2007a) classifies traditional healers into four groups: (i) Specialists in Home Remedies; (ii) Herbal Specialists; (iii) Ritual Specialists and Spiritual Healers; (iv) Magico-religious Healers. The power and usefulness of traditional or indigenous knowledge cannot be underestimated. For example, Sidhu and Pannu (2010) report that a World Bank Report in 1998 acknowledged that 20% of available modern medicines as contributions from the indigenous knowledge world and cites the Paul and Ramanathan (2002) report that nearly 75% of the 121 plant-derived prescription drugs used worldwide were discovered following leads from indigenous medicine.

The World Health Organisation, WHO (WHO 2002: 17) views traditional medicine as, *... including diverse health practices, approaches, knowledge and beliefs incorporating plant, animal, and/or mineral based medicines, spiritual therapies, manual techniques and exercises applied singularly or in combination to maintain well-being, as well as to treat, diagnose or prevent illness.*

As such, anyone practicing or providing health care which involves any or a combination of the contents of the description under the above view is a traditional/native healer or Sangoma. Tribal belief systems acknowledge both the healing through the use of matter

(herbs, animal or mixture of animal- and plant-based matter) and the pleasing of the spirits including those of the ancestors. Bhasin (2007a) and Sahu et al. (2010) refer to a WHO report which states that about 80% of the world's population depends on traditional medicine for their primary health care. Plants are not the only source of traditional medicine. While Negi and Palyal (2007) report the use of animal and animal products (mammals, birds, reptiles, insects, fish and amphibian) by the Shoka tribe of Uttaranjal in India, Prabhakar and Roy (2009) report the use of shell fish for medicinal purposes in Bihar in India. Referring to the Gaddis in the Himachal Pradesh, (Bhasin 2008a) terms the former as the health of the body and the latter as that of the mind. Rout, Panda and Mishra (2009) attribute the dependence on traditional medicine and medicinal plants to poor availability of modern health care and poverty, mainly in rural areas.

According to Bhasin (2008a: 1), traditional medicines are "part of the cultural heritage of each population". Rout et al. (2009: 27) view the use of medicinal plants for cure as a "cultural tradition" amongst the tribals of Mayurbhanj in Orissa in India. While reporting on the health status of tribals in Rajasthan in India, Bhasin (2007b) echoes this view when she states,

*... cultural processes play explicit part in sickness and health ... the indigenous medical system has sustained in society's social cultural complexes through deeply rooted processes. ... Cultural and social factors erect the barriers to the utilization of (modern) healthcare (Bhasin 2007b: 91).*

Nevertheless, researchers have expressed concern with the erosion or even death of traditional knowledge (Negi and Palyal 2007; Rajadurai et al. 2009). Rajadurai et al. (2009) are of the view that as younger members move from villages to cities and towns, the use of traditional medicines will decline and this will bring about a decline in the number of traditional healers resulting in the death of indigenous knowledge on traditional medicines.

In the South African villages too, traditional healers continue to be the main health care providers. (Pretorius 1999; Del Rio et al. 2007). According to Pretorius (1999),

*It has been estimated that between 60 and 80% of the South African population currently*

*use the traditional medical sector as their first contact for advice and/or treatment of health concerns ... Each of them has their own field of expertise. Even the techniques employed differ considerably. They have their own methods of diagnosis and their own particular medicine (Pretorius 1999: 250).*

Del Rio et al. (2007) explain that the situation had not changed much even in 2007. They elaborate the context thus:

*Most of epileptic patients are under traditional treatment taking herbal remedies with "anti-seizure effect," and some of them die due to herbal intoxication leading to acute renal failure when wrong mixtures of plants, wrong selection or preparation, and/or incorrect storage are made. Speaking Xhosa sangomas treat an important number of epileptic patients because epilepsy is thought to be related to a visitation by the devil, to witchcraft or to spirits, and those families also believe that they have been visited by their ancestors, whom arriving at night while they are sleeping; they also consider that the first place for visiting is the toilet being it another powerful reason why they do not use the toilet more often in spite of its availability. In other places epilepsy is thought as a disease where the heart gets blocked by foam, restricting circulation and resulting in seizure. One generalized belief is that Xhosa-sangomas shaking some bones and helped by their ancestors can find out the cause of the problem and treat it. Conventional medical care was not available for peoples living in most of those regions during apartheid era therefore almost all traditional medicines and cures were made from available material, such as leaves, roots, spider webs, axle grease, and water among other products. ... Traditional belief's roots on this community are considerably deep.*

Mafojane et al. (2003) cite studies by Kriel and Joubert (1996) and Kriel (1997) which reported interesting but startling and also alarming practices for either benevolent or malevolent purposes. The former (benevolent) makes use of modes of transmission where traditional healers/Sangomas add *Taenia* segments or their pulverized contents to the medicinal mixture which also contains so-called strengthening ingredients to treat severe intestinal tapeworm infections. The latter (malevolent) involves women being advised to poison and punish an unfaithful husband or lover by adding the contents of *Taenia solium* segments to beer.

### The Tapeworm

There are several studies of human parasites (Northrop-Clewes and Shaw 2000; Mafojane et al. 2003; Del Rio et al. 2007). Northrop-Clewes and Shaw (2000:193-194) define parasite as follows, “(literally *para* - beside, *sitos* - food) is any organism that derives benefit from living in or on another organism (the Health and the food-chain host) at a cost to the host” and succinctly portray the danger of parasites thus:

*The World Health Organization (WHO) categorises parasites among the six most harmful infective diseases of man and parasitic infections outrank cancer as the number one killer in the world. Parasites can be contracted by eating contaminated under-cooked beef, pork, fish or other flesh foods, walking barefoot on infected soil, by being bitten by flies or mosquitoes, eating unclean raw fruits and vegetables or drinking infected water. There is an increased danger of contracting parasites when travelling to tropical and/or non-industrialised countries and the rise in immigration of people from areas of infection also contributes to the risk (Northrop-Clewes and Shaw 2000:193).*

Tapeworms (Class Cestoda) are flatworms (Phylum Platyhelminthes). They live as parasites in the intestines of other vertebrate animals including humans. They have no mouth and no digestive system of their own. They absorb food directly through their body walls from the hosts' intestines. They reproduce sexually within the hosts' intestine and sheds proglottids (segments filled with ripe eggs). In order for the life cycle to continue, the eggs need to be ingested by an intermediate host, cow, pork or fish. The eggs hatch in the host intestine and the larvae make their way into the muscles. There they encyst (cysticercus larvae) and remain there until released by the primary host, for example, a human eating under- or uncooked beef, pork or fish. Once ingested, the cysticercus larvae evert their hooked scoleces (singular scolex-head with hooks) and grow in the intestine.

One can contract *Taeniasis* only when infected by the *cysticerci* because only *cysticerci* can develop in to adult tapeworms in the intestine. One can get *Cysticercosis* only when infected by the tapeworm eggs through auto-ingestion or ingestion of food contaminated with tapeworm eggs. The *hexacanth* larvae in the

eggs are then capable of cutting through the intestinal walls and developing into *cysticerci* in the tissues of, for example, brain and lungs.

Neurocysticercosis develops when cysticerci develop in the brain. It is the most common parasitic disease of the nervous system and is the major cause of acquired epilepsy in underdeveloped (Del Brutto et al. 2004) and in industrialized countries (Sinha and Sharma 2009). El-Gohary et al. (2008) report that epilepsy is the most common presentation of the complication of the disease and artificial neural network is a powerful tool in detecting bioelectric signals that arise due to epilepsy. Mbuba and Newton (2009) point out that epilepsy is the most common neurological disorder, affecting over 65 million people worldwide, of whom 80% are estimated to live in low- or middle-income countries (LICs). They observe that limited knowledge on epilepsy and its treatment, poverty, cultural beliefs, stigma, poor health delivery infrastructure, and shortage of trained health care workers influences the lack of efficient and effective treatment.

The Xhosa people engage in small-scale pig farming and free-ranging pigs is very common. Pork is also the cheapest meat available when compared to the prices of beef and lamb. Tapeworm related infection is attributed to poor sanitation, poor pig management, poor meat inspection and control, and cultural factors and human behaviour (Kriel 1997; Mafojane et al. 2003; Del Rio et al. 2007). The village infrastructure continues to be dilapidated even after almost two decades of the emergence of a post-apartheid democratic government (Del Rio et al. 2007).

Research on tapeworm and cysticercosis is not new in the geographical area where the present research was carried out. Well back in the mid 1960s, Heinz and MacNab (1965) interviewed and collected information from patients from rural Transkei and Ciskei and dug deep into the environmental causes of cysticercosis. However, their research did not cover the myths about the acquisition of the disease. Mafojane et al. (2003) included a wider area of Southern and Eastern African States in their study which focused on the facilities available to treat the patients and not on the myths and misconceptions. However, studies by Del Rio et al. (2007) reported on some myths and beliefs on tapeworms.



Mafojane et al. (2003) reviewed the available information on the epidemiology of NCC in Eastern and Southern Africa. They reported that geographically, the former Transkei and Ciskei of the Eastern Cape Province have the highest prevalence of NCC in South Africa. They, however, sounded the warning that the availability of better epidemiological information on cysticercosis in South Africa may be attributed to a greater awareness and more resources than in any other African countries. Studies by Foyaca-Sibat and Del Rio-Romero (2008) too identified the former homelands of Transkei and Ciskei in South Africa as areas with the highest prevalence of *Neurocysticercosis*. They attributed this high prevalence to the lack of proper sanitation and the common practice of free-range pig farming in these areas. Intervention measures, like educating the general population about the means of prevention for control of *Cysticercosis* have been reported (Hoese and Casem 2007). It had been observed that lack of sanitation and hygiene play a major role in spreading *Cysticercosis* amongst humans in Peru (Huisa et al. 2005) and in rural areas of Eastern Cape in South Africa (Foyaca-Sibat and Del Rio-Romero 2008).

### Research Questions

1. What are the beliefs of the sample regarding:
  - (a) how humans contract taeniasis in relation to the mode of infection and the possibilities of infection from water contaminated with tapeworm eggs?
  - (b) how humans contract cysticercosis in relation to the mode of infection and possibilities of getting cysticercosis from infected meat?
  - (c) the causes of epilepsy and indications from the onset of epilepsy?

## METHODOLOGY

### Research Design

This was a cross-sectional survey in which the survey was administered once off. Since the purpose was to gather beliefs before instruction on diseases were given, this design was identified as the most suitable.

### Population, Sample and Sample Selection

Convenience sampling was used. The sample consisted of 66 out of the 70 students (population) from the first year Health Promotion Education (HPE) class in the Faculty of Health Sciences. The members of the sample (19 males and 47 females) voluntarily participated in the study. All were above 18 years and were Xhosa.

### Instrument

The instrument was a researcher-designed questionnaire which was reviewed by two experts, piloted and modified based on the feedback. The questionnaire had 45 questions in 5 sections: (1) Demographic data; (2) Living environment; (3) Knowledge about taeniasis; (4) Knowledge about cysticercosis and (5) Questions for quantitative survey. Scientifically correct and incorrect options were mixed in the order of the given options A to D in the instrument.

### Validity and Reliability

A pilot study was done with a group of 12 first year HPE students. Validity is the extent to which an instrument measures what it is supposed to measure. The evaluation of the completed questionnaire and a discussion session with these students after they completed the instrument helped in modifying the questionnaire to enhance validity. The questions, words and sentences that were ambiguous and unclear were modified or redesigned. Explanations were added to unavoidable and difficult terms used. Reliability refers to consistency of measure, that is, the extent to which a given instrument yields the same result or score for all research subjects who possess similar attributes. Longer instruments (for example, questionnaires) tend to yield higher reliabilities than shorter ones. Since this was a short questionnaire, no reliability coefficient was calculated. Furthermore, suggestions from two experts were incorporated into the final instrument before administration to gather data for the main study.

### Data Analysis

The data were manually analysed and percentages were computed.

**Ethical Compliance**

Signed informed consent forms were obtained from each student who took part in the study. Permission was obtained from the Research Ethics Committee, Faculty of Health Sciences and the Head of the Department of HPE to conduct the research.

**Questionnaire Administration and Data Collection**

The sample completed the questionnaire in a one hour session where all members of the sample sat together separated by adequate space. The session was arranged at a time which did not clash with normal university contact learning/teaching time. About 40 to 50 minutes were taken to complete the questionnaire. The researchers themselves administered and collected back the completed questionnaires and also scored and recorded the data for analyses.

**RESULTS**

Table 1 depicts the analysed results for research question 1.

**Table 1: Beliefs on modes of humans contracting Taeniasis and possibilities of contracting Taeniasis**

<i>Beliefs</i>	<i>Per- cent- age %</i>	<i>Fre- que- ncy (n)</i>
<i>Modes of Infection in Taeniasis</i>		
- eating infected raw or uncooked meat	60.6	40
- eating food infected with tapeworm eggs	33.3	22
- cooked meat	4.5	3
- eating and eating wild animals' meat	1.5	1
<i>Possibilities of Contracting Taeniasis</i>		
- not possible to get Taeniasis by drinking water contaminated with tapeworm eggs	4.5	3
- possible to get Taeniasis by drinking water contaminated with tapeworm eggs	56.1	37
- possible sometimes and not possible at other times	30.3	20
- unsure	9.1	6

The response rates on the given options for the modes of infection in Taeniasis were as follows: Human beings contract Taeniasis by: eating infected raw or uncooked meat 60.6% (n=40)-the scientifically correct option; by eating food infected with tapeworm eggs (33.3%, n=22); eating cooked meat (4.5%, n=3); and eating wild animals' meat (1.5%, n=1).

The response rates on the given options for the possibilities of contracting Taeniasis were as follows: not possible to get Taeniasis by drinking water contaminated with tapeworm eggs (4.5%, n=3) - the scientifically correct option; possible to get Taeniasis by drinking water contaminated with tapeworm eggs (56.1%, n=37); possible sometimes and not possible at other times (30.3%, n=20); and unsure (9.1%, n=6).

About 40% had scientifically incorrect belief on how humans contract Taeniasis (by eating food infected with tapeworm eggs; eating cooked meat; and eating wild animals' meat). A majority (56.1%) had scientifically incorrect belief that it was possible to contract Taeniasis by drinking water contaminated with tapeworm eggs.

Table 2 depicts the analysed results for research question 2.

**Table 2 : Beliefs on the mode of infection in cysticercosis and the possibilities of contracting cysticercosis from infected meat**

<i>Beliefs</i>	<i>Per- cent- age %</i>	<i>Fre- que- ncy (n)</i>
<i>The Mode of Infection in Cysticercosis:</i>		
- infection by the eggs of a tapeworm	22.7	15
- ingestion of live Cysticerci on eating raw or uncooked pork	53	35
- on infection by worms	13.6	9
- infection by adult tapeworms	10.6	7
<i>The Possibilities of Contracting Cysticercosis from Infected Meat:</i>		
- not possible to contract Cysticercosis by eating measly pork	9.1	6
- possible to contract humans by eating measly pork	60.6	40
- possible sometimes and not possible at other times	16.7	11
- unsure	13.6	9

The response rates on the given options for the mode of infection in Cysticercosis were as follows: infection by the eggs of a tapeworm (22.7%, n=15)-the scientifically correct option; ingestion of live Cysticerci on eating raw or uncooked pork (53%. N=35); on infection by worms (13.6%, n=9; and infection by adult tapeworms (10.6%, n=7).

The response rates on the given options for the possibilities of contracting cysticercosis from infected meat were as follows: not possible to contract Cysticercosis by eating measly pork (9.1%, n=6)-the correct option; possible to con-

tract humans can contract by eating measly pork (60.6%, n=40); possible sometimes and not possible at other times (16.7%, n=11); and unsure (13.6%; n=9).

About 77% had scientifically incorrect belief on the mode of contracting cysticercosis (eating raw or uncooked pork ; infection by worms; and infection by adult tapeworms). A majority (60.6%, n=40) had scientifically incorrect belief that it was possible to contract cysticercosis by eating measly pork. They also had incorrect beliefs on getting cysticercosis from infected meat (on eating raw or uncooked pork; on infection by worms and infection by adult tapeworms).

Table 3 depicts the analysed results for research question 3.

**Table 3: Beliefs regarding the cause of epilepsy and the indications from onset of epilepsy**

<i>Beliefs</i>	<i>Per- cent- age %</i>	<i>Fre- que- ncy (n)</i>
<i>Causes Epilepsy:</i>		
- neurological disturbances due to foreign bodies or tumors in the brain	62.1	41
- visits from ancestors and spirits	23	15
-poverty and hunger leading to sickness	9	6
-disappointment and worries	6	4
<i>Indication from the Late Onset of Epilepsy:</i>		
- neurological disturbances due to Neurocysticercosis	19.7	13
- visits from ancestors and spirits	60.6	40
- tapeworm in the intestine	19.7	13

The response rates on the given options for the causes of epilepsy were as follows: neurological disturbances due to foreign bodies or tumors in the brain (62.1%, n=41)-the correct option; visits from ancestors and spirits (23%, n=15); poverty and hunger leading to sickness (9%, n=6); and disappointment and worries (6%, n=4).

The response rates on the given options for indication from the onset of epilepsy were as follows (in this case, there were only three options): neurological disturbances due to Neurocysticercosis (19.7%, n=13)-the correct option; visits from ancestors and spirits (60.6%, n=40); tapeworm in the intestine (19.7%, n=13).

About 38% had scientifically incorrect beliefs on the causes of epilepsy (visits from ancestors and spirits; poverty and hunger leading to sickness and disappointment and worries). A

majority (80.3%) had scientifically incorrect beliefs on the late onset of epilepsy (visits from ancestors and spirits and due to tapeworm in the intestine).

**Overall Inferences**

The overall inferences from the analysed data were that incorrect beliefs could be isolated and these were: (i) humans can contract taeniasis (by eating food infected with tapeworm eggs; eating cooked meat; and eating wild animals’ meat); (ii) humans can contract taeniasis by drinking water contaminated with tapeworm eggs; (iii) humans can contract cysticercosis by eating raw or uncooked pork ; infection by worms; and infection by adult tapeworms; (iv) the cause of epilepsy is due to visits from ancestors and spirits, poverty and hunger leading to sickness and disappointment and worries; (v) the onset of epilepsy is caused by visits from ancestors and spirits and due to tapeworm in the intestine.

**DISCUSSION**

The demographic data indicated that the respondents were Xhosa and adults who were 18 years old or above. There was lack of knowledge about tapeworms among the Xhosas also, similar to reports from studies outside the African continent as reported by Tambongco (2004) and Mbuba and Newton (2009). As was mentioned earlier, myths and beliefs are part of every culture. Bhasin (2007a: 6) states, “All over the world, people believe in spirits, Evil-eye, Sorcery, and Witchcraft as the root causes of sickness”. The Xhosa culture, myths and beliefs in South Africa are not exceptions. The results of this study show examples of beliefs on supernaturals causing diseases and about superstitions in South Africa’s Xhosas which are similar to those in other countries in the African continent, for example, in Nigeria’s Yoruba tribe (Ogundele 2007) and in Zimbabwe’s Shona tribe (Shoko and Burch 2010) and outside the African continent, for example, in India’s Sonowal Kacharis in Assam (Das et al. 2008), tribal groups of Rajasthan (Bhasin 2007b) and Gaddis in Himachal Pradesh (Bhasin 2008a). Lifestyles influence preventive action which humans take in order not to contract diseases and have implications for the health of citizens

(Bhasin 2007a). Myths and scientifically incorrect beliefs on the mode of transmission of diseases and contracting them have repercussions on people's lifestyles and myths influence lifestyles (Watson and Kopnick 1990; Tekkaya 2003). In the context of Sahu et al.'s (2010) report referring to 80% of the world's population depending on traditional medicine and on traditional healers, traditional healers play a role in propagating myths and scientifically incorrect beliefs. As far as the Xhosas are concerned, Foyaca-Sibat et al. (2005) reported that traditional healers play a prominent role in myth propagation. Del Rio et al.'s (2007) report shows that a large number of Xhosas seek epileptic treatment from traditional healers. Furthermore, in South Africa where traditional healers continue to be the main healthcare providers (Pretorius 1999; Del Rio et al. 2007), the influence of traditional healers on people's life style is quite pertinent.

This study justifies the findings of Heinz and MacNab (1965), Foyaca-Sibat et al. (2004, 2005) and Del Rio et al. (2005) on superstitions and misconceptions existing in the communities of Eastern Cape. The results from the present study confirm the results of Foyaca-Sibat et al.'s (2004, 2005 and 2008) and Del Rio et al.'s (2005) case studies of individual villages of the rural Transkei region of Eastern Cape in South Africa that superstitions and misconceptions on taeniasis, neurocysticercosis and epilepsy are common in the villages and that they persist.

The results from Del Rio et al. (2007) showed that 76% of persons in a village in Transkei in South Africa lived without knowledge about epilepsy. Since the cohort of this study is from Transkei region, this may be one of the contributory factors why one-third of the cohort had a wrong belief that epilepsy can be caused by visitations from evil spirits.

Mafojane et al. (2003), Foyaca-Sibat and Del Rio-Romero (2008) found the highest prevalence of neurocysticercosis in the Eastern Cape province out of the nine provinces in South Africa. This tallies well with the findings of this study where 77.3% of the cohort had incorrect beliefs on the mode of infection in cysticercosis and 90.9% of the cohort had incorrect beliefs on the possibilities of getting cysticercosis (human beings get cysticercosis by eating pork meat containing cysticerci, measles pork). This indicates that there seems to be an association between

the prevalence of neurocysticercosis and scientifically incorrect beliefs. The studies done by Foyaca-Sibat et al. (2004, 2005) and Foyaca-Sibat and Del Rio-Romero (2008) also reported ignorance about the transmission, causes of neurocysticercosis and superstitions about epilepsy manifestations.

In terms of the observations worldwide by Mbuba and Newton (2009), in South Africa by Del Rio et al. (2007) and in India by Dhargupta et al. (2009) on the negative impact of socio-economic parameters on health issues in general and the statistics portrayed by Del Rio et al. (2007) on the poor socio-economic parameters and health issues in South Africa cited earlier in particular, the work of health educators in South African tribal villages deserve urgent, serious and constructive attention.

## CONCLUSION

The following myths and incorrect beliefs were identified as part of the Xhosa culture: (i) people can get *Taeniasis* (adult tapeworm infection) by ingesting tapeworm eggs; (ii) people can get *Cysticercosis* by eating uncooked or undercooked measles pork (by ingesting cysticerci); (iii) *Epilepsy*, blackout and state of stupor periodically observed in people with Neurocysticercosis, is caused by visitations from their ancestral spirits or evil spirits. Surely, myths and beliefs are part of the culture and are usually resistant to change. However, efforts to minimize if not eradicate them would go a long way in enabling tribal communities to adopt appropriate medical precautions before they get infected and to seek health care before matters get worse. The value of traditional healers as providers of primary health care cannot be ignored. As such, exposing the scientific incorrectness of such myths and incorrectness to traditional healers would not only assist them in providing appropriate care to the many who approach them for primary health care but also benefit the patients who go to them for primary health care.

Despite research evidence showing results such as the highest prevalence of neurocysticercosis in the Eastern Cape province and that a large number of Xhosas seek epileptic treatment from traditional healers, health education in the Eastern Cape Province has not taken adequate steps to eradicate many medical myths



and incorrect medical beliefs. The findings of the present study although limited to certain factors on taeniasis, cysticercosis and epilepsy show that entrants for university qualifications in health education also come with myths, scientifically incorrect beliefs and misconceptions.

Within the constraints of cultural beliefs, stigma, poor health delivery infrastructure, and shortage of trained health care workers influencing the lack of efficient and effective prevention and treatment, the road ahead to overcome scientifically incorrect myths and beliefs will continue to be a challenge. Nonetheless, efforts to minimize myths and incorrect beliefs if not completely eradicate them from tribal villagers will surely go a long way in controlling incidences of contracting diseases, improving health and minimizing deaths as preys to taeniasis, epilepsy and neurocysticercosis.

### RECOMMENDATIONS

Inclusion of scientific ideas on the mode of infection of taeniasis, cysticercosis and the causes of epilepsy should be pursued as a means to eradicate scientifically incorrect beliefs through school curricula. Furthermore, training health educators with scientifically correct conceptions and their active role in eradicating myths ought to be considered as a matter of priority not only amongst tribal villages in South Africa but also tribal communities internationally. Development of a healthy human capital from villages is significant for the development of every country.

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