

Original Article

Adjustment and Completion of BASNEF Model to Provide a New Model for Educating Large Populations in Relation to Cutaneous Leishmaniasis**Hazavehei SMM¹, Heshmati H², Hasanzadeh A³, Hosseini SH⁴, Ghanbari MR⁵, Behravesh O⁶**

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Abstract

Background: Educational models that have been created for educating small populations do not have enough efficacy for educating large populations, so based on this premise and also high prevalence of Cutaneous Leishmaniasis (CL) in the Islamic Republic of Iran and lack of efficient methods for CL control, this study was designed and done with the aim of applying BASNEF model to provide a new model for educating large populations in relation to Cutaneous Leishmaniasis.

Methods: In a quasi-experimental study, 60 Volunteer Health Workers (VHWS) and 120 households that were resident in endemic areas of CL in Yazd were selected through census and multi-stage sampling method, respectively. Then, educational intervention was designed and implemented on the basis of BASNEF model. After educating VHWS based on BASNEF model, they were asked to educate households on the basis of BASNEF model. Before and after 3 months of VHWS training activities, data were collected in intervention and control groups via valid and reliable questionnaires and were analyzed with the SPSS software.

Results: The mean score of knowledge, attitude, behavioral intention, enabling factors, behaviors and influence of subjective norms after educational intervention in households in experimental were significantly increased ($P < 0.05$) while the changes in control group were not significant.

Conclusions: This educational program led to empowering of VHWS and a change in their educational behavior which in turn led to preventive measures in households under study region. It can be concluded that the new educational model presented in this research, formed based on the BASNEF model, is able to educate a large population.

Keywords: BASNEF Model, Volunteer Health Workers, Health Education, Cutaneous Leishmaniasis

Introduction

Although many studies regarding efficacy of educational models have been done, few studies have tried to educational models applicable for educating the community on a macro level. With an increasing population, new health problems, and expanding educational materials as the science progresses, educational models that have been created for educating small populations have lost their efficacy. Therefore, we should design an applicable model for educating a large population [1].

Leishmaniasis is endemic in 88 countries and 350 million people in world are at risk. An estimated 14 million people are infected and each year about 2 million new cases occur out of which 1.5 million cases are Cutaneous Leishmaniasis [2].

According to a World Health Organization report, the disease is one of 6 important parasitic diseases in tropical areas [2] and the frequency of the disease, unlike other infectious diseases, is increasing [3], mainly due to immigration, displacement of population, HIV coinfection, global warming, and changes in human ecology [2, 4]. Long-term wounds, ugly scar formation, possibility of secondary infections, heavy medical costs for society, long treatment during, and complications related to drugs have caused many problems [5, 6]. If the disease is untreated, it takes longer (about 5 months to 2 years) to recuperate during which infection transmission possibility is high [7]. The disease exists in a number of Eastern Mediterranean countries such as Afghanistan, Iran, Iraq, Saudi Arabia, Pakistan, Syria, Jordan, and Sudan [8]. Iran is one of the Eastern Mediterranean region countries with high CL prevalence (30,000 cases annually), making it among the first 7 countries in the world with CL [2, 9]. The actual statistical prevalence of the disease is 4 to 5 times higher [10]. CL is endemic in most parts of Iran and perhaps it is the most prevalent parasitic disease after Malaria. Almost always

disease is developing in new regions of Iran and a larger population gets involved [3]. According to the Ministry of Health report, the central province of Yazd is one of the most contaminated or polluted regions with CL [11].

Due to a lack of appropriate vaccines and drugs for many parasitic diseases such as CL and high prevalence of them, health education application is the top priority of the World Health Organization programs to prevent these diseases [12]. Also numerous studies have been done regarding Leishmaniasis vector control [13, 14] that has emphasized the importance of health education and community participation. Many studies have shown effectiveness and ineffectiveness of educating VHWS on increasing people's knowledge and performance concerning community health [15-17]. However, educational intervention in the field of designing and using the BASNEF model for educating large population has not been done. BASNEF model is one of the most complete models for problem solving in public health and its components are Beliefs, Attitudes, Subjective Norms and Enabling Factors. Our resources are limited and direct educational facilities to all people may not exist, so by using VHWS in educational programs, we can establish direct contact with people and educate them through VHWS. But it is necessary to educate VHWS so that they can in turn educate the people that live in areas that they cover. Due to the high prevalence of disease, its importance, and the VHWS important role in society, this study was designed and done for adjustment and completion of BASNEF model to provide a new model for educating large populations concerning Cutaneous Leishmaniasis.

Material and Methods

This is a quasi-experimental intervention and a prospective study. In this study, out of three health centers that were located in the most common endemic area of CL in Yazd city, two were randomly selected and divided into two experimental and control groups.

The study population included VHWS and their family of above health centers. Include criteria was VHWS and family that were not infected with the disease and were covered by the health centers and health stations and excluding criteria was lose of educational session by VHWS and lose of partnership in pre and post test by householders.

In this study, all VHWS of above health centers and their supported station that meet the study criteria (60 people) were studied (30 VHWS in experimental group and 30 VHWS in control group). Also, two households were randomly selected out of the families who were covered by each VHWS, a total of 60 families in experimental group and 60 families in control group. It should be mentioned that experimental and control groups in both VHWS and households were far from each other and there was not any relationship between them.

Data collection instrument was a questionnaire that was developed on the basis of BASNEF model and study goals and their validity and reliability were confirmed in previous study. The Cronbach's alpha-coefficient was 0.73-0.82 [18].

The questionnaire was including demographic characteristics (8 questions), knowledge (24 questions), attitude (12 questions), subjective norms (11 questions), behavioral intention (7 questions), enabling factors (8 questions), and practice (8 questions) respectively. Knowledge questions were developed as multiple choice questions, with 1 for a correct response and zero score for an incorrect one; a total score of 100 was justified. Attitude questions were developed on the basis of six point Likert scale (strongly agree, agree, somewhat agree, somewhat disagree, disagree, strongly disagree). The scores were between zero to five so that highest score and lowest score were related to the most desirable attitude and most undesirable attitude, respectively; a total score of 100 was justified. Subjective Norms questions were developed as three answer choices (yes, somewhat, no) that two, one and zero score were used for yes, somewhat and

no responses, respectively and the total score was calculated based on the percentage of each choice.

Behavioral Intention and enabling factors questions were developed as three answer choices (yes, somewhat, no) in which two, one, and zero scores were used for yes, somewhat and no responses, respectively and a total score of 100 was justified. Practice questions were developed as two answer choices (yes, no) that one and zero scores were used for yes and no responses, respectively and a total score of 100 was justified.

The participants completed the measures in baseline and in a 3-month follow-up. The questionnaires were completed by householders and illiterate householders' questionnaires were completed by researchers through interview. Before starting educational intervention, under studied population status was studied in the framework of BASNEF model through different methods such as Questionnaire, reviews of reports, documents, records were collected in health centers, Interview and environment observation that this information was used to design educational content and educational program, then educational intervention was conducted in 3 parts simultaneously:

A) VHWS Education: five 90-minute sessions was conducted for VHWS. First session for educating about disease and its vector, second session for educating disease prevention third session for educating social skills and fourth session for educating group work and partnership in planning that two final sessions was conducted to enhance the power and skill level of VHWS for group activities and to enhance their social skills, then were asked them to educate society during 3 months, 1.5 months later an educational session was conducted with the aim of investigation of VHWS problems, obstacles and questions related to their educational activities and solving their problems, obstacles and answering to their questions. It should be mentioned that all these sessions were designed on the basis of

BASNEF model framework and tried to participated VHWS in all planning circumstances and designing and they were be aware in relation to importance of BASNEF model components and were asked them to use the component in their educational activities.

B) educating influential people on VHWS such as doctors, health care workers and family: in these sessions, these persons were be aware briefly about CL importance and ways to prevent it and important role of VHWS for educating people for Disease Control and then were asked them to lead and encourage VHWS in regard to educational activities.

C) Weekly meetings with representatives of VHWS: it should be mention that before educational activities, VHWS were divided into 5 groups (six VHWS for each group) and were selected a representative for each group that during society education by VHWS (during three months), weekly sessions were conducted with VHWS representative. In these sessions were discussed about their problems and their questions were answered and their needs for educational activities

(Pamphlet, photos, posters) was provided. Also for providing enabling factor and for facilitating VHWS educational activities and facilitating preventive measures in families, coordination with organizations such as education and Emdad Committee was done. It should be mention that VHWS educated influential people of society such as teachers and local trusted people in addition to family education and VHWS asked these influential people to lead and encourage society for doing preventive measures. Also VHWS provided families' needs for facilitating preventive measures.

After 3 months of VHWS educational activities data were collected by questionnaire again and were analyzed statistically via SPSS software. For data analyzing, chi-square tests, T paired test, independent samplestest, Mann-Whitney and Wilcoxon test were used. Significant level was 0.05. In relation to ethical considerations, VHWS and households were justified at the beginning of the study that activities that researcher expect them to do, is completely voluntary and there isn't any force for doing these activities and informed consort were considered.

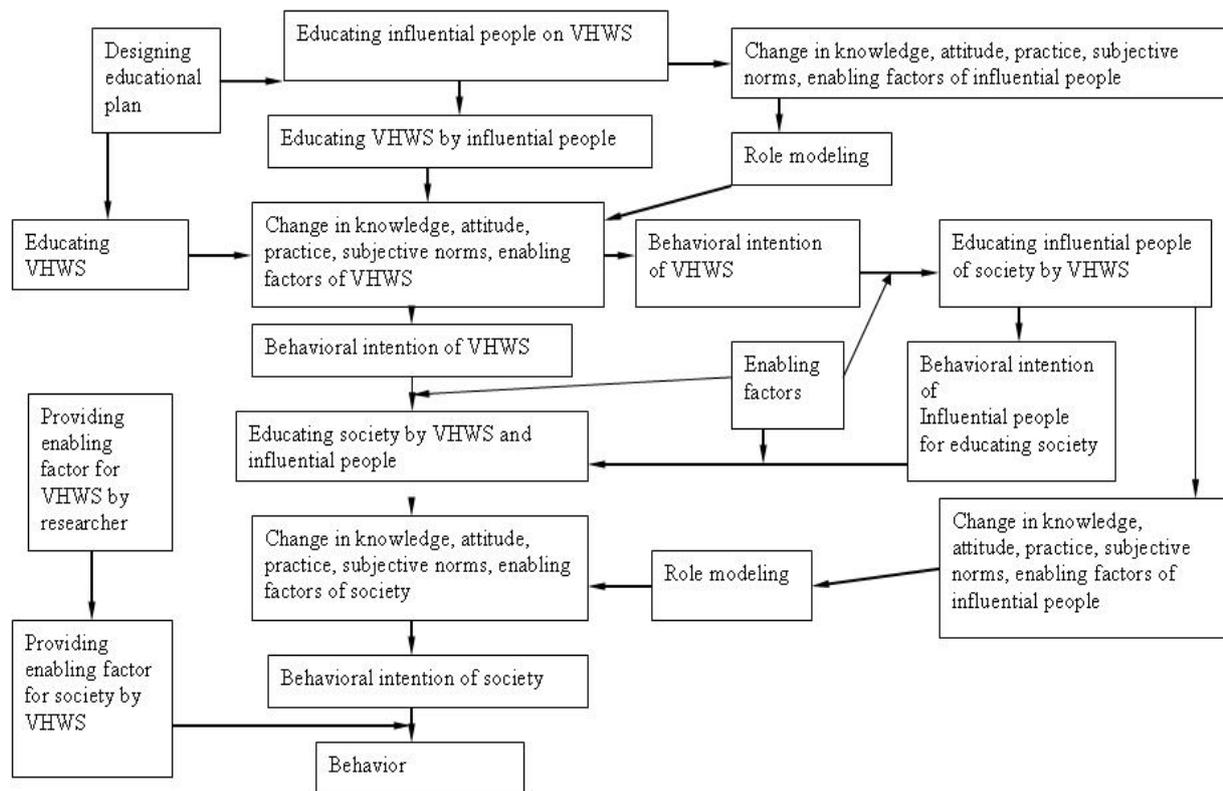


Fig. 1 Intervention Conceptual framework

Results

Independent T-test showed that age (P=425) and family dimension (P=669) of householders haven't had significant difference between experimental and control

group (Table. 1). Chi-square test showed education level (P=529) and occupation (P=168) of householders haven't had significant difference between experimental and control group (Table. 2).

Table. 1 Comparisons between mean age and family dimension of householders in experimental and control groups

Variables	N	Groups	Age(years) (Mean±SD)	t-Test	p-Value
Mean age	60	Experimental	33.73±11.50	2.06	0.425
	60	Control	35.3±10.4		
Mean of family dimension	60	Experimental	4.08±1.48	0.42	0.669
	60	Control	4.20±1.49		

Table. 2 Education and jobs of householders in experimental and control groups

Variables Groups	Control		Experimental		p-Value	
	Number	%	Number	%		
Education	Illiterate	1	1.7	1	1.7	0.529
	Elementary School	9	15	10	16.7	
	Secondary school	11	18.3	14	23.3	
	Diploma	27	45	25	41.7	
	Higher diploma	12	20	10	16.7	
Job	Employee	4	6.7	9	15	0.168
	Worker	22	36.7	22	36.7	
	Retired	17	28.3	21	35	
	self-employment	10	16.7	3	5	
	Others	7	11.7	5	8.3	

Independent T-test showed that, before educational intervention mean score of knowledge, attitude, behavioral intention, enabling factors and behavior haven't had significant difference between experimental and control groups while These variables 3 months later the educational intervention had significant differences (Table. 3). paired T-test showed that mean score of knowledge, attitude, behavioral intention, enabling factors and behavior in the experimental group significantly increased 3 months after the educational intervention while mean score of knowledge, attitude, behavior intention, enabling factors and behavior hadn't significant increase in the control group (Table. 3). Mann-Whitney Utest showed that, before educational intervention, effect of spouse, father, mother, children, neighbors, friends, local trusted people, local therapist, local spirituals, VHWS and Health workers

on householders were not significant difference between experimental and control groups. Also Mann-Whitney test showed effect of wife, mother, local therapist, local mullah, VHWS and Health workers on households had significant difference 3 months after educational intervention between experimental and control groups (P <0.05) and effect of neighbors, friends and local trusted people on householders was not significantly different between experimental and control groups (Table. 4).

Wilcoxon test with comparing before and 3 months after the educational intervention showed effect of spouse, father, mother, children, local trusted people, local spirituals, VHWS and physician on householders had significant changes in experimental group (P <0.05) and effect of neighbors, friends and local therapist on householders haven't had significant changes in the experimental group.

This test also showed that influential people changes (Table. 4).
in control group haven't had significant

Table. 3 compression of mean score of knowledge, attitude, behavioral intention, enabling factors and practice of householders before and after educational intervention in experimental and control groups.

Variables and tests	Groups	Before intervention		After intervention		T Paired test
		Mean	SD	Mean	SD	
Knowledge	experimental	40	11.21	48.20	11.32	P<0.001
	control	42.06	9.47	43.11	8.97	P=0.074
Independent t-test		P=0.278		P=0.008		
Attitude	experimental	68.19	15.11	74.51	12.06	P=0.000
	control	66.91	13.51	67.65	14.19	P=0.068
Independent t-test		P=0.626		P=0.006		
Behavioral intention	experimental	75.23	15.30	83.86	7.97	P<0.001
	control	78.21	14.49	79.29	14.26	P=0.309
Independent t-test		P=0.276		P=0.035		
Enabling factors	experimental	31.39	18.66	39.97	11.64	P<0.001
	control	36.66	21.17	34.32	16.79	P=0.246
Independent t-test		P=0.201		P=0.037		
Behavior	experimental	50.83	15.92	64.43	13.20	P<0.001
	control	55.20	17.26	56.99	14.17	P=0.350
Independent t-test		P=0.152		P=0.004		

Table. 4 Comparison of the distribution of householder's subjective norms before and 3 months after the intervention case and control groups

Subjective norms	Group	Before intervention			3 months after intervention			P-Value
		Yes (%)	Somewhat (%)	No (%)	Yes (%)	Somewhat (%)	No (%)	
spouse	Case	61.7	15	23.3	79.3	17.2	3.4	0.001
	Control	55	25	20	59.3	22	18.6	0.415
		P=0.682			P=0.010			
Father	Case	38.3	33.3	28.3	43.3	36.2	15.5	0.005
	Control	43.3	26.7	30	42.4	30.5	27.1	0.796
		P=0.797			P=0.269			
Mother	Case	50	28.3	21.7	69	27.6	3.4	0.001
	Control	58.3	21.7	20	47.5	33.9	18.6	0.109
		P=0.442			P=0.007			
Children	Case	25	21.7	53.3	51.7	34.5	13.8	0.001
	Control	36.7	28.3	35	40.7	25.4	33.9	0.559
		P=0.052			P=0.053			
Neighbors	Case	21.7	36.7	41.7	27.6	36.2	36.2	0.185
	Control	31.7	41.7	26.7	37.3	40.7	22	0.083
		P=0.077			P <0.103			

Table. 5 continuance. Comparison of the distribution of householder's subjective norms before and 3 months after the intervention case and control groups

Subjective norms	Group	Before intervention			3 months after intervention			P-Value
		Yes (%)	Somewhat (%)	No (%)	Yes (%)	Somewhat (%)	No (%)	
Friends	Case	23.3	41.7	35	34.5	31	34.5	0.224
	Control	36.7	33.3	30	39	37.3	23.7	0.285
		P=0.210			P=0.322			
Local trusted people	Case	31.7	21.7	46.7	43.1	34.5	22.4	0.005
	Control	36.7	25	38.3	33.9	28.8	37.3	0.763
		P=0.397			P=0.122			
Local Therapist	Case	31.7	26.7	41.7	19	44.8	36.2	0.360
	Control	36.7	25	28.3	47.5	23.7	28.8	0.837
		P=0.072			P=0.017			
Local spiritual	Case	21.7	21.7	56.7	39.7	39.7	20.7	0.001
	Control	25	23.3	51.7	16.9	37.3	45.8	0.617
		P=0.575			P=0.001			
VHWS	Case	60	21.7	18.3	87.9	12.1	-	0.001
	Control	61.7	30	8.3	59.3	30.5	10.2	0.544
		P=0.560			P=0.001			
Health workers	Case	58.3	15	26.7	82.8	17.2	-	0.001
	Control	63.3	28.3	8.3	62.7	25.4	11.9	0.552
		P=0.008			P=0.220			

Discussion

Two groups (experimental and control) were similar and homogeneous demographically. Also mean score of knowledge, attitude, behavioral intention, enabling factors and behavior weren't significantly different between experimental and control group. Also influential people in this study (spouse, father, mother, children, neighbors, friends, local trusted people, local therapists, local mullah, VHWS and health workers) hadn't significant difference between experimental and control groups. This indicates that control and experimental groups were selected properly and represents that there are at least confounders in this study.

Mean score of knowledge, attitude, behavioral intention, enabling factors and behavior significantly increased in experimental groups after the educational intervention while these variables have not increased significantly in control group.

The effect of spouse, father, mother, children, local trusted people, local mullah, VHWS and physician on families have had significant changes after the educational intervention in the experimental group and effect of neighbors, friends and local therapists on families haven't had significant changes in experimental group. So we should use another ways and educational methods for changing subjective pressure of neighbors, friends and local therapists on families.

In this section first, we investigate studies that found educating VHWS isn't effective on families' health promotion and awareness and then investigate studies that found educating VHWS is effective on families' health promotion and awareness.

A) studies that found educating VHWS is ineffective on families health promotion and awareness: Hagh panah in his study educated 28 VHWS in CL prevention methods and asked them to educate women that were their under covered and concluded that educating VHWS doesn't have significant changes in

awareness of these women [16]. Also vatankhah in his study investigated impact of educating VHWS on mother's awareness about respiratory infections and concluded that educating VHWS has had little effect on increasing awareness of mothers [19]. The findings of these studies in contrast with our study findings that its causes are considered in following:

As we observed, these studies have emphasized on knowledge only while knowledge is one of the required factors for VHWS for educating families.

Another important factor in education should be considered is attitude. Attitude is negative or positive assessment in person for performing a behavior or not. In the present study, VHWS attitudes about CL, ways of prevention and society education were investigated and these attitudes were strengthened for performing appropriate behaviors.

Subjective norms (influential people) are other important factors for doing or not doing appropriate behaviors in society. These influential people ask individual to do or not do behavior so behavior is affected by these people. Influential people in present study were identified and their authorities were used for creating desired behavior (society education) in VHWS. Also VHWS used influential people for their educational activities that led to their significant success in society education.

The other factors that weren't investigated in mentioned studies are behavioral intention. Sometimes Health Educators educate VHWS but understand that VHWS haven't educated society and they may blame VHWS while perhaps VHWS have been intended to educate people, but hasn't been able to educate people due to lack of social skills, educational pamphlet, booklet and enough time that all these factors are enabling factors. Social skills of VHWS in our study were not in desirable level so it was necessary to promote VHWS social skills before any action for using their abilities for society

education and promoting people health. It should be mentioned that social skills education and educating of using influential people to VHWS, provided a system so that every information were educated to VHWS will be published in society easily.

Other enabling factor that considered about it in this study is time which this factor is considered from two aspects: First, Don't having enough time for classes so times of all educational sessions were determined by VHWS.

Second, don't having time for familie's education: VHWS like other people have a lot of work to do because they are housewife and employment so they don't have enough time to educate people. Fortunately, subjective norms are one of the important components of BASNEF model that VHWS used these abilities of influential people for educating society and educated their under coverage families with spending least time.

Appropriate pamphlet for targeted groups is another enabling factor because possibility of forgetting information is high with one time education therefore we can provide educational information for VHWS summarily through pamphlet so they can read this information and learn very well so that were made them able for educating society.

B) Studies that found educating VHWS is effective on families' health promotion and awareness: Salehi in his study with educating VHWS in mental health found that educating VHWS increase knowledge and attitude of families [20] that the findings are consistent with our findings.

Nan Bakhsh in his study with educating VHWS in health pregnancy, children health cares and family planning found that educating VHWS increase knowledge of families but behaviors of families weren't different significantly between experimental and control groups after intervention [21]. increasing knowledge of families in this study is consistent with our findings but framework of Nan Bakhsh study isn't clear so we don't know which model or theories was used in his

study therefore we aren't able to investigate causes of failure in changing behavior.

An important and significant point in our study was increasing disease detection after starting VHWS educational activities, according to report of Health Center that it can be one of reason of VHWS activities affect.

Other factors that indicate VHWS desirable activities in community education were increasing supply and purchase of mosquito net. Also requests of VHWS for having Pamphlet and posters were other signs of their activities as well as asking new questions, expressing specific problems and indicating number of families that hadn't financial ability to provide mosquito nets and showed VHWS activities were successful.

In conclusion, our findings showed that educational intervention based on BASNEF model had significant effect on all aspects of behavior such as creating behavior, changing behavior, sustaining behavior in householders and BASNEF model because of having

component such attitudes, subjective norms and enabling factor increased efficacy of education and led to changing in VHWS behavior and promoting their skills that finally VHWS behavioral changes led to changes in knowledge, attitudes, subjective norms, behavioral intention and behavior in families. Finally we conclude that educational program on the basis of BASNEF model is useful for VHWS and facilitate their tasks in related to society education so we recommended for society education, educating VHWS via BANEF model and enabling them for society education is an appropriate intervention.

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