



UNIVERSITI PUTRA MALAYSIA

***EFFECTIVENESS OF PHOTOVOICE METHOD IN IMPROVING
TUBERCULOSIS KNOWLEDGE, ATTITUDE, PRACTICE AND
TREATMENT OUTCOMES AMONG TUBERCULOSIS PATIENTS IN A
HOSPITAL IN NIGERIA***

ABDULRAHMAN AHMAD

FPSK(P) 2017 16



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By

ABDULRAHMAN AHMAD

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in fulfillment of the Requirements for the Degree of Doctor of Philosophy**

June 2017

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DEDICATION

This study is dedicated to Almighty God who gave the candidate the wisdom and strength to go through the challenges of this study.



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the Degree of Doctor of Philosophy

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June 2017

Chairman : Professor Lye Munn Sann, MBBS, MPH, DrPH
Faculty : Medicine and Health Sciences

Background: Tuberculosis (TB) is a disease of public health importance especially in developing countries and among the low socioeconomic class. It is estimated that TB is second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent. In 2013 alone, 9 million people were infected with TB, and 1.5 million died from the disease. Over 95% of TB deaths occur in low- and middle-income countries, and it is among the top 5 causes of death for women aged 15 to 44 years.

Knowledge of TB is shown to correlate with a positive attitude and better preventive practices towards the disease. However, knowledge of the disease is shown to be low among different populations, particularly in African populations. Among West African nations, Nigeria reported the lowest knowledge levels of TB. The lack of awareness may lead to subsequent exposures to the risk factors of TB, which would result in an increased number of TB patients who in turn will infect other people. This results in more poverty and ignorance thereby completing the cycle of ignorance, disease, and poverty. This vicious cycle will continue if there is inadequate knowledge, attitude, and practice regarding the disease.

Objective: To develop, implement, and evaluate the effectiveness of photovoice health education method in improving TB knowledge, attitude, practice, self-efficacy, and treatment outcome among TB patients in Specialist Hospital Sokoto, Nigeria.

Methodology: This study was a two armed double-blind randomized controlled trial. The trial was conducted in two phases; phase 1 was the development of the photovoice intervention using social cognitive theory, which involved recruitment of volunteers, training, and recording of the photovoice video, and phase 2 was the randomized control trial. Two hundred (the calculated sample size $n=200$) newly diagnosed TB patients were recruited for the study all from one center and randomly allocated to intervention and control arms on a one to one ratio. Only one person facilitated throughout, self-administered validated questionnaire and case report forms were used to record data for the study. The intervention group was exposed to the photovoice video on day one of TB treatment and again at the eighth week after the commencement of anti-TB medications. The control group was exposed to usual TB care and HIV health education on day one and the eighth week after the commencement of anti-TB drugs. Photovoice method in this study is a recorded video showing successfully treated TB patients educating and motivating newly diagnosed TB patients. Outcome data were collected at baseline, immediately post-intervention, two months and six months post-intervention. Outcome measures included: TB knowledge, attitude, practice, self-efficacy and treatment outcomes.

Results: Two hundred newly diagnosed TB patients agreed to participate in the study. One hundred and seventy-two (172) participants remained until the end of the study, 92 in the intervention group and 80 in the control group. Analysis of the data showed there was no statistically significant difference in the participants' baseline data between intervention and control groups. However, photovoice group had higher mean knowledge score ($p < 0.001$) compared with the control group. Photovoice group had higher mean attitude score ($p < 0.001$) compared with the control group. Photovoice group had higher mean practices score ($p < 0.001$) compared with the control group. Moreover, photovoice participants had a higher mean self-efficacy score ($p < 0.001$) compared with the control group. Similarly, photovoice group have 3 times the odds of successful treatment outcome compared with the control group ($p\text{-value} = 0.019$).

Conclusion: Photovoice method is an effective intervention tool for use to improve knowledge, attitude, practice, self-efficacy, and TB treatment outcomes (successful vs unsuccessful) among the newly diagnosed TB patients.

Keywords: Tuberculosis; photovoice; knowledge; attitude; practice; self-efficacy; Sokoto

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Doktor Falsafah

**KEBERKESANAN KAEDAH PHOTOVOICE DALAM MENINGKATKAN
PENGETAHUAN TUBERCULOSIS, SIKAP, AMALAN DAN HASIL
RAWATAN DALAM KALANGAN PESAKIT TUBERCULOSIS DI
HOSPITAL DI NIGERIA**

Oleh

ABDULRAHMAN AHMAD

Jun 2017

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Latar Belakang: Tuberculosis (TB) adalah penyakit yang penting dalam kesihatan awam terutamanya di negara-negara membangun dan dalam kalangan kelas sosio-ekonomi yang rendah. Dianggarkan bahawa TB adalah kedua selepas HIV/AIDS sebagai pembunuh utama di seluruh dunia disebabkan oleh agen jangkitan tunggal. Pada tahun 2013 sahaja, 9 juta orang dijangkiti dengan TB dan 1.5 juta mati akibat penyakit ini. Lebih 95% daripada kematian TB berlaku di negara-negara berpendapatan rendah dan sederhana, dan ia adalah dalam kalangan teratas 5 punca kematian bagi wanita yang berusia 15 hingga 44 tahun.

Pengetahuan TB telah didapati berkait dengan sikap positif dan amalan pencegahan yang lebih baik terhadap penyakit itu. Walau bagaimanapun, pengetahuan tentang penyakit ini didapati adalah rendah dalam kalangan penduduk yang berbeza termasuk Afrika. Antara negara-negara Afrika Barat, Nigeria melaporkan tahap paling rendah pengetahuan mengenai TB. Kekurangan pengetahuan boleh membawa kepada pendedahan selanjutnya kepada faktor-faktor risiko TB yang menyebabkan peningkatan pesakit TB dan seterusnya akan menjangkiti orang lain. Ini akan menyebabkan lebih banyak kemiskinan dan kejahilan sekali gus melengkapkan bulatan kejahilan, penyakit dan kemiskinan. Rangkaian sebab dan akibat ini akan berterusan jika pengetahuan yang mencukupi tentang penyakit ini tidak diberikan kepada khalayak.

Objektif: Untuk membangunkan, melaksanakan dan menilai keberkesanan photovoice kaedah pendidikan kesihatan dalam meningkatkan pengetahuan TB, sikap, amalan, efikasi sendiri dan hasil rawatan dalam kalangan pesakit TB di Hospital Pakar Sokoto, Nigeria.

Metodologi: Kajian ini dijalankan secara percubaan rawak terkawal buta berganda dua kumpulan. Ia telah dijalankan dalam 2 fasa, fasa 1 adalah pembangunan 'photovoice' menggunakan teori kognitif sosial, yang melibatkan pengambilan sukarelawan, latihan dan rakaman kaedah 'photovoice' dan fasa 2 adalah penyampaian photovoice itu. Dua ratus (saiz sampel yang dikira $n=200$) pesakit TB yang baru didiagnosis telah diambil untuk kajian yang semuanya dari satu pusat; dan secara rawak diperuntukkan kepada kumpulan intervensi dan kawalan dengan nisbah satu kepada satu. Intervensi ini telah dikendalikan oleh hanya seorang keseluruhannya, borang soal selidik isi sendiri yang dibantu pembantu dan borang laporan kes telah digunakan untuk mendapatkan data untuk kajian. Kumpulan intervensi telah didedahkan kepada photovoice pada hari pertama dan juga minggu kelapan permulaan ubat anti-TB. Kumpulan kawalan telah didedahkan kepada penjagaan TB biasa dan pendidikan kesihatan HIV pada hari pertama dan minggu kelapan permulaan ubat anti-TB. 'Photovoice' dalam kajian ini merupakan rakaman video yang menunjukkan pesakit TB yang berjaya dirawat, mendidik dan memotivasikan pesakit TB yang baru didiagnosis. Data hasil telah dikumpulkan pada permulaan, serta-merta selepas intervensi, dua bulan dan enam bulan selepas intervensi. Pengukuran hasil kajian termasuk: pengetahuan TB, sikap, amalan, efikasi sendiri dan hasil rawatan.

Keputusan: Dua ratus pesakit TB yang baru didiagnosis bersetuju untuk mengambil bahagian dalam kajian ini. Seratus tujuh puluh dua (172) orang peserta kekal sehingga akhir kajian, 92 dalam kumpulan intervensi dan 80 dalam kumpulan kawalan. Analisis data menunjukkan tidak terdapat perbezaan statistik yang signifikan pada permulaannya antara kumpulan intervensi dan kawalan. Walau bagaimanapun, terdapat perbezaan statistik yang signifikan dalam min skor responden dalam semua pemboleh ubah bersandar yang diukur antara kumpulan intervensi photovoice dan kumpulan kawalan selepas intervensi. Untuk skor pengetahuan TB ($p < 0.001$); skor sikap terhadap TB ($p < 0.001$); amalan terhadap TB ($p < 0.001$) dan efikasi sendiri terhadap rawatan TB ($p < 0.001$). Begitu juga, para peserta photovoice mempunyai 3 kali kemungkinan hasil rawatan berjaya berbanding dengan kumpulan kawalan ($p = 0.019$).

Kesimpulan: Intervensi photovoice merupakan bahan intervensi yang berkesan untuk digunakan bagi meningkatkan pengetahuan, sikap, amalan, efikasi sendiri dan hasil rawatan TB dalam kalangan pesakit TB yang baru didiagnosis.

Kata kunci: Tuberculosis; photovoice; pengetahuan; sikap; amalan; efikasi sendiri dan Sokoto.

ACKNOWLEDGEMENTS

This medium is to acknowledge the contributors to this thesis. The immense technical contributions from Prof. Dr. Dato' Lye Munn Sann, Prof. Dr. Mohammed Taofeek Olalekan Ibrahim, Assoc. Prof. Dr. Hejar Abdul Rahman and Dr. Firdaus Mukhtar towards this study are acknowledged. This thesis would not have been possible without their support.

I also want to acknowledge my parents, wife, brothers and sisters, my kids for all their support and understanding during the conduct of this study. Similarly, I would want to acknowledge all my teachers from primary school to date for shaping my life educationally; without you all, this study would not have been possible.

Finally, I want to acknowledge the people that actually make this project a reality who include Ministry of Health, Sokoto through Honorable Commissioner Dr Balarabe Shehu Kakale, Sirajo Ladan, Zayyanu Abubakar Imani, and Umar Alhaji Musa. Others include Hauwau Abubakar, Umar Yahaya, Abubakar S Fada, Wadata Hali, Hajiya Rabi Mada, Mukhtar Umar, Abdullahi Bello Gada, Malam Shafiu Bello Gada, Dr. Bilyaminu Balarabe Sifawa, Dr. Dahiru Bello, Mustapha Ahmad, Abubakar Ahmad, Imrana, Mustapha, Monday, Murtala, Hajiya Rabi Kaoje, Mama Lego and Hajiya Rabi Kuchi.

I certify that a Thesis Examination Committee has met on 23 June 2017 to conduct the final examination of Ahmad, Dr Abdulrahman on his thesis entitled "Effectiveness of Photovoice Method in Improving Tuberculosis Knowledge, Attitude, Practice and Treatment Outcomes among Tuberculosis Patients in a Hospital in Nigeria" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Doctor of Philosophy.

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LIST OF ABBREVIATIONS

AFB	Acid Fast Bacilli
AIDS	Acquired Immune Deficiency Syndrome
ANOVA	Analysis of Variance
ART	Anti-retro viral Therapy
BCG	Bacille Calmette Guérin
BMI	Body mass index
CDC	Centre for Disease Control
CI	Confidence Interval
CXR	Chest X-ray
df	Degree of Freedom
DM	Diabetes Mellitus
DOT	Directly Observe Treatment
DR_TB	Drug-resistant TB
EPTB	Extra Pulmonary tuberculosis
ESRD	End Stage Renal Disease
F	F-value
f	frequency
HADS	Hospital Anxiety and Depression Scale
HIV	Human Immunodeficiency Virus
LPAs	Line Probe Assays
MDG	Millennium Development Goal
MDR-TB	Multidrug-resistant tuberculosis
MTB	Mycobacterium tuberculosis
MTBC	Mycobacterium tuberculosis complex

N	Total number
n	number in the sub-group
η^2	Partial Ita square
NAAT	Nucleic Acid Amplification Test
NTBLCP	National Tuberculosis and Leprosy Control Program
OR	Odds Ratio
PLHIV	People Living with Human Immunodeficiency Virus
PTB	Pulmonary tuberculosis
SD	Standard Deviation
SE	Standard Error
TB	Tuberculosis
UK	United Kingdom
WHO	World Health Organization
XDR	Extensive Drug Resistance
UPM	Universiti Putra Malaysia

CHAPTER 1

INTRODUCTION

1.1 Background

Tuberculosis (TB), a chronic infectious disease caused by bacteria *Mycobacterium tuberculosis*, is of public health importance especially in the developing countries and among populations with low socioeconomic status (WHO, 2014e).

It was estimated that TB is second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent. In 2013 alone, 9 million persons were infected with TB, and 1.5 million died from the disease. Over 95% of TB deaths occur in low- and middle-income countries, and it is among the top 5 causes of death for women aged 15 to 44. In 2013, an estimated 550,000 children became infected with TB, and 80,000 HIV-negative children died of TB. TB is a leading killer of HIV-positive people causing one fourth of all HIV-related deaths. Globally in 2013, an estimated 480,000 people developed multidrug-resistant TB (MDR-TB). The estimated number of people falling ill with TB each year is declining, although very slowly, which means that the world was in the right direction to achieve the Millennium Development Goal (MDG) in reversing the spread of TB by 2015. However, the deadline for the achievement of MDG for TB had passed and was not achieved. Sustainable Development Goals (SDG) were set after the expiration of MDG. With current practice in Nigeria, the hope for the actualization of SDG is still slim. The TB death rate dropped by 45% between 1990 and 2013. An estimated 37 million lives were saved through TB diagnosis and treatment between 2000 and 2013 (WHO, 2014c). However, available data showed Africa, and Nigeria in particular, have not managed to achieve the Millennium Development Goal for TB in 2015. According to WHO's 2014 TB report, Nigeria is among the six countries with the highest incidence of TB (WHO, 2014a, 2014d).

Knowledge of TB was shown to correlate with a positive attitude and better preventive practices towards the disease (Hoa, Chuc, & Thorson, 2009). However, knowledge alone may not lead to attitudinal change (Rondags, Himawan, Metsemakers, & Kristina, 2014). Therefore, TB patients should have both adequate knowledge of TB and motivation, which will enable them to take preventive measures against the disease by having a positive attitude towards the disease. A positive attitude may help reduce stigma and encourage the patients to seek medical treatment and adhere to it. However, knowledge of the disease was shown to be low among different populations including Africa (Akin et al., 2011; Gonzalez-Angulo et al., 2013; Hoa et al., 2009; A. D. Jackson, McMenamin, Brewster, Ahmed, & Reid, 2008; Vandan, Ali, Prasad, & Kuroiwa, 2009). West African studies including Nigeria were reporting the least level of knowledge of the disease. The lack of awareness may lead to subsequent exposures resulting in a continuous cycle of infection with the disease. This vicious cycle will continue if there are inadequate knowledge, attitude, and practice regarding the disease.

TB is a very common disease, and everybody is at risk of getting the disease. However, some factors can make an individual more predisposed to acquiring the disease. Malnourished individuals, persons with HIV, diabetes or any immunosuppressive condition are more predisposed to developing the disease compared with normal healthy persons (WHO, 2014c).

Researchers explored different interventions (health education, counseling, training, and workshop) among TB patients, in an attempt to help improve their knowledge, attitude, practice or treatment outcomes. The interventions gave varying degrees of success (Dick & Lombard, 1997; Hoa, Diwan, & Thorson, 2005; Liefoghe, Suetens, Meulemans, Moran, & Muynck, 1999; Wu, Chou, Chang, Sun, & Kuo, 2009). However, in 2011 photovoice method was used for the first time among newly diagnosed TB patients to assess treatment outcome (Shelke et al., 2014). It was a quasi-experimental study conducted among TB patients in India and was shown to be promising in improving TB treatment outcome.

Photovoice is a process by which people can identify, represent and enhance their community through a specific photographic technique. It was introduced in the mid-90s and has since then been applied in different fields of study (Catalani & Minkler, 2010; Wang & Burris, 1997). It aimed to (1) to enable people to record and reflect their community's strengths and concerns, (2) to promote critical dialogue and knowledge about important issues through large and small group discussion of photographs, and (3) to reach policymakers (Catalani & Minkler, 2010). It was built based on feminist theory as a community based participatory research method. It was used among TB patients before (Shelke et al., 2014; Dick et al., 1996).

1.2 Problem Statement

Knowledge regarding TB was shown to be low in certain countries, including those in Africa (Akin et al., 2011; Gonzalez-Angulo et al., 2013; Hoa et al., 2009; A. D. Jackson et al., 2008; Vandan et al., 2009). Nigeria reported inadequate knowledge of causes, symptoms, treatment, cure, and prevention of TB among the general public (Inter-gender, 2010; Tobin, Okojie, & Isah, 2013; Uchenna, Ngozi, C, Charles, & O, 2014). This lack may lead to subsequent exposures resulting in a continuous cycle of infection with the disease (Suleiman, Sahal, Sodemann, Elsony, & Aro, 2014). This vicious cycle will continue if there are inadequate knowledge, attitude, and practice regarding the disease.

In addition, studies in Nigeria showed negative attitude and poor TB related practices among the populace (Tobin et al., 2013; Uchenna et al., 2014). This finding is similar to what was demonstrated by several studies conducted in different populations around the globe showed TB patients were having negative attitude towards the disease (Hagag, Abosrea, & Eassa, 2012; J. A. Khan, Irfan, Zaki, Beg, & Hussain, 2006; M U Mushtaq et al., 2010; Yadav, Mathur, & Dixit, 2006). Attitude and practice have been shown to be related (Hashim, Kubaisy, & Dulayme, 2003). The finding of negative attitude among TB patients may affect their practices related

to the disease. The negative attitude may prevent the patient from seeking medical care; the infected person might remain in the society transmitting the disease. Good TB-related practice includes cough etiquette, sleeping in the uncrowded environment, covering sputum coughed out, among other desirable practices for the prevention of transmission. When practices are lacking, the consequence is increased transmission of the bacteria to uninfected persons (Bati, Legesse, & Medhin, 2013; Gilpin, Colombani, Hasanova, & Sirodjiddinova, 2011). To stop this transmission, attitude and practices of the populace and especially TB patients need to be improved.

Adherence to anti-TB treatment is a problem among TB patients. Many patients have been reported to have defaulted along the course of therapy. Different studies reported different adherence among the participants. It was shown that adherence to anti-TB medication was low among the participants in one study (Dick & Lombard, 1997) and suboptimal in another study (Anyaike et al., 2013) conducted in Nigeria. In Dick and Lombard study, the adherence improved following the intervention.

Adherence to TB treatment and eventual successful outcome of TB treatment was linked to knowledge of the disease among the patients (“Desk review on TB in Nigeria: executive summary,” 2010). People with better knowledge of TB have been shown to exhibit a positive attitude and better preventive practices towards the disease (Hoa et al., 2009). Therefore, TB patients should have adequate knowledge of illness, which will enable them to take preventive measures against the disease. Sound knowledge may lead to having a positive attitude towards the disease, which may help reduce stigma and encourage the patients to medical treatment and adhere to it.

Nigeria and other African countries had not made satisfactory progress in achieving the MDG for TB, which had expired and replaced with SDG. Similarly, Nigeria was reported to be among six countries with the highest burden of TB (WHO, 2014a, 2014d). The morbidity related to TB is increasing in Nigeria while it is decreasing in other parts of the world (WHO, 2014a, 2014d).

1.3 Significance of the Study

This study covers the fundamental issues of improving knowledge, attitude, practice, and TB treatment outcome among new TB patients via building their self-efficacy. There is already an existing combination of inadequate knowledge, negative attitude, and environmental influences towards adherence to TB treatment which is leading to the poor outcome of TB treatment. These issues among other things have prompted the development of this photovoice intervention. If the intervention was successful, it will improve TB treatment outcome by raising the level of knowledge and attitude of the TB patients. The improved knowledge is expected to improve the attitude and practice of the participants. The study is expected to produce a tool to motivate and educate TB patients, which if found effective can be replicated across the states and the nation as well. If insufficient knowledge is found to be a problem among TB

patients, this may trigger prompt action from governmental as well as non-governmental organizations to raise awareness about the disease among the populace in Nigeria. The increased awareness generated could empower individuals to protect and seek better care for themselves against TB. The questionnaire developed can be used by other researchers in their future studies.

1.4 Research Questions

1. What are the socio-demographic characteristics and distribution of TB patients in Sokoto?
2. What is the level of knowledge, attitude, practice, and self-efficacy regarding TB among TB patients attending Specialist Hospital Sokoto?
3. What are the predictors of knowledge, attitude, practice, and self-efficacy regarding TB in Sokoto?
4. What is the effectiveness of Photovoice method in improving knowledge, attitude, practice, self-efficacy, and treatment outcome regarding TB among patients attending Specialist Hospital Sokoto?

1.5 Objectives

1.5.1 General objective

To determine the effectiveness of photovoice method in improving TB knowledge, attitude, practice, self-efficacy, and treatment outcomes regarding TB among TB patients in Specialist Hospital Sokoto, Sokoto state Nigeria with its associated factors.

1.5.2 Specific objective

1. To identify the socio-demographic distribution, clinical, and environmental factors of TB patients in this study at baseline.
2. To determine baseline anxiety and depression levels; knowledge, attitude, practice, and self-efficacy regarding TB.
3. To determine the predictors of knowledge, attitude, practice, and self-efficacy as well as TB treatment outcome.
4. To develop, implement, and evaluate the photovoice intervention.
5. To determine the effectiveness of photovoice method in improving the TB knowledge, attitude practice, self-efficacy, and treatment outcome.
6. To determine the difference in proportions of participants with successful TB treatment outcome between the intervention and the control groups.
7. To determine the mean difference in knowledge, attitude, and practice between the intervention and the control groups.
8. To determine the mean difference in self-efficacy between the intervention and the control groups.

1.6 Research hypothesis

1. Photovoice participants have significantly higher mean knowledge, attitude, and practice scores than the control group.
2. The proportion of patients with successful treatment outcome will be significantly higher in photovoice participants compared with the control patients.
3. Photovoice participants have significantly higher mean self-efficacy scores than the control group.
4. Socio-demographic variables are significantly associated with TB knowledge, attitude, practice, self-efficacy, and TB treatment outcome.
5. Comorbidities are significantly associated with TB treatment outcome and self-efficacy.



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