



# THE CENTRAL AFRICAN JOURNAL OF MEDICINE

Vol. 56, Nos. 1/4

CONTENTS

January/April 2010

## EDITORIAL

Challenges for undergraduate medical education in Africa.....

J Cookson.....1

## ORIGINAL ARTICLES

Knowledge, attitudes and practices among pregnant women on intermittent presumptive therapy in Guruve District Zimbabwe.....

HT Mahaka, PL Chisango.....4

Directly Observed Treatment Short Course (DOTS) appears to have reduced the self-care role of the pulmonary tuberculosis patient: evidence from a Correlational study between Personal Health Beliefs and Self-Care Practices (SCP).....

HV Gundani, H Watyoka, C Nyathi, AP Charumbira.....7

## REPORTS

A report on the Zimbabwe Antiretroviral Therapy (ART) programme progress towards achieving MDG6 Target 6B: Achievements and Challenges.....

T Apollo, K Takarinda, O Mugurungi, C Chakanyuka, T Simbini, AD Harries.....12

## CASE REPORTS

Tubular ectasia of the rete testis associated with azoospermia: a case report.....

D Ndlovu, AP Danso.....14

Intra-abdominal gossypiboma: a report of two case and a review of literature.....

JAU Kpolugbo, M Abubakar.....17

## NOTES AND NEWS

Instructions to Authors.....

*Central African Journal of Medicine*.....19

## SUPPLEMENT

Fifth African Radiation Oncology Group Conference (AFROG) Abstracts.....

.....S1-S30

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Owned and Published by the Central African Journal of Medicine in Conjunction with the College of Health Sciences, University of Zimbabwe.



University Of Zimbabwe

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# Directly Observed Treatment Short Course (DOTS) appears to have reduced the self-care role of the pulmonary tuberculosis patient: evidence from a correlational study between Personal Health Beliefs (PHB) and Self-Care Practices (SCP)

\*HV GUNDANI, \*H WATYOKA, \*\*C NYATHI, \*AP CHARUMBIRA

## Abstract

**Objective:** To examine the relationship between personal health beliefs and self-care practices among 69 PTB patients aged 25 to 65 years at a tuberculosis clinic in Zimbabwe, in order to determine the role patients can play in self-care.

**Design:** Analysis of collected demographic data, personal health beliefs (PH B) and self-care practices (SCP) of PTB patients.

**Settings:** Gwanda Provincial Hospital (GPH) Tuberculosis Clinic.

**Participants:** PTB patients in the (GPH) register who were taking treatment.

**Interventions:** Key components of the study included administration of an interview schedule to 69 PTB patients on treatment, and the analysis and comparison of personal health beliefs and self-care practices.

**Main Outcome Measures:** Scores of personal health beliefs, self-care practices, perceived self-efficacy, perceived threats, and cost-benefit analysis.

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**Results:** Sixty- nine PTB patients with a median age of 38, screened during the month of March, 2009, showed a weak positive Pearson's Correlational Coefficient of ( $R^2=0.177$ ), indicating that personal health beliefs may have some influence on self- care practices. The regression analysis showed an association of 3.1%, thus health beliefs are responsible for self-care undertaken by 3.1 in a 100 PTB patients.

**Conclusions:** Directly Observed Treatment Short Course (DOTS) seems to have reduced the self-care practice of PTS patients. It seems the PTB patient has a potential role to play in the management of his own treatment.

*Cent Afr J Med 2010;56(1/4) 7-11*

## Introduction

Tuberculosis (TB) affects the poorest in the world, 95% of the new cases reported every year are from developing countries.<sup>1</sup> In Zimbabwe TB was ranked<sup>10<sup>th</sup></sup> public health problem and<sup>5<sup>th</sup></sup> condition that cause hospital morbidity and mortality among People Living With HIV/ AIDS (PLWA).<sup>2</sup> In the same year Harare City Health Department reported an increase of new cases from 2.99% in 2002 to 9.3% in 2003.<sup>2</sup> (WHO Health Facility Based Data/ Standard Supplementary/ Health March, 2010) also estimated the TB./HIV/AIDS co-infection at 72% in Zimbabwe. TB infection affects all age groups and can seriously interfere with a person's quality of life.<sup>5</sup> Hence TB remains a challenge that requires effective strategies that can facilitate the reduction of the disease burden by TB patients. World Health Organization (WHO) recommended DOTS as a modality that can effectively deal with issues of adherence to TB treatment.

(DOTS) is the main strategy used to facilitate TB treatment at clinics, at work, and in the home in Zimbabwe. It is seen as a facilitation of compliance. While DOTS is seen as a facilitation of compliance in some patients, it does so without the respect of the patient's self-care agency.<sup>8</sup> DOTS, is also seen as a tool that can improve self-care practices of adherence to TB treatment. Worldwide effectiveness of DOTS is hindered by several factors namely; health centre accessibility, transportation systems, health centre opening times, long lines, and stigmatization.<sup>9</sup> The investigators also felt that DOTS contributed to the stigmatization of TB patients; because patients feel they are seen as HIV&AIDS sufferers and may hence not like to be associated with them. TB treatment is a self-care practice.<sup>6</sup> Some studies however, criticize DOTS as a rigid strategy where a second person supervises another's treatment, and hence add to stigmatization.<sup>7</sup> Researchers allege that DOTS is a method that is extremely authoritarian in nature as it removes patients' autonomy, and ability to make choices about their own health and self-care. DOTS believers assert that successful adherence cure rates can only be achieved by DOTS and not through unsupervised patient driven treatment plans.

Personal health beliefs are the major cause of non-compliance in many treatment regimens.<sup>10</sup> Self-care interventions will and sometimes can be detrimental to individuals' health<sup>11</sup>. Health care practice through-out the world is influenced by cultural beliefs, values, and customs.<sup>11</sup> The beliefs can affect the self- care practices,

the health seeking patterns and the compliance patterns of patients.<sup>12</sup> Given this scenario, it is important for health care practitioners in Zimbabwe to understand how PTB patients' personal beliefs can influence their self-care practices. The investigators therefore, thought it necessary to find out what the PTB patients' personal health beliefs and self-care practices were on the ground, and whether these influenced their self-care practices. Strategies for self-care measures, and treatment of PTB should be understood by individuals<sup>11</sup>. Slightly more than seventy (70.2%) of PTB participants had moderate level of self- care and 27.7% had a higher level of self-care<sup>15</sup>. The purpose of our study was to establish the relationship between personal health beliefs; and self-care practices with a view to determine the potential role that PTB patients can play in their own treatment. If the relationship exists PTB patients could be left to manage their own treatment without a second person.

## Materials and Methods

The investigators used a questionnaire survey design. PTB patients on treatment responded to three questionnaires written in English and Ndebele. Questionnaires solicited participants' responses on their demographics and disease status, personal health beliefs, and self-care practices. The responses were generated in concrete terms during the month of March, 2009. The instrument was composed of multiple-choice questions which are less subjective to variance, and are thus easier to score and analyze. Additionally, factors most helpful in determining the relationships among variables were identified. Thirty-seven men and thirty-two women, ranging from 25 to 65 years of age with a (mean of 39.26, STD =10.99, median age of 38) participated in this study. Over half 39(56.5%) were from Gwanda town and the remainder were from mines, farms and rural settings.

A randomized sample of 69 participants, were chosen from a list of PTB patients in the hospital register. PTB patients, aged 25- 65 years on treatment and who stayed in Gwanda during the month of March, 2009 were eligible for the study. Patients below 25 years and those above 65 years, those with extra- pulmonary Tuberculosis, and those who could not speak, read either English or Ndebele, the language for the area, were excluded from the study.

Investigator 3 meticulously captured the exact responses given by the participants. The questionnaires were later analyzed for meaning by the investigators.

Investigator 3 screened and interviewed the eligible sixty-nine participants individually, after giving informed written consent based on the laid out inclusion criteria. Participants had the option to withdraw from the study at any time if they so wished. Privacy and confidentiality were ensured throughout the process.

Simple percentages were used to estimate rates on personal beliefs and 95% Confidence Intervals (CIs) were based on the score method. Mean, medians and ranges were used to summarize continuous data. Logistic regression was used to evaluate the effectiveness of personal beliefs variances. Logistic regression model and 95% CIs were based on profile likelihood. Multivariable logistic regression analysis, a two way interaction evaluation was used between the two relationships, personal beliefs and self-care practices components and a weak significant interaction was realized. Analyses were done using SPSS.

Permission to carry out the study and to report on PTB patients' reactions on the study variables was obtained from Zimbabwe Research Council Board and the (GPH) Superintendent.

## Results

The mean age of the 69 PTB patients interviewed was 39.26, their Standard Deviation was 10.98, their median age was 38, and their modal age was 48. The majority of the participants 39(56.5%) were Gwanda urban residents. Thirty (43.5%) had attained an educational level of high school. Twenty six (37.7%) were in gainful employment and they indicated ability to purchase medication from private pharmacies in the event of stock outs.

Participants were asked to indicate their responses to the common causes of PTB illness, and how they perceived their illnesses. Thirty-eight (55.1%) attributed PTB to environmental pollution, 27(39.2%) attributed it to staying with infected persons and those who attributed it to smoking and breaking cultural rules were 2(2.9%) either way. On nature of illness, 55(79.7%) participants stated that it was PTB, 9(13.0%) stated it was HIV/AIDS and 5(7.2%) considered it to be just an illness.

Table I: PTB patients' personal health beliefs indicators : (N=69).

Characteristic/Indicator	Frequency/Percentage
<b>1(a) Causes of PTB illness</b>	
Breaking cultural rules	2 (2.9)
Environmental pollution	38 (55.1)
Smoking	2 (2.9)
Staying with infected persons	27 (39.1)
<b>1(b) Perception of nature of illness</b>	
AIDS	9 (13.0)
Pulmonary tuberculosis	55 (79.7)
Just an illness	5 (7.2)

Table I(b): PTB patients' personal health beliefs indicators: (N=69).

Characteristic/Indicator	Frequency/Percentage
<b>1(a) Causes of PTB illness</b>	
Breaking cultural rule	2 (2.9)
Environmental pollution	38 (55.1)
Smoking	2 (2.9)
Staying with infected persons	27 (39.1)
<b>1(b) Perception of nature of illness</b>	
AIDS	9 (13.0)
Pulmonary tuberculosis	55 (97.7)
Just an illness	5 (7.2)

Table II showed PTB patients who had trust in taking medication with or without a DOTS supervisor. The majority of the participants 54(72.5%) indicated that they had total trust in taking their medication without supervision, 7(10.1%) had no trust in taking medication without supervision, and the remainder, 8(11.5%) had some trust in taking their medication.

Table II: PTB patients' self care practices indicator: (N=69).

Characteristic/Indicator	Frequency/Percentage
<b>Trust in taking medication with/without supervision</b>	
Patients without trust in self	7 (10.1)
Patients with little trust	3 (4.3)
Patients with moderate trust	5 (7.2)
Patients with total trust	54 (72.5)

Total (PHB) and (SCP) scores and total scores of the concepts within the health belief model: Multivariate analysis.

The total possible score of PHB was 58(100%). One hundred percent scored between 39 and 52 out of 58. The mean score was 45.9 and the Standard Deviation was 2.60 and the total score of SCP ranged from 16 to 22 out of 25. The mean score was 19.4, and Standard Deviation was 1.34. The total scores for concepts within the (HBM) (perceived threats, perceived self-efficacy and cost-benefit analysis) were computed. Perceived threats scores ranged from 12 to 22 out of 25, the mean score was 17.4493 and 50 was 0.2421, perceived self-efficacy ranged 13 to 20 out of 20, the mean score was 17.2754, and 50 was 2.401, and cost benefit analysis ranged from 9 to 13 out of 13, the mean score was 11.1884 and 50 was 0.8957.

The correlation of these concepts indicated a positive low correlation of ( $r=0.301$ ,  $P<0.05$ ) between self-efficacy and cost benefit analysis. Results of fitting a multivariable logistic regression model to the data, which included the two components between perceived self- The correlation of these concepts indicated a positive low correlation of ( $r=0.301$ ,  $p<0.05$ ) between self-efficacy and cost benefit analysis. Results of fitting a multivariable logistic regression model to the data, which included the two components between perceived self-efficacy and cost-benefit analysis, ( $r^2=0.091$ ) indicated that the cost-benefit analysis explained the 9.1% of variance in self-efficacy. The correlation analysis of the other

concepts produced insignificant correlations. Perceived threats had a low negative correlation with

perceived self-efficacy of ( $r^2=-0.218, p<0.05$ ).

Table III: Multivariable analysis of correlation between different concepts.

Study Variables	Cost Benefit Analysis	Self-Efficacy	Perceived Threats	Self Care
	<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
Cost benefit analysis	0.0	0.0	0.0	0.0
Self-efficacy	0.301*	0.0	0.0	0.0
Threats	0.050	0.218	0.0	0.0
Self-care	0.0310	0.073	0.158	0.0

$p<0.05^*$

Table IV: Univariate analysis of correlation between selfcare and health beliefs.

Study variables	B	SEB	BETA
Constant (Self care)	15.241	2.850	0.0
Health beliefs	9.100E-02	0.062	0.177
$R^2=0.031^*$	$F=2.158$		

$p<0.05^*$

(n=69)

## Discussion

Gwanda Provincial Hospital reported a high PTB&HIV positivity rate of eighty- two percent<sup>2</sup>. Our study demographic data confirmed a similar pattern 55(79.7%). It also showed that 58(84.1%) participants kept their own PTB medicines. This reflects that patients can keep and take their own medicines. It might be prudent for individuals to keep their medicines.<sup>13</sup> It might not be necessary for TB patients to have a second person observe them take medication. Sixty- five (94.2%) of the participants never missed their doses, and those that missed their doses, did so because of circumstances beyond their control. Some patients may avoid hospitals/clinics because of DOTS and its negatives factors namely inaccessibility, opening times, and stigmatization.<sup>9-18</sup>

The study findings' scores of (PHB) showed a sound grasp of patients' personal health beliefs. In our study the majority 67 (97.1%) of the participants knew the causes of PTB and only 2(2.9%) related it to breaking cultural rules. The responses demonstrated that the majority of TB patients understood the causes of TB. However, South African communities strongly believe in the power of the supernatural spirits or (sangomas) as causes of their chronic illnesses.<sup>19</sup>

Forty- five (65.2%) participants revealed knowledge of TB disease progression; 9(13.0%) believed illness will not end and 13 (18.8%) were not sure. Such beliefs assist to ensure treatment adherence. However, the ultimate outcome of such beliefs could be poor compliance, medication disruption and ineffective self- care. In our study threats had a positive but, weak correlation with self-

care of ( $r=0.158$ ). In self-care the patient is the most useful treatment tool and this also indicates that the patient has the required autonomy to direct his care<sup>6</sup>.

The majority of the participants 65(94.2%) indicated that they were responsible for their own care, and 48(69.6%), also indicated their fitness to perform self-care and being in control of their health. A further 60(87.0%) felt confident to undertake self-care. This shows that patients have the capacity to manage their own TB treatment. Patients are capable of taking care of their treatment.<sup>15</sup> Nurses and doctors therefore, should encourage TB patients to take their medication without a second person if there are no treatment problems; and they should also facilitate self- care activities in the management of TB.

In our study the self-care scores showed that most patients had a sound understanding of self-care. Slightly over seventy percent (70.2%) of the participants had moderate and 27.7% had high levels of self-care<sup>15</sup>. DOTS, is seen as a rigid strategy that hinders PTB patients' autonomy in their own treatment.<sup>7</sup> According to our study findings DOTS reduces clients' self-care practices.

Correlating the concepts according to the (HBM), a positive low correlation of ( $r^2=0.301, p<0.05$ ) was noted between self-efficacy and cost benefit analysis as shown in (Table 111). Cost benefit analysis had a positive influence on self-efficacy and increased participants' understanding of self-care which in turn increased their self-care confidence. Health beliefs and self-care practices had a positive but weak correlation ( $R^2=0.177$ ).

A regression analysis result of ( $R^2 =0.031$ ) indicated that health beliefs explained a 3.1% variation in self-care practices (Table 1 V). Thus only 3.1% of PTB patients in a 100 undertook self-care and were influenced by their personal health beliefs. Accordingly, personal health beliefs of PTB patients have little impact on their self-care practices. The remaining (96.95%) of the PTB patients undertook treatment according to the DOTS system regardless of how they felt. This finding showed that most PTB patients felt not empowered to take full control of their treatment.

## Conclusion and Recommendations

The main study finding was that PTB patients can play a more meaningful role in their own treatment without a DOTS supervisor if they are empowered. In addition, the study found that personal health beliefs have a weak influence on self-care practices in the management of PTB. This study has also shown that health care workers still have a meaningful role to influence positive self-care practices in PTB patients' treatment.

Nurses, are encouraged to develop educational programs that empower PTB patients. It is important that further research be carried out, with larger samples and at different site; to gather additional information on factors that influence the relationship between personal health beliefs and personal self care practices of PTB patients in Zimbabwe.

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