

Effectiveness of the “Social Assistance and Information for TB Patients”

Project in Abovyan, Armenia: a Pilot Study

Masters of Public Health Integrating Project Utilizing Professional Publication

Framework

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Table of content

Acknowledgments	1
Executive summary	3
Background information/Literature review	5
Magnitude of the TB problem in Armenia	7
Armenian Red Cross Society Intervention	9
Research questions	11
Methods	11
Target and study population	11
Study design	12
Study instrument	13
Data collection	13
Ethical considerations	14
Data analysis	14
Results	15
Demographic characteristics	15
Socio Economic Status	15
TB knowledge	16
Adherence to TB treatment	18
Limitations of the study	19
Discussion	20
Reference list	23
Tables	26
Appendices	31

Executive summary

Tuberculosis (TB) is one of the dangerous communicable diseases in the world and is a serious health and social problem for many countries, including Armenia. By the World Health Organization (WHO) estimations, around 75 new TB cases per 100, 000 population occur every year in Armenia. Socio-economic difficulties, poverty and migration contribute to scaling up the TB epidemics in the country. Among important issues that escalate the TB epidemic are low adherence of TB patients to prescribed treatment regimen as well as low awareness of TB patients and their families of TB related topics, such as TB modes of transmission, symptoms and preventive measures.

To address treatment adherence and TB awareness related issues, Armenian Red Cross Society (ARCS) implemented the “Social assistance and information for TB patients” project from April 2006 to September 2006 in Abovyan city of Armenia. The main objectives of the project were to contribute to complete TB treatment, as well as to increase awareness of TB patients and their families on TB related issues.

The aim of this study was to assess the impact of the ARCS “Social assistance and information for TB patients” project on TB related knowledge and adherence to the prescribed treatment of the project participants. For this purpose, the project intervention group was compared with the comparison group - TB patients of Abovyan city who were not beneficiaries of the above-mentioned project. The study results showed that there was statistically significant difference in TB knowledge between the intervention and the comparison groups due to ARCS intervention. The difference in TB treatment completion between the two groups was 9.4%, which could have practical significance taking into account the magnitude of TB problem. Moreover, this study results showed that there was statistically significant association between TB treatment completion and TB related

knowledge in both study groups. This finding was consistent with previous studies that provided evidence on positive relationship between TB knowledge and treatment adherence. A significant limitation of this study was the small sample size, and consequently very low power.

The study demonstrated the importance of including social-welfare and educational components in TB control and treatment programs. Implementation of similar projects in other provinces of Armenia would contribute to uninterrupted treatment, higher TB related knowledge and subsequently better treatment outcomes.

Background information/Literature review

Tuberculosis (TB) is one of the dangerous communicable diseases in the world and is a serious health and social problem for many countries. It has killed more people than any other disease in human history (1). In spite of the fact that Robert Koch discovered the TB pathogenic agent more than 100 years ago and an effective treatment is available, TB remains a major health and social concern all over the world. The World Health Organization (WHO) estimated that one third of the world's population is currently infected with the TB bacillus and that two million deaths occur each year because of the disease (2). Worldwide, TB is the second largest contributor to adult mortality among infectious diseases (3).

TB mainly affects the most productive age group; thus the economic cost to the society is high (4). In developing countries, 75% of TB cases occur in the most economically productive age group (15-54 years) (5). On average, an adult with TB loses three to four months of work time, which often leads to impoverishment of a household (5).

To combat the disease, WHO recommends a cost-effective strategy: Directly Observed Treatment Short Course (DOTS) ensuring effective diagnosing and treatment of TB. DOTS strategy is based on directly observed treatment, which means health worker supervises patients' medication intake at a health facility or at home. The average duration of the treatment by DOTS is six to eight months. A patient has to undergo the treatment at a TB treatment facility at least for two months, which is the intensive phase of the treatment and four to six months at home, the continuous or ambulatory phase (6).

After many years of decline, TB incidence has once again started to increase worldwide (6). The main reasons for increasing TB burden are various: poverty and the increasing gap between rich and poor in some populations, inadequate case detection and treatment, poor compliance with treatment, antibiotic misuse and human immunodeficiency

virus (HIV) pandemic (5). HIV infection significantly increases the risk of developing TB. Countries with a high prevalence of HIV (e.g. sub Saharan Africa) showed two or three time increase in the number of TB cases in the 1990s (5). Multi-drug resistance, which is caused by poorly managed TB treatment and misuse of antibiotics, is a growing problem in many countries around the world (5).

One of the important factors that affect the TB epidemic worldwide is poor adherence of TB patients to prescribed treatment. Low awareness of TB patients and their family members of TB related issues, such as the modes of transmission, symptoms and preventive measures also contributes to the TB epidemic (5).

Previous studies provide evidence that knowledge of TB patients on TB modes of transmission, risk factors for TB and prevention is an important factor affecting the treatment outcome (7). Lack of knowledge about TB is contributing to poor adherence to prescribed treatment regimen. Likewise, individuals with better compliance with the treatment have higher general knowledge about TB (7). The literature shows that TB is perceived very often as a very dangerous, infectious and incurable disease. This perception has many social and health consequences: stigmatization and social isolation of TB patients and their families, which can bring to poor compliance with the prescribed treatment and adverse treatment outcome (8).

Compliance with the prescribed treatment is one of the crucial issues affecting the success of the treatment and dissemination of TB. Poor compliance with TB treatment has repeatedly been cited as one of the major obstacles in TB control (6). Noncompliance can lead to inadequate treatment, which can result in relapse, continued transmission, and development of drug resistance (5). Major problems with compliance arise during continuous or ambulatory phase of treatment when patients are not under constant supervision of medical

providers and have to visit regularly health facilities to receive their medications. Very often bad roads, remoteness from health facilities, high transportation cost combined with low commitment to the treatment and not sufficient TB awareness among TB patients and their family members are serious obstacles to successful TB treatment (5).

Johansson et al (1999) claim that treatment failure is not only attributed to patients' low adherence to treatment (e.g., in keeping appointments, taking medications, executing life-style changes), but also to the failure of physicians to comply with prescribed therapy, and socio-economic factors (6). Low compliance enhances the development of chronic TB cases with resistance to TB medications. Another factor that could possibly affect TB treatment adherence is gender. Gender differences in compliance with TB treatment have rarely been studied. However, it has been reported in the existing literature that in general women are more likely to comply with TB treatment than men (6). Ogden et al (1999) emphasize that TB control programs need to address social dimensions of TB, and adhere to the principles of comprehensive TB care, including patients' compliance with prescribed treatment regimen (9).

Magnitude of the TB problem in Armenia

During the Soviet period, TB was well controlled and did not pose much of a danger for the Armenian population. Among the main strengths of the formerly socialist health systems was the comprehensive control of communicable diseases (10). In 1970s, the number of newly detected cases (incidence) in Armenia was 25-28 per 100, 000 per year (11). After the collapse of the Soviet Union in 1991, Armenia has been undergoing social and economic transition, which along with other social and health issues brought to deterioration of the TB situation (11).

According to the official country statistics, the number of cases of active TB (prevalence) was 98.8 per 100,000 population in 1988, compared with 200.5 cases per 100,000 population in 2005 (13). Correspondingly, the incidence rate of TB in 1988 was 18.6 cases per 100,000 population and in 2005 it reached 62.3 cases per 100,000 population (13). This increase in the number of newly detected cases is partly attributed to improved case detection (14). Compared to 2002, the case detection rate in 2004 increased approximately by 11% (11).

Currently, TB is a significant public health issue in Armenia. Socio-economic difficulties, poverty and migration contributed to the scaling up of the TB epidemics in the country. The poor, who constitute about 34% of the population, in general do not seek health services because they cannot afford paying for health care (14). According to the Ministry of Social Welfare and TB hospitals data, tuberculosis affects mainly the socially insecure and vulnerable groups of population (11). Low utilization of health services, poor knowledge of the population on TB prevention issues as well as misuse of antibiotics contribute to TB spread and increased number of drug resistant forms in Armenia (11).

According to the recent Demographic and Health Survey (DHS), over 20% of women and 30% of men have never heard of TB and do not know how it is transmitted (13). Only half of the respondents (about the same as in DHS 2000) were able to identify correctly the mode of TB transmission through the air when coughing (13). About 51.0% of women and 60.7% of men knew that TB could be completely cured. Since 2000, both women and men became more aware of TB symptoms. For instance, the number of men who mentioned coughing as a symptom of TB has increased from 25% in 2000 to 52% in 2005 (13).

Armenia adopted DOTS as a national strategy to control TB in 1995 (11). Coverage for the DOTS program had reached 100% of the TB cases by the end of 2002 (13). Only

newly diagnosed patients with pulmonary TB or those having drug susceptible TB are treated with DOTS. Those who have confirmed multi-drug resistance, or chronic cases that have failed treatment by DOTS, typically should receive DOTS-Plus treatment that is much more time- and money-consuming (14). However, access to the DOTS-Plus treatment is not universal for TB patients in Armenia. Medicines Sans Frontieriers - France humanitarian agency has been treating patients with drug-resistant TB only in two districts of Yerevan since September 2005 (15). By April 2007, 47 patients with drug-resistant TB (poly-drug resistant and multi-drug resistant TB) were receiving treatment, among them 24 patients were receiving hospitalized treatment and 23 were followed via outpatient or home-based care (15).

Armenian Red Cross Society Intervention

The Armenian Red Cross Society (ARCS) had been implementing the “Social assistance and information for TB patients” project from April 2006 to September 2006 in Abovyan city of Armenia. The main goals of the project were to decrease social and psychological vulnerability of the TB patients on ambulatory phase of treatment in Abovyan city of Armenia, as well as to increase the awareness of TB patients and their family members on TB related topics such as TB prevention, compliance with the prescribed TB treatment regimen, and general hygiene.

The specific objectives of the project were:

1. To improve adherence to TB treatment and TB treatment outcomes of patients in Abovyan city of Armenia through social-welfare assistance
2. To increase awareness of TB patients and their families on TB related topics

During the project implementation period (April 2006 to September 2006), 54 TB patients on ambulatory phase of treatment received the ARCS intervention. ARCS social-welfare assistance included providing food parcels (monthly) to TB patients in Abovyan city on ambulatory phase of treatment. In addition to that, a trained social worker regularly visited TB patients at their homes, delivered food parcels, conducted short discussion on TB related topics (modes of transmission, prevention, adherence to treatment and proper hygiene) and provided them with printed information materials. If the patient was not able to come to the TB dispensary to get the medications, the social worker delivered TB medications to the patient's home and observed the medications intake. The social worker also assisted TB patients with basic housework (shopping, cleaning and bathing).

The Red Cross/Red Crescent model of enhancing TB treatment with the social assistance component was demonstrated to be successful in combating the disease, as well as playing a crucial role in overcoming stigma towards those who suffer from TB (16). A study, carried out in 2004 in the Central Asian Republics of Kazakhstan, Kyrgyzstan and Uzbekistan, showed that 93% of patients under the observation of Red Crescent social workers completed their course of treatment, compared with 80% of those who did not go through the Red Crescent Intervention. The survey also confirmed that Red Crescent educational work played a key role in motivating patients to continue the treatment (16).

The purpose of the current study was to confirm that this intervention was similarly effective in an Armenian setting. The objective of the current study was to assess the impact of the "Social assistance and information for TB patients" project implemented by the ARCS on TB knowledge and adherence to prescribed treatment of the project participants (intervention group) compared with TB patients of Abovyan city who were not beneficiaries of the above mentioned project (comparison group). This study assessed the impact through

measuring TB related knowledge on compliance with the prescribed treatment regimen and successful treatment. This was a pilot study and would give an opportunity to present the achievements of the project to other Red Cross National Societies, donors and other stakeholders.

Research questions

The following research questions were posed by the study:

1. Does the level of knowledge on TB related topics in the intervention group differ from the knowledge level of the comparison group in favor of the intervention group?
2. Is the number of patients successfully completing their course of treatment higher at least by 15% in the intervention group compared to the comparison group?
3. Is there an association between TB related knowledge and adherence to the prescribed treatment regimen both in the intervention and in the comparison groups, after controlling for education, gender and socioeconomic status (SES)?

Methods

Target and study population

The target population for this study included adult TB patients undergoing DOTS. The study population was adult TB patients of Armenia who underwent the ambulatory (home-based) phase of DOTS treatment in Abovyan Republican TB dispensary's polyclinic since April 2006.

The study population included the intervention group – all 54 adult TB patients who received ambulatory TB treatment in the Abovyan Republican TB dispensary's polyclinic and

were involved in the “Social assistance and information for TB patients” project of ARCS in Abovyan city of Armenia from April 2006 to September 2006.

The comparison group included all 52 adult TB patients who received ambulatory TB treatment in the Abovyan Republican TB dispensary’s polyclinic from October 2006 to June 2007. Therefore, the assumption was that the only difference between the Intervention and the Comparison group was the ARCS intervention.

Study design

The student investigator chose the pre-experimental static comparison group study design (17) for the survey on knowledge on TB related topics and treatment adherence.

All 54 beneficiaries of the “Social assistance and information for TB patients” project were included in the intervention group. Those TB patients of Abovyan city of Armenia, who were treated from October 2006 to June 2007, did not receive the intervention of the ARCS (52 subjects), were included in the comparison group.

Inclusion criteria for the intervention group:

- TB patients of Abovyan city of Armenia receiving ambulatory phase of treatment in the Abovyan Republican TB dispensary’s polyclinic from April 2006 to September 2006
- Beneficiaries of the “Social assistance and information for TB patients” project
- 18 years and older

Inclusion criteria for the comparison group:

- TB patients of Abovyan city of Armenia receiving ambulatory phase of treatment in the Abovyan Republican TB dispensary’s polyclinic from October 2006 to June 2007

- TB patients who were not beneficiaries of the ARCS “Social assistance and information for TB patients” project
- 18 years and older

Study instrument

The student investigator developed a structured, interviewer-administered questionnaire with the aim to explore the knowledge level of the study subjects on TB related issues and compliance with the prescribed treatment regimen (Appendices 1 and 2). The questionnaire included 23 items, grouped in the following domains: demographic data, TB related knowledge, compliance with the prescribed treatment regimen and SES. The preliminary version of the questionnaire was pre tested and minor changes were made.

The student investigator adopted several questions concerning TB knowledge (questions N 6, 7, 8) from the Armenian Demographic and Health Survey 2005 questionnaire (13). Questions N 19, 20, 21 concerning the SES of the respondent came from the Sevan Household Health Assessment questionnaire (18). The Table 1 presents the main study variables.

Data collection

The student investigator obtained contact information of the intervention group members from the list of the beneficiaries of the ARCS project. The contact information of the participants in the comparison group came from the Abovyan Republican Dispensary’s TB polyclinic. Thus, the data were collected from all adult TB patients of Abovyan city, who underwent ambulatory phase of treatment in Abovyan Republican Dispensary’s TB polyclinic

from April 2006 to June 2007 (54 patients in the intervention group and 52 patients in the comparison group). Identification numbers were assigned to each participant of the study. The student investigator conducted face-to-face interviews with the study participants at their homes. The average duration of each interview was 15 minutes. Data collection process lasted for two months (June-July 2007).

Ethical considerations

The Institutional Review Board/Committee on Human Research (IRB) of the American University of Armenia approved the study. Only the student investigator had access to the completed questionnaires and data files. The original lists of TB patients and corresponding computer files with names and contact information of the participants were destroyed after completion of data collection, entry and analysis; therefore, it would be impossible to track TB patients by their names.

The questionnaire did not contain questions on sensitive aspects of the respondents' behavior (smoking, alcohol drinking, and drug abuse) as well as questions on religion, sexual behavior or being imprisoned. The student investigator informed the study participants on the objectives of the study, voluntary participation and the contact information of the principle and student investigators (Appendices 3 and 4).

Data analysis

The student investigator entered the data using the SPSS 11 for Windows statistical software and performed descriptive statistics. The SPSS 11 program was used for data analysis addressing the first two research questions. For answering the third research question

on association between TB knowledge and full treatment, the data were imported to STATA 9 statistical software, where simple and multiple logistic regressions were performed.

Results

From 54 subjects eligible for the intervention group 48 persons completed the questionnaire (one subject refused to answer, two subjects died and three subjects changed their addresses). Thus, the success rate was 89% for the intervention group. From 52 subjects eligible for the comparison group 44 persons completed the questionnaire (five subjects refused to answer, one subject died and two subjects changed their addresses). The success rate was 85% for the comparison group. All questionnaires were completed and were used for data analysis.

Demographic characteristics

The mean age was 42 years (SD=17.0) for the intervention and 41 years (SD=18.0) for the comparison group. Table 2 presents the main demographic data, including participants' gender, education and employment distribution.

Socio Economic Status

The mean number of family members was five persons (SD=2.0) in both the intervention and the comparison groups. Table 3 summarizes information on monthly spending of TB patients' households. About 93.8% of the intervention group and 95.5% of the comparison group mentioned that their spending did not meet their and their family needs.

The student investigator developed a summary household goods score by aggregating all family goods in the house (one score for each good). The mean number of household goods in the intervention group was 4.20 (SD=1.72) and 3.96 (SD=1.95) in the comparison group. The Independent Samples T-test did not reveal statistically significant difference in the mean of the summary household goods score.

TB knowledge

The study instrument included eight questions assessing TB knowledge of TB patients. Results have shown that 91.7% of the intervention group and 59.1% of the comparison group were aware of infectious nature of tuberculosis. The Independent Samples T-test demonstrated that this difference (32.6%) was statistically significant (p-value=0.000). Overall, the difference in knowledge of TB modes of transmission was in favor of the intervention group. The difference on transmission through coughing and sneezing between the intervention and comparison groups was statistically significant (p-value=0.001). The Table 4 displays the study findings on knowledge of TB modes of transmission of the intervention and the comparison groups.

There was a difference in awareness of TB symptoms between the two groups of study participants in favor of the intervention group. The difference in mentioning coughing (35.4%) and tiredness (26.5%) as TB symptoms was significant. The Table 5 presents the study findings on awareness of TB symptoms.

Among the factors contributing to development of TB, the participants in the intervention group most frequently mentioned undernourishment (77.1%) and catching cold (75.0%). The comparison group respondents mentioned catching cold (56.8%) and humidity (43.2%) most frequently as contributing factors for TB. There were substantial difference in

mentioning catching cold (18.2%) and overstrain (10.1%) in favor of the intervention group. However, the low power (catching cold - power=0.37, overstrain - power=0.26) did not allow detecting the true difference of these findings. The only statistically significant difference between the two groups' knowledge in TB contributing factors was in undernourishment answer category (p-value=0.000). The Table 6 displays the study findings on knowledge of TB contributing factors.

The data showed that 87.5% of the intervention and 81.1% of the comparison group were aware of the fact that TB can be completely cured; the very low power (0.08) did not allow detecting if the difference of 6.4% was a true difference between the groups. Approximately 85% of the intervention group and 64% of the comparison group correctly reported that TB had to be treated during 6-8 month. Independent Samples T-test detected that the difference of 21.8% was statistically significant (p-value=0.040). Approximately 96% of the intervention group and 75% of the comparison group knew that TB treatment is free of charge in Armenia. The difference of 20.8% was not statistically significant. Around 96% of participants of the intervention group and 64% of participants of the comparison group disagreed with the statement that they could stop TB treatment without consulting their physician, if they felt better. Independent Samples T-test displayed statistically significant difference (p-value=0.000).

The student investigator generated a summary TB knowledge score to address the first research question on difference in TB knowledge between the intervention and the comparison groups. For this purpose, a new variable was created by aggregating questions 6-13 concerning TB knowledge. Each correct answer added one score to the TB knowledge summary variable. Thus, the maximum possible knowledge score was 26. Analysis showed that the mean TB knowledge score was 13.5 (SD=1.96) for the intervention group and 9.7

(SD=3.57) for the comparison group. Independent Samples T-test detected statistically significant difference (p-value=0.000) of the mean TB knowledge score between the intervention and the comparison groups.

Adherence to TB treatment

The findings of this study showed that 16.7% (n=8) of the intervention group and 27.3% (n=12) of the comparison group reported that they missed to take TB medication during the ambulatory phase of treatment. Fifty percent of the above mention eight subjects from the intervention group and 75% of the 12 subjects from the comparison group reported that they missed their treatment for less than 14 days. The other 50% of the above mention eight subjects from the intervention group and 25% of the 12 subjects form the comparison group reported that they missed the treatment for 15-30 days. Table 7 displays the reasons for treatment interruption in the intervention and comparison groups. All participants of the intervention (n=8) and comparison (n=12) groups, who missed taking the TB medications, resumed the prescribed treatment after the interruption.

The data showed that 95.8% of the intervention and 86.4% of the comparison group participants answered “yes” to the question “Did you take full course of treatment as was prescribed by your physician?”. This question was considered as a key indicator of adherence of TB patients to the prescribed treatment regimen and one of the indicators of treatment success. The Independent Samples T-test displayed that 9.4% difference between the intervention and the comparison group was not statistically significant. Calculation of the power (power=0.23, alpha=0.05) showed that it was not enough to detect the true difference in treatment completion between the two groups. Still, the assumption made in the second

research question, concerning the difference of 15% or more in completed TB treatment, was not confirmed.

Logistic regression was performed to address the third research question regarding the association between TB complete treatment and TB knowledge. According to the results of simple logistic regression there was a statistically significant relationship between the variables of TB complete treatment and TB knowledge (OR= 1.39; p-value=0.003; 95% CI (1.12-1.72)). After performing simple logistic regression, the student investigator performed multiple logistic regression by adding education, gender, summary household goods variables to the model. Because of very low number of people with higher education in both groups, the education variable was recoded in two answer categories: less than 10 years of education and more than 10 years of education. Multiple logistic regression did not reveal any statistically significant association between the control variables and TB treatment completion variable: education - OR= 1.47 (95% CI (0.10: 20.88); p-value=0.774), gender - OR= 1.35 (95% CI (0.17: 10.67); p-value=0.779), and summary household goods variable - OR= 0.84 (95% CI (0.44: 1.59); p-value=0.590). Therefore, none of the control variables added to the model and did not change the association between TB treatment completion and TB knowledge. The relationship between TB treatment completion and TB knowledge remained statistically significant (OR= 1.36; p-value=0.014; 95% CI (1.07: 1.74)). Table 8 summarizes the results of the Simple and Multiple logistic regressions.

Limitations of the study

This study has several limitations. One of the major limitations of this study was small number of participants. In some cases, the power of the study was not enough to detect a true difference between the two groups.

All subjects of the study were TB patients who underwent the ambulatory phase of treatment in Abovyan Republican TB dispensary's polyclinic. It is possible, that those patients were different from patients of other regions of Armenia by their socio-demographic characteristics, TB knowledge and adherence to the prescribed treatment regimen. Thus, the results observed in this study could not be extrapolated to TB patients from other regions of Armenia. The information on adherence to the prescribed treatment regimen was self-reported which could also be a possible source of bias.

The student investigator developed the study instrument; the instrument was pre-tested, but no reliability and validity analysis was conducted.

The other potential source of bias could be the retrospective character of the study. The interviews were conducted months after intervention of the ARCS. Therefore, the TB patients may not remember some of the relevant information concerning their TB knowledge or treatment regimen (Recall bias). Recall bias might be more evident in the intervention group members, because they underwent the TB treatment earlier than the members of the comparison group. The study participants may also underreport the interruptions of the prescribed treatment regimen as not an acceptable behavior.

Discussion

The aim of this study was to assess the effectiveness of the ARCS "Social assistance and information for TB patients" project on TB related knowledge and adherence to the prescribed treatment of the TB patients. The study results showed that there was statistically significant difference in TB knowledge between the intervention and the comparison groups. Since both groups underwent the TB treatment in Abovyan Republican dispensary and

supposedly received the same medical care, it could be assumed that the observed difference was due to the ARCS intervention.

This study demonstrated 9.4% difference in TB treatment completion between the two groups in favor of the intervention group. The positive trend of the treatment completion, as a result of the intervention, was consistent with the previous studies (16). Moreover, 9.4% difference could have practical importance, especially in the case of contagious disease treatment and control. However, the small sample size, and consequently low power did not give an opportunity to detect the true difference in treatment completion between the intervention and the comparison group.

Previous studies showed that lack of TB awareness was independently associated with treatment interruptions (19). This study demonstrated that there was strong association between TB treatment completion and TB related knowledge. However, it was possible that there were other known or unknown factors, such as concomitant diseases, mental state of the patients or interfamily relationships, affecting the TB treatment adherence that this study did not take into consideration.

Further investigations are needed to address potential biases, to provide deeper understanding of knowledge-adherence relationship, as well as reveal the effect of social-welfare assistance and TB related information on successful treatment of TB patients.

The study demonstrated the importance of including social-welfare and information components in TB control and treatment programs. The ARCS “Social assistance and information for TB patients” project also positively influenced treatment completion; more participants in the intervention group reported that they completed the prescribed treatment than in the comparison group.

Public health interventions should focus on increasing TB patients' knowledge of TB related issues ensuring complete TB treatment, both in health clinics and in the community (7). Therefore, similar projects should be conducted in all provinces of Armenia, to reach higher TB related knowledge, uninterrupted treatment, and subsequently better treatment outcomes.

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Tables

Table 1. The study variables

Variable Name	Type	Measure
Group	Independent/Dichotomous	1-Intervention 2-Comparison
Age	Independent/Continuous	≥ 18
Gender	Independent/Dichotomous	0-Male 1-Female
Education	Independent/Ordinal	0-Less than 10 year 1-More than 10 year
Employment	Independent/Nominal	1-Student 2-Employed 3-Unemployed 4-Pensioner
Summary TB knowledge score	Dependent ¹ /Continuous Independent ² /Continuous	0-26
Medication intake interruption	Dependent/Dichotomous	0-Yes 1-No
Duration of interruption	Dependent/Ordinal	1-Less than 14 days 2-15-30 days 3-31-60 days 4-more than 61 days 5-Do not remember
Treatment completion	Dependent/Dichotomous	0-No 1-Yes
Number of family members	Independent/Continuous	-
Monthly spending	Independent/Ordinal	1- Less than 25,000 dram 2-26,000-50,000 3-51,000-100,000 4-101,000-250,000
Summary household goods score	Independent/Continuous	0-11

¹ For research question #1

² For research question #3

Table 2. Demographic characteristics of the study participants

Demographic data		Group			
		Intervention group		Comparison group	
		Count	%	Count	%
Participants gender	Male	36	75.0%	34	77.3%
	Female	12	25.0%	10	22.7%
Education	Uncompleted secondary	13	27.1%	12	27.3%
	Secondary	22	45.8%	25	56.8%
	Specialized secondary	11	22.9%	6	13.6%
	Uncompleted higher	2	4.2%	–	–
	Higher/University	-	-	1	2.3%
Employment	Student	2	4.2%	1	2.3%
	Employed	11	22.9%	10	22.7%
	Unemployed	28	58.3%	26	59.1%
	Pensioner	7	14.6%	7	15.9%
Total		48	100.0%	44	100.0%

Table 3. Monthly family spending of the study participants

Monthly spending	Group code			
	Intervention group		Comparison group	
	Count	%	Count	%
Less than 25,000 dram	9	18.8%	4	9.1%
26,000-50,000	22	45.8%	22	50.0%
51,000-100,000	13	27.1%	15	34.1%
101,000-250,000	4	8.3%	3	6.8%
Total	48	100.0%	44	100.0%

Table 4. Knowledge regarding TB Transmission of the study participants

TB modes of transmission	Group				
	Intervention group		Comparison group		P-value
	Count	%	Count	%	
Through coughing and sneezing	39	81.3%	21	47.7%	0.001
Through household goods	26	54.2%	13	29.5%	0.016
Contact with TB infected person	36	75.0%	28	63.6%	0.244
Through food	10	20.8%	8	18.2%	0.752
Through sexual contact	0	0.0%	0	0.0%	
Through mosquito bite	0	0.0%	0	0.0%	
Other	1	2.1%	1	2.3%	0.951
Do not know	1	2.1%	5	11.4%	0.073

Table 5. Knowledge of TB symptoms of the study participants

TB symptom	Group code				
	Intervention group		Comparison group		P-value
	Count	%	Count	%	
Fever	43	89.6%	36	81.8%	0.296
Weight loss	16	33.3%	10	22.7%	0.262
Coughing	41	85.4%	22	50.0%	0.000
Coughing with sputum	13	27.1%	9	20.5%	0.460
Tiredness	28	58.3%	14	31.8%	0.010
Loss of appetite	12	25.0%	7	15.9%	0.284
Pain in chest	8	16.7%	9	20.5%	0.646
Sweating	13	27.1%	10	22.7%	0.633
Blood in sputum	9	18.8%	7	15.9%	0.080
Other	3	6.3%	0	0.0%	0.633
Do not know	0	0.0%	1	2.3%	0.023

Table 6. Knowledge of TB contributing factors of the study participants

TB contributing factors	Group				P-value
	Intervention group		Comparison group		
	Count	%	Count	%	
Undernourishment	37	77.1%	18	40.9%	0.000
Humidity	23	47.9%	19	43.2%	0.653
Cold habitation	16	33.3%	10	22.7%	0.262
Catching cold	36	75.0%	25	56.8%	0.067
Non-ventilated habitation	9	18.8%	5	11.4%	0.330
Overstrain	7	14.6%	2	4.5%	0.108
Stress	4	8.3%	2	4.5%	0.462
Alcoholism	3	6.3%	2	4.5%	0.721
Other	3	6.3%	4	9.1%	0.615
Do not know	0	0.0%	6	13.6%	0.008

Table 7. Reasons for treatment interruption among those who reported interrupting their treatment

Reasons for treatment interruption	Group			
	Intervention group		Comparison group	
	Count	%	Count	%
I felt sick because of drugs	2	25.0%	1	8.3%
I thought I got cured	2	25.0%	3	25.0%
I was feeling better	2	25.0%	4	33.3%
Other	2	25.0%	4	33.3%
Total	8	100.0%	12	100.0%

Table 8. Results of the Simple and Multiple logistic regressions: dependent variable - TB treatment completion

Variable	OR	SE	P-value	95%CI
Model 1				
-Knowledge score	1.39	0.1548462	0.003	1.12 - 1.73
Model 2				
-Knowledge score	1.39	0.15	0.003	1.12 - 1.72
-Education	1.54	1.47	0.649	0.24 - 9.98
Model 3				
-Knowledge score	1.38	0.16	0.005	1.11 - 1.73
-Education	1.49	1.45	0.675	0.23 - 9.99
-Gender	0.85	0.76	0.860	0.15 - 4.88
Model 4				
-Knowledge score	1.36	0.17	0.014	1.07 - 1.74
-Education	1.18	1.55	0.900	0.09 - 15.40
-Gender	0.91	0.84	0.915	0.15 - 5.54
-Household assets	0.92	0.27	0.782	0.52 - 1.65

Appendices

Appendix 1

QUESTIONNAIRE (TB)

Group code _____ Respondent ID# _____

Demographics

1. How old are you? (age) _____

2. Sex

1) Male

2) Female

3. Education

1) Uncompleted secondary 2) Secondary 3) Specialized secondary

4) Uncompleted higher 5) Higher/University

4. Employment

1) Student

2) Employed

3) Unemployed

4) Pensioner

TB knowledge

5. What was your source of information about TB? Mention all that apply (**Do not read**)

1) TB doctor or nurse

2) Other health worker

3) Red Cross social worker

4) Red Cross information materials

5) Other information materials

6) Relatives or friends

7) Mass media (TV, radio)

8) Other (specify) _____

6. Is tuberculosis an infectious disease?

1) Yes

2) No

3) Don't know

7. How does TB spread from one person to another? Mention all that apply (**Do not read**)

1) Through the air when coughing and sneezing

2) Through sharing household goods and utensils

3) Through close contact with TB infected person

4) Through food

5) Through sexual contact

6) Through mosquito bite

7) Other (specify)

8) _____
Do not know

8. What are the symptoms of TB? Mention all that apply (**Do not read**)

1) Fever

2) Weight loss

3) Coughing

4) Coughing with sputum

- 5) Tiredness/fatigue
- 6) Loss of appetite
- 7) Pain in chest
- 8) Night sweating
- 9) Blood in sputum
- 10) Other (specify) _____
- 11) Do not know

9. What factors contribute to developing TB? Mention all that apply (**Do not read**).

- 1) Undernourishment
- 2) Living in a humid places
- 3) Living in cold places
- 4) Catching cold
- 5) Non-ventilated habitation
- 6) Overstrain
- 7) Stress
- 8) Alcoholism
- 9) Other (specify) _____
- 10) Do not know

10. Can TB be cured?

- 1) Yes
- 2) No
- 3) Do not know

11. How much time on average should TB patient undergo the treatment?

- 1) 1-2 month
- 2) 2-4 month
- 3) 6-8 month
- 4) Other (specify) _____

12. Is TB treatment in Armenia free of charge?

- 1) Yes
- 2) No
- 3) Do not know

Now I will read the statement and you will say whether you agree with it or disagree.

13. I can stop the TB treatment if I feel better without consulting my physician.

- 1) Agree
- 2) Disagree
- 3) Do not know

Compliance

14. Have you ever missed to take your TB medication during “at home” (continuous) phase of treatment?

- 1) Yes
- 2) No (**go to Q 18**)
- 3) Do not remember (**go to Q 18**)

15. How many days did you miss?

- 1) Less than 14 days
- 2) 15-30 days
- 3) 31-60 days
- 4) more than 61 days
- 5) Do not remember

16. If you ever interrupted the treatment, what was the reason? Mention all that apply.

- 1) I felt sick because of drugs
- 2) Habitat change
- 3) No money for transport
- 4) I thought I got cured
- 5) I was feeling better
- 6) Other (specify) _____

17. Did you resume the treatment after interruption?

- 1) Yes
- 2) No
- 3) Do not remember

18. Did you take full course of treatment as was prescribed by your physician?

- 1) Yes
- 2) No
- 3) Do not remember

19. If yes, what was the duration of the treatment in months? _____

SES

20. Number of family members _____

21. How much money on average does your family spend in a month?

- | | |
|--------------------------|----------------------|
| 1) Less than 25 000 dram | 4) 101 000-250 00 |
| 2) 26 000-50 000 | 5) 251 000 and more |
| 3) 51 000-100 000 | 6) Refused to answer |

22. Is the monthly income enough to meet your needs and the needs of your family?

- | | | |
|--------|-------|----------------|
| 1) Yes | 2) No | 3) Do not know |
|--------|-------|----------------|

23. Do you or your family have any of the listed below household goods in your house? Mention all that apply.

- | | |
|-------------------------|-------------------------|
| 1) Indoor toilet | 8) Personal computer |
| 2) Hot water tank | 9) Cable/satellite TV |
| 3) Color television | 10) Cellular phone |
| 4) VCR | 11) Vacation home/villa |
| 5) Automobile | 12) Non of the above |
| 6) Auto washing machine | |
| 7) Telephone | |

Thank you very much for sincere answers

Appendix 2

Հարցաշար

Խմբի կողմ _____ Հարցվողի կողմ _____

Ժողովրդագրական տվյալներ

1. Քանի՞ տարեկան եք: _____

2. Սեռը

1) Արական

2) Իգական

3. Ի՞նչ կրթություն ունեք:

1) Թերի միջնակարգ

2) Միջնակարգ

3) Միջնակարգ մասնագիտական

4) Թերի բարձրագույն

5) Բարձրագույն

4. Ո՞րն է Ձեր զբաղվածությունը:

1) Ուսանող

2) Աշխատող

3) Գործազուրկ

4) Թոշակառու

Տուբերկուլոզի մասին իրազեկություն

5. Որտեղի՞ց եք ստացել տեղեկատվություն տուբերկուլոզ հիվանդության մասին? *Նշել բոլոր հնարավոր պատասխանները (Չկարդալ)*

1) Տուբերկուլոզով զբաղվող բուժաշխատողից

5) Այլ տեղեկատվական նյութերից

2) Այլ բուժ աշխատողից

6) Բարեկամներից կամ ընկերներից

3) Կարմիր Խաչի սոց. աշխատողից

7) ՁԼՄ-ներից

4) Կարմիր Խաչի

8) Ուրիշ (Նշել) _____

տեղեկատվական նյութերից

9) Չգիտեմ

6. Ի՞նչ եք կարծում, տուբերկուլոզը վարակի՞չ հիվանդություն է:

1) Այո

2) Ոչ

3) Չգիտեմ

7. Ձեր կարծիքով ինչպե՞ս է փոխանցվում տուբերկուլոզը: *Նշել բոլոր հնարավոր պատասխանները (Չկարդալ)*

1) Օդակաթիլային ճանապարհով՝ փռշտալու և հազալու ժամանակ

4) Սննդի միջոցով

2) Կենցաղային պարագաների միջոցով

5) Սեռական հարաբերության ժամանակ

3) Տուբերկուլոզով հիվանդի հետ սերտ շփման ժամանակ

6) Մոծակի խայթոցի միջոցով

7) Այլ (նշել) _____

8) Չգիտեմ

8. Ըստ Ձեզ՝ որո՞նք են տուբերկուլոզի նշանները: *Նշել բոլոր հնարավոր պատասխանները (Չկարդալ)*

1) Տենդ

7) Ցավ կրծքավանդակում

2) Քաշի կորուստ

8) Քրտնարտադրություն

3) Հազ

9) Արյունախիտում

4) Հազ խորխով

10) Այլ (նշել) _____

5) Հոգնածություն/Թուլություն

6) Ախորժակի վատացում

11) Չգիտեմ

9. Ինչ եք կարծում ո՞րոնք են տուբերկուլոզի զարգացմանը նպաստող պայմանները: *Նշել բոլոր հնարավոր պատասխանները (Չկարդալ)*

- | | |
|--------------------------------------|--|
| 1) Թերսնվածությունը | 6) Գերհոգնածությունը |
| 2) Խոնավ վայրում գտնվելը | 7) Սթրեսը |
| 3) Ցուրտ, չջեռուցվող վայրում գտնվելը | 8) Ոգելից խմիչքի չարաշահումը/ալկոհոլիզմը |
| 4) Մրսելը | 9) Այլ (նշել) |
| 5) Վատ օդափոխվող վայրում գտնվելը | 10) Չգիտեմ |

10. Ձեր կարծիքով տուբերկուլոզը բուժվո՞ղ հիվանդություն է:

- 1) Այո 2) Ոչ 3) Չգիտեմ

11. Ինչքա՞ն ժամանակ պետք է տևի տուբերկուլոզով հիվանդի բուժումը:

- 1) 1-2 ամիս
2) 2-4 ամիս
3) 6-8 ամիս
4) Ուրիշ (նշել) _____

12. Հայաստանում տուբերկուլոզի բուժումը անվճա՞ր է:

- 1) Այո 2) Ոչ 3) Չգիտեմ

Հիմա ես կկարդամ մեկ պնդում, իսկ դուք, խնդրում եմ, ասեք համաձայն եք դրա հետ, թե ոչ:

13. Ես կարող եմ ընդհատել բուժումը, առանց իմ բժշկի հետ խորհրդակցելու, երբ որ սկսեմ ինձ լավ զգալ:

- 1) Համաձայն եմ 2) Համաձայն չեմ 3) Չգիտեմ

Բուժման հետևողականություն

14. Երբևէ եղե՞լ է դեպք, երբ Դուք տանը չեք ընդունել նշանակված դեղորայքը:

- 1) Այո 2) Ոչ (անցում 18 հարցին) 3) Չեմ հիշում (անցում 18 հարցին)

15. Քանի՞ օր չեք ընդունել նշանակված դեղորայքը:

- 1) 14 օրից պակաս 2) 15 – 30 օր 3) 30-60 օր 3) Չեմ հիշում

16. Ո՞րն էր դեղորայքը չընդունելու պատճառը: *Նշել բոլոր հնարավոր պատասխանները (Չկարդալ)*

- | | |
|-----------------------------------|--------------------------------------|
| 1) Ես վատ էի տանում դեղորայքը | 4) Ինձ թվում էր, որ արդեն բուժվել եմ |
| 2) Ապրելավայրի փոփոխություն | 5) Ավելի լավ էի ինձ զգում |
| 3) Գումար չունեի տրանսպորտի համար | 6) Այլ (նշել) |

17. Ընդմիջումից հետո Դուք նորից սկսե՞լ էիք հակատուբերկուլոզային դեղորայքի ընդունումը:

- 1) Այո 2) Ոչ 3) Չեմ հիշում

18. Դուք ընդունե՞լ եք ձեր բուժող բժշկի կողմից նշանակված լրիվ բուժումը (հիվանդանոցում և տանը):

- 1) Այո 2) Ոչ 3) Չեմ հիշում

19. Եթե այո, ապա քանի ամիս էր տևել բուժումը: _____

Հարցվողի սոցիալական կարգավիճակ

20. Ներկայումս տանը բնակվող մարդկանց թիվը _____

21. Խնդրում եմ մոտավորապես նշեք, թե որքա՞ն է ծախսում Ձեր ընտանիքը միջինում մեկ ամսվա ընթացքում:

- | | |
|-----------------------|-------------------------|
| 1) մինչև 25 000 դր. | 4) 101 000-250 000 դր. |
| 2) 26 000-50 000 դր. | 5) 251 000 դրամից ավել |
| 3) 51 000-100 000 դր. | 6) Հրաժարվեց պատասխանել |

22. Այս գումարը բավական է Ձեր և Ձեր ընտանիքի կարիքները հոգալու համար:

- | | | |
|--------|-------|-----------|
| 1) Այո | 2) Ոչ | 3) Չգիտեմ |
|--------|-------|-----------|

23. Նշեք այն տնտեսական պարագաները/հարմարությունները որոնք ունեք Դուք կամ Ձեր ընտանիքը: *Նշել բոլոր հնարավոր պատասխանները:*

- 1) Զուգարան տան մեջ
- 2) Տաք ջուր
- 3) Գունավոր հեռուստացույց
- 4) Տեսամագնիտոֆոն/ԴՎԴ
- 5) Ավտոմեքենա
- 6) Ավտոմատ լվացքի մեքենա
- 7) Հեռախոս
- 8) Համակարգիչ
- 9) Արբանյակային անտեննա
- 10) Բջջային հեռախոս
- 11) Ամառանոց/դաչա
- 12) Թվարկվածներից ոչ մեկը

Շնորհակալ եմ անկեղծ պատասխանների համար

Appendix 3

Consent form

Project: Assessing the effectiveness of the “Social support for TB patients” project conducted by the Armenian Red Cross Society in Abovyan city of Armenia concerning treatment compliance and TB knowledge

PURPOSE OF STUDY: Hi, My name is Karine Kentenyants and I am a student of Master of Public Health Program of American University of Armenia. Conducting this study is a part of my course requirements. With this study, I am going to investigate the impact of the “Social support for TB patients” project conducted by Armenian Red Cross in Abovyan city of Armenia from April 2006 to September 2006. Assessing the effectiveness of the “Social support and information for TB patients” project will strengthen the understanding of health education needs of the TB patients and reveal impact of TB related knowledge on compliance to the prescribed treatment regimen.

PROCEDURES: It will take only 15-20 minutes from your time to complete the questionnaire. The questionnaire will be completed only once. The questions will be concerning your knowledge on TB related topics and compliance to the prescribed treatment regimen. There are no questions tackling sensitive issues (smoking, alcohol drinking, illicit drug using or being imprisoned). However, you are free not to answer if the particular question seems to you sensitive or not appropriate.

BENEFITS: Your participation is highly valuable for the study. You are not going to benefit directly from the participation, but your contribution will help to enhance Armenian Red Cross projects and other participants of the future projects will benefit, including TB patients.

CONFIDENTIALITY: The survey is confidential. Only the researcher will have an access to the obtained information. The results of the study will be generalized and your personal data will never be publicly disclosed during reporting the results of the study. The filled questionnaires and data files will be maintained and accessed only by the student investigator. Each participant will be assigned ID number. The files with personal information of the participants will be destroyed after the study.

VOLUNTARINESS: Your participation in the study is voluntarily. You have right not to participate in the study. If you agree to participate and particular questions seem to you sensitive or not appropriate, you are free not to answer it. Moreover, you are free to stop interview at any time and it will not have any negative consequences for you.

WHOM TO CONTACT: Do not hesitate to contact me, if you have any questions about this study. You can contact me at the following telephone numbers (work: 53-64-12, cell: 091-58-18-47) or by e-mail: k_karina75@yahoo.com. If you think that your questions have not been fully addressed or you have not been treated fairly, you may contact Dr. Varduhi Petrosyan at the American University of Armenia at (374 1) 51 25 65 or the Chair of the Departmental IRB Dr. Yelena Amirkhanyan at (374 1) 51 25 68.

Date _____

Appendix 4

Համաձայնության ձև

Ծրագիր՝ Հայկական Կարմիր Խաչի ընկերության Աբովյան քաղաքում իրականացված “Սոցիալական աջակցություն տուբերկուլոզով հիվանդներին” ծրագրի գնահատում տուբերկուլոզով հիվանդների իրազեկության և բուժման անընդհատության վերաբերյալ

Հետազոտության նպատակը՝

Բարև Ձեզ, իմ անունն է Կարինե Կենտենյանց: Ես Հայաստանի ամերիկյան համալսարանի (ՀԱՀ) Հանրային առողջապահության (ՀԱ) ծրագրի ուսանող եմ: Այս հետազոտությունը իմ ուսումնական ծրագրի կարևոր մասն է: Այս հետազոտության նպատակն է բացահայտել Կարմիր Խաչի կողմից 2006 թ. ապրիլ -սեպտեմբեր ամիսներին Աբովյան քաղաքում իրականացված “Սոցիալական աջակցություն տուբերկուլոզով հիվանդներին” ծրագրի արդյունքները: Վերը նշված ծրագրի գնահատումը կնպաստի տուբերկուլոզով հիվանդների կարիքների ավելի ճշգրիտ գնահատմանը և Կարմիր Խաչի ծրագրի արդյունավետության բացահայտմանը տուբերկուլոզով հիվանդների գիտելիքների և բուժմանը հետևելու վրա:

Ընթացք՝ Հարցաթերթիկի լրացման համար կպահանջվի ընդամենը 15-20 րոպե: Հարցաթերթիկը լրացվելու է միայն մեկ անգամ: Հարցերը վերաբերվում են տուբերկուլոզի գիտելիքներին և բուժման ռեժիմին: Հարցաթերթիկում չկան անձնական բնույթի (ծխախոտի, ոգելից խմիչքների, թմրանյութերի օգտագործմանը կամ բանտարկված լինելու վերաբերյալ) հարցեր: Համենայնդեպս, եթե ինչ-որ հարց Ձեզ անպատշաճ թվա, ապա այդ հարցին չպատասխանելը՝ Ձեր իրավունքն է:

Օգտակարություն՝ Ձեր մասնակցությունը շատ կարևոր է հետազոտության համար: Դուք չեք ունենա որևէ օգուտ հետազոտությունից: Բայց Ձեր մասնակցությունը կօգնի բարձրացնել Կարմիր Խաչի ծրագրերի արդյունավետությունը և օգտակար կլինի ապագա ծրագրերի շահառուներին, այդ թվում տուբերկուլոզով հիվանդներին:

Անանունություն՝ Հարցումը անանուն է լինելու: Միայն հետազոտողը կունենա տեղեկություններ Ձեր մասին: Հետազոտության արդյունքները ներկայացվելու են ընդհանրացված ձևով և Ձեզ վերաբերվող ոչ մի տեղեկություն չի ներկայացվելու արդյունքները զեկուցելու ժամանակ: Ֆայլերը, որոնք պարունակում էին մասնակիցների անձնական ինֆորմացիա, կոչնչացվեն հետազոտությունից հետո:

Կամավորություն՝ Հետազոտությունում մասնակցությունը կամավոր է: Դուք

իրավունք ունեք հրաժարվել մասնակցությունից: Եթե ինչ-որ հարց Ձեզ անպատշաճ թվա, ապա կարող եք չպատասխանել դրան: Դուք կարող եք ընդհատել հարցազրույցը, երբ ցանկանաք, դա ոչ մի հետևանքներ չի ունենա: Ում դիմել՝ Եթե Դուք ունեք ինչ-որ հարցեր հետազոտության վերաբերյալ՝ կարող եք դիմել ինձ: Իմ հեռախոսի համարներն են՝ աշխատանքային 53-64-12 և բջջային 091-58-18-47 և էլեկտրոնային փոստ՝ k_karina75@yahoo.com: Եթե դուք համարում եք, որ ձեր հարցերը բաց մնացին կամ Ձեզ հարգալից չէին վերաբերվել, ապա դուք կարող եք դիմել Վարդուհի Պետրոսյանին՝ ՀԱՀ ՀԱ դպրոցի փոխդեկանին, հեռախոս՝ 51 25 65, կամ Ելենա Ամիրխանյանին՝ Էթիկայի հարցերով կոմիտեի նախագահին, հեռախոս՝ (374 1) 51 25 68.

Ամսաթիվ _____