

ORIGINAL ARTICLE

An Investigation of the Effect of Retraining Courses on the Knowledge, Attitude and Performance of Health Workers in the Field of Malaria

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ABSTRACT

Background: Malaria is considered one of the most important parasitic diseases in Iran. With regard to malaria, Sistan and Baluchestan province ranks first among the country's provinces.

Aim: To investigate the impact of education on malaria knowledge, attitude and behavior among health workers working in Saravan city health center.

Methods: The present study is a semi-experimental study of before and after clinical trial type that was performed on 73 health workers in Saravan city. A researcher-made questionnaire was used to collect the required data. It consisted of two parts: the first part was dedicated to demographic data and the second part was about the knowledge, attitude and performance of health workers regarding malaria. The face and content validity of the questionnaire was confirmed by an expert panel. The reliability of the questionnaire was calculated using Cronbach's alpha coefficient ($\alpha=0.85$). Before the start of the training, the questionnaires were given to the health workers. The trainings were presented in 49 one-hour sessions by the experts of the headquarters of Saravan Health Center in Behvarzi Center using lectures and pamphlets. One month after the training, the same questionnaires were filled in by health workers.

Results: The results showed that the mean scores of health workers in the areas of knowledge, attitude and performance increased significantly after the workshop ($p=0.001$) so that the participants' knowledge score increased from 26.06 to 56.7. In terms of attitude, their score increased from 7.2 to 17.7, and in terms of performance, participants' score increased from 13 to 32.

Conclusions: The findings revealed that the implementation of educational programs in the field of malaria can increase the level of knowledge, attitude and performance of the community regarding the preventive behaviors of malaria. Therefore, health system officials are recommended to work toward the amelioration of the knowledge, attitude and performance of the health workers.

Keywords: knowledge, attitude, performance, health workers, malaria, retrainin

INTRODUCTION

Malaria is an acute and chronic infection characterized by chills, fever, anemia, and sometimes severe and fatal complications¹. The factors contributing to malaria transmission include the plasmodium parasite, the Anopheles mosquito, the carrier of the disease, and the host conditions. Both parasites and vectors are affected by temperature and the amount of rainfall and humidity². Iran is located in the south of the temperate region of the north and east of the Mediterranean with a diverse climate in the endemic region of the world map of malaria. Malaria is an endemic diseases of Iran which has been widespread in the country since ancient times and has so far brought a lot of deaths and economic and social losses³.

In Iran, the provinces of Sistan and Baluchestan, Hormozgan, as well as the south tropical regions of Kerman are considered endemic areas. Due to its proximity to the Republics of Armenia and Azerbaijan and the lack of regular malaria control programs in those countries, the border areas of northwestern Iran are always raised as the center of Plasmodium vivax. However, the total population in the malaria-prone areas of southeastern Iran is about 6% of the country's population, while more than 75% of malaria cases occur in the same areas. 80% of malaria cases in

Sistan and Baluchestan province are reported from the southern cities of Iranshahr, Nikshahr and Chabahar. In the last two decades, 2 to 3 million malaria cases have occurred annually in Afghanistan due to the civil war in Afghanistan and the lack of a regular malaria control program⁵. Fortunately, with the resumption of malaria control programs in Afghanistan and the voluntary return of Afghan refugees since 2000, malaria cases have declined significantly⁶. In Iran, malaria cases have been declining in recent years. It is believed that the declining trend in malaria cases is not only due to the proper implementation of malaria control programs and economic and social development in malaria-prone areas, but also the unprecedented drought of the past decade and the return of Afghan refugees⁷.

According to the Ministry of Health, malaria reduces the rate of economic growth by 1.3% per year⁸⁻¹⁰. Also, according to the statistics of the Ministry of Health, our country has not been immune to the disease¹¹. According to the World Health Organization, the global strategy for malaria elimination is very different from country to country and from region to region and even among different groups in society, and to succeed, these efforts must be commensurate. Whatever the situation, the goals of this strategy are to reduce the number of deaths due to illness,

reduce the suffering and the social and economic damage caused by it. Health workers need to be familiar with malaria and how to deal with it. Notwithstanding much progress in recent years in the diagnosis, treatment, control, and prevention of malaria, its irreparable health, economic and social deaths and injuries still remain major issues, and reports indicate that there are 225 million people with malaria and 781 deaths worldwide in 2009¹⁵.

Health education considers a set of knowledge and experiences that change people's subsequent behaviors by acquiring them and adapting to them¹⁶. Because this issue has four stages of becoming aware, believing, acting and getting used to it, so for proper planning in the field of health and prevention, it is important to consider the level of information and knowledge of people, i.e. evaluating the first stage of the process of creating health education in people¹⁷. Since most people in Iran are mediocre in terms of health literacy, it is better to follow the principles of health education more seriously¹⁸. Health workers are usually the first level of health services and the most environmentally friendly way to communicate between the people of the community and the country's health system. The health care system in Iran is classified and has regular structures with a logical hierarchy. In this system, a health worker is responsible for disease diagnosis, screening, follow-up and referral of patients from the health center to higher levels¹⁹. Providing health education and health care in all areas and attracting people's participation in health programs is one of the basic duties of health workers²⁰.

Saravan is bordered by Pakistan where there exists a very poor care system, and due to financial poverty, the principles of prevention are very poor. Due to the long border with Pakistan, the passage of foreign nationals is free every day. This has led to a wide range of malaria transmission due to these high-traffic commuters. According to the climate and weather (hot and dry), the conditions for the transmission of the disease and its prevalence in this city are provided. The knowledge, attitudes and performance of people living in malaria-prone areas can play a more effective role in planning to control and prevent malaria. Accordingly, this study was conducted in 2017 with the aim of investigating the effect of retraining courses on the knowledge, attitude and performance of health workers in the field of malaria in Saravan city in 2017.

METHODOLOGY

This descriptive study (cross-sectional) was performed on 98 health workers (health care providers in the first level of prevention) employed in health centers in Saravan city in eastern Iran from April 1, 2017 to September 20, 2017. Participants in the present study were selected using convenient sampling technique. Previous research was used to determine the sample size. Inclusion criteria were: having at least a diploma, having at least two years of work experience in a health center, having a work experience with patients with malaria, whereas the exclusion criteria were lack of consent to participate in the study.

In order to collect data, a questionnaire was distributed among employed health workers. In order to distribute the questionnaire among the health workers, a coordination meeting was held with the head of Saravan

Health Center. It was decided to invite experts from 13 health service centers under the auspices of the conference center. An invitation was sent to the experts in charge of the centers with the signature of the head of the health center. In connection with the coordination meeting, which was held in the presence of the head of the city's health center, the two researchers explained the goals and importance of the research and how to distribute the questionnaire and collect them. Then, 13 sessions were held among the centers by the experts under the supervision of the researchers in connection with the research and the questionnaire. The questionnaires were then delivered to the center's experts in the number of health workers covered by each health service center. The questionnaires were distributed by the experts of each center among the health workers. The questionnaire completed by the health workers was handed over to the center's staff for collection. Of the 98 distributed questionnaires, 73 were submitted to the center's experts. In addition, in order for the health workers to be more careful in completing the questionnaires, the experts gave a brief explanation about the purpose of the study. The questionnaires were then distributed to the participants at the onset of the training and at the outset the end of the training as well. Each participant was given 20 minutes to complete the questionnaires. After the questionnaires were filled in, the researcher collected them.

The instrument used was a researcher-made questionnaire encompassing four sections: demographic characteristics, knowledge, attitude, and performance about malaria. In this study, a researcher-made questionnaire was used to collect the required data. The questionnaire had four sections: the first section included items related to demographic characteristics (academic degree, work experience, marriage, gender, employment status, and age), and the second section included knowledge with 18 close items At a scale of 5 degrees, weak (1), medium (2), good (3), excellent (4) and no answer (0). The third section included a 10 close items, with a 5-point scale from weak (1), medium (2), good (3), excellent (4), and no answer (0). The fourth section consisted of performance with 10 close items, with a poor 5-point scale from weak (1), medium (2), good (3), excellent (4), to no answer (0). To determine the ratio of content validity and content validity index, the tool was given to 10 experts (8 people fighting disease and 2 health education experts) of Saravan Health Center that after collecting and applying their opinions, and those of the Advisor and Supervisor, necessary modifications were made. The content validity index was 92%. Cronbach's alpha test was used to determine the reliability of the questionnaire. Cronbach's alpha coefficient for this questionnaire was 81%.

Data analysis is presented at both descriptive and inferential levels. At the descriptive level, indicators such as tables and graphs of frequency distribution, and at the inferential level, if the data distribution was normal, one-sample t-test and the paired t-test were used. Otherwise, non-parametric equivalents i.e. binomial and Wilcoxon tests were used to examine the research hypotheses and questions. The frequency distribution of sample individuals in terms of demographic variables including job title, age, work experience, gender and marital status is presented in

the form of table and frequency diagram. One-sample and paired sample t-tests or non-parametric equivalents i.e. binomial and Wilcoxon tests were used. The collected data were analyzed using SPSS version 18.

Demographic characteristics of participants: The results showed that most participants were in the age group of 30 to 40 years old (38.4%), men (58.9%), had a diploma degree (31.5%), and were married (91.8%) (Table 1).

Table 1: Demographic characteristics of the participants

Variables		N(%)
Age	20-30	11(15.1%)
	30-40	28 (38.4%)
	40-50	19(26%)
	50-60	13(17.8%)
	More 60	2(2.7%)
Gender	Male	43(58.9%)
	Female	30(41.1%)
Level of education	Primary school	2(2.7%)
	Guidance school	3(4.1%)
	Under diploma	26(35.6%)
	Diploma	23(31.5%)
	Associate's degree	15(20.55)
	Bachelor	4(5.5%)
Marital status	Single	0
	Married	67(91.8%)
	Divorced	6(8.2%)

Main results: The results of the study showed that retraining courses had a significant effect on increasing knowledge, attitude and improving the performance of health workers ($p = 0.001$).

	Before education Mean	After education	P value
Knowledge	26.05±1.5	56.7±3.4	0.001
Attitude	7.12±1.1	17.7±2.4	0.001
Practice	13.3±1.4	32.05±2.9	0.001

DISCUSSION

This study was based on the relationship between the level of knowledge, attitude and performance of health care workers under the auspices of Saravan Health Center in relation to ways to prevent malaria before and after training. The first hypothesis of the study examined the relationship between the levels of knowledge of health workers about ways to prevent malaria before retraining. The result of the test showed that the difference of the mean knowledge score of health workers before retraining and after retraining was significant and the experimental mean score was lower than the expected mean. Therefore, the knowledge of health workers before retraining was less than medium. The results are in line with those by Mirsadraei et al., who conducted a study on the level of knowledge, attitude and performance in the field of malaria prevention in the southern regions of Tehran and Qom²¹. It is also consistent with the results of the study by Mr. Jadgal et al. who conducted a study on the impact of education on the knowledge, attitude and performance of rural men on malaria prevention in Chabahar²². The second hypothesis of the study scrutinized the relationship between the attitude of health workers towards malaria prevention

methods before and after retraining and the test showed that the mean score of the attitude of health workers was significant and the experimental mean score was lower than expected in the way that their attitude before retraining was below moderate. The results of this hypothesis are consistent with the results of a study by Mr. Malekzadeh et al. on the effectiveness of educational interventions in health workers on malaria prevention at Babol Health Center²³. The third hypothesis scrutinized the relationship between the performance of health workers and malaria prevention before and after intervention and the results of the test revealed that the mean performance score of the health workers was significant and the experimental mean was lower than the expected mean, so that the performance of the health workers before retraining was below the mean. Usually, people start a larger number of health habits when they notice the presence of specific and serious health problems²⁴. The results of this hypothesis are consistent with the results of a study by Mr. Baghalnejad et al. on the knowledge, perception and performance in Balochistan on the prevention of malaria²⁵. The most important limitations of the present study were: one of the limitations of this research was the long distance between health centers and the health and treatment center and the long distance of comprehensive health service centers to the city's health center. This limitation was eliminated by providing vehicles to experts and researchers. Another limitation was the unwillingness of the health workers to fill in the questionnaire. This problem was solved with the cooperation and sufficient explanations of experts and physicians of health service centers

CONCLUSION

According to the results of the present study, which showed the positive effect of training courses on the knowledge, attitudes and performance, it is recommended that training courses be held periodically with rich content to improve their performance.

Ethical considerations: The research has extracted of a MSc student thesis of Kerman University of Medical Sciences, Kerman, Iran. The present research has been registered in the ethics committee of Kerman University of Medical Sciences and approved by Deputy of Research and Technology affiliated to Kerman University of Medical Sciences.

The authors are thankful of all staff and authorities due warmly collaborations. Participants were fully informed about the research, duration of the study, confidentiality, and anonymity of the questionnaire, and voluntary participation in the study. Informed written consent was obtained from the participants. At all process of research, the subjects' privacy has been kept.

REFERENCES

1. Piroozi B, Moradi G, Safari H, Faraji L, Sima S, Alinia C, et al. Incidence, Mortality, and Burden of Malaria and Its Geographical Distribution in Iran during 2002-2015. *Iranian Journal of Public Health*. 2019;48:53-61.
2. Zaw MT, Lin Z. Human Plasmodium knowlesi infections in South-East Asian countries. *Journal of Microbiology, Immunology and Infection*. 2019;52:679-84.

3. Soofi K, Khanjani N, Kamiabi F. The Challenges of the Malaria Elimination Program in the South East of Iran: A Qualitative Study. *Journal of arthropod-borne diseases*. 2019;13:94.
4. Sarma N ,Patouillard E, Cibulskis RE, Arcand J-L. The Economic Burden of Malaria: Revisiting the Evidence. *The American Journal of Tropical Medicine and Hygiene*. 2019;101:1405-15.
5. Mbacham WF, Ayong L, Guewo-Fokeng M, Makoge V. Current situation of malaria in Africa. *Malaria Control and Elimination: Springer*; 2019. p. 29-44.
6. Onyia VU, Ughasoro MD, Onwujekwe OE. The economic burden of malaria in pregnancy: a cross-sectional study. *The Journal of Maternal-Fetal & Neonatal Medicine*. 2020;33:92-5.
7. Afshar R ,Shegarfy L, Shavandi N, Sanavi S. Effects of aerobic exercise and resistance training on lipid profiles and inflammation status in patients on maintenance hemodialysis. *Indian J Nephrol*. 2010;20:185-9.
8. Lechthaler F, Matthys B, Lechthaler-Felber G, Likwela JL, Mavoko HM, Rika JM, et al. Trends in reported malaria cases and the effects of malaria control in the Democratic Republic of the Congo. *PloS one*. 2019;14.
9. Slater HC, Foy BD, Kobylinski K, Chaccour C, Watson OJ, Hellewell J, et al. Ivermectin as a novel complementary malaria control tool to reduce incidence and prevalence: a modelling study. *The Lancet Infectious Diseases*. 2020.
10. Nyataya J, Waitumbi J, Mobegi VA, Noreddin A, El Zowalaty ME. Plasmodium falciparum Histidine-Rich Protein 2 and 3 Gene Deletions and Their Implications in Malaria Control. *Diseases*. 2020;8:15.
11. Herrador Z, Fernández-Martinez B, Quesada-Cubo V, Diaz-Garcia O, Cano R, Benito A, et al. Imported cases of malaria in Spain: observational study using nationally reported statistics and surveillance data, 2002–2015. *Malaria journal*. 2019;18:230.
12. Organization WH. Country case studies on primary health care: Islamic Republic of Iran. *World Health Organization*; 2019.
13. Doshmangir L, Bazayr M, Majdzadeh R, Takian A .So near, so far: four decades of health policy reforms in Iran, achievements and challenges. *Archives of Iranian medicine*. 2019;22:592-605.
14. Amiri M, Vahedi H, Mirhoseini SR, Egtesadi AR, Khosravi A. Study of the Relationship Between Self-Efficacy, General Health and Burnout Among Iranian Health Workers. *Osong Public Health and Research Perspectives*. 2019;10:359.
15. Amiri M, Chaman R, Arabi M, Ahmadasab A, Hejazi A, Khosravi A. Factors influencing the intensity of burnout among rural health workers (Behvarz) in Northeastern Provinces of Iran. *Razi Journal of Medical Sciences*. 2016;22:116-25.
16. Liu H, Zeng H, Shen Y, Zhang F, Sharma M, Lai W, et al. Assessment tools for health literacy among the general population: a systematic review. *International journal of environmental research and public health*. 2018;15:1711.
17. Mirsadraei M, Baroogh N, Mahmoodi M, Afsharzadeh P. Assessment of Attitude and Practice of the Health workers in Selected area, south of Tehran and Guam. *Hayat*. 2000;6:54-60.
18. Jadgal K. Surveying the Impact of Malaria Related Education on Knowledge, Attitude and Behavior of Chabahar
19. Malekzadeh R. The effectiveness of educational interventions in informing the health workers of Babol Health Center about malaria. *Academic Conference on Research in the Administrative and Financial Areas of the Health System; Babol s2015*.
20. Pishkar Mofrad Z, Jahantigh M., Arbabisarjou A., Health Promotion behaviors and chronic diseases of aging in elderly people of Iranshahr, IR. *Iran.,Global Journal of Health Science*; 8(3); 2016:139-145. doi:10.5539/gjhs.v8n3p139.
21. Baghlaninezhad R, Beirumvand M, Veisi MS. Analysis of knowledge and attitudes related to parasitic infections among inhabitants of Ahvaz County, Khuzestan Province, Iran. *Acta tropica*. 2019;193:211-6