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FEATURES OF AN APPROPRIATE METHOD OF HEALTH EDUCATION DURING COMMUTES: A QUALITATIVE STUDY

Akbar Babaei Heydarabadi¹, *Ali Ramezankhani², Mohtasham Ghaffari² and Yadollah Mehrabi³

¹Department of Public Health, School of Health, Student's Research Committee, Shahid Beheshti University of Medical Sciences, Tehran, Iran

²Department of Public Health, School of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran

³Department of Epidemiology, School of Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran

*Author for Correspondence

ABSTRACT

Background: Commuting refers to regular travel between home and place of work or study. Nowadays, despite scientific advances, many people spend longer times travelling between home and work due to economic and demographic reasons. The purpose of this study was to identify the characteristics of an appropriate method of education during commutes for staff of factories in Ardakan, Iran. **Materials and Methods:** This qualitative study was carried out via Conventional Content Analysis in 2014. The population included staff of Steel mills in Ardakan. The study sample was selected using purposive sampling method. Participants included experts in health education & promotion, medical education, educational technology, philosophy of education and pedagogy as well as factory managers, workers and drivers. Inclusion criteria included having at least one year of experience in the factory for employees and managers; having at least one year of experience as a driver for a factory car for drivers; and having carried out at least three research projects on different topics in the field of education and methods of education for related experts. Data were collected using semi-structured interviews each lasting 20 to 40 minutes. Data were recorded through sound recordings and notes and were analyzed using content analysis. **Results:** In this study, 10 features were identified for choosing a method of education during commutes, including applicability in the vehicle, applicability while moving, applicability in a short time (brevity), cost effectiveness, exposure to message (accessibility), visual presentation of content, involvement of various senses (being multi-sensory), attractiveness (appeal), safety for the audience (consideration of health) and possibility of two-way communication (question and answer). **Conclusion:** Taking account of characteristics of an appropriate educational method for various situations, especially in educational interventions during commutes, is very important and can significantly increase the effectiveness of such education programs.

Keywords: Characteristics, Education Method, Commuting, Staff

INTRODUCTION

Background

Commuting refers to regular travel between home and place of work or study. The term was first used in the 1840s when daily travel by train increased in the US and gradually included other types of daily travel including those by plane, bus, transit, car, bicycles, etc. (Schwanen and Dijst, 2002). Until the 19th century, most people could arrive at workplace with less than an hour walking, but today, despite scientific advances, many people spend longer times travelling between home and work due to economic and demographic reasons. In most major cities like New York, Tokyo and London, most commuting is done via rail transport system .

In a study, average commuting time was estimated to be 11 hours per week in Germany, 12 hours per week in the US and 20 hours per week in India . Another study found that most people in Brazil had to travel 10 km to get to work every day and spend an average of 45 minutes on their way from home to work . In Australia (Queensland), the average commuting distance was 20 km and the average time spent

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for this purpose was 50 minutes . In Tehran, 12 million hours a day is wasted in traffic amounting to 360 million hours a month . Based on what was said, due to expanded urban areas and overcrowding in major cities, people spend a lot of time to get to work and they perceive the time spent on such commuting a waste of time . Factory employees are not an exception in this regard and, since in many cases, their employers prevent education programs -including those on health issues- from being implemented in the workplace, efforts in order to better utilize these enormous opportunities seem necessary.

Paying attention to teaching methods and learning styles is among factors affecting learning and has been emphasized as a major contribution to successful education programs (Cassidy, 2004). Learning styles include cognitive, emotional and physiological behaviors that are "relatively stable indicators of how learners perceive, interact with, and respond to the learning environment" (Yamazaki, 2005; James and Gardner, 1995; Arthurs, 2007). The process of effective teaching is possible through selection of appropriate methods and use of appropriate education models . that can be achieved by recognition of the learning process, knowledge of modern methods and their implementation, knowledge of material resources and facilities, awareness of the role and functions of human resources, and analysis of learners and environment characteristics . Understanding different methods and styles of teaching can result in increased awareness about one's style and the possibility of its conscious modification as well as increased knowledge of teaching and learning. It can also help develop and improve the quality of educational programs, develop theories of teaching and learning in education , and identify factors influencing the quality of education. Such an understanding can be used in organizing learning environments, improving teacher-student interactions and modifying the way content is developed, taught and learnt . A knowledge of methods and styles of teaching can contribute to a better understanding of environmental factors and conditions and increase the effectiveness of educational interventions.

Given the importance of commuting, especially in large cities or where the distance between industrial towns and staff's place of residence is high and people have to commute wasting a significant amount of their time, there is a need to focus on this time as a great opportunity for improving public health knowledge.

Objectives

The aim of this study is to identify features of an appropriate method of health education during commutes among factory staff in Ardakan. Results can help make use of this huge time resource to improve the health knowledge of one of the most active populations in the society.

MATERIALS AND METHODS

This qualitative study was carried out via Conventional Content Analysis in 2014. The purpose was to identify the characteristics of a good method of health education during commutes. Content analysis is one of the qualitative research methods. It is a method for the "subjective interpretation of the content of text data through the systematic classification process of coding and identifying themes" and can be divided into three categories: Conventional Content Analysis, Summative Content Analysis, and Directed Content Analysis . Conventional content analysis is a method of obtaining valid and reliable results through subjective interpretation of the content of text data in order to create new knowledge and ideas, and provide facts and guidelines . It aims provide intensive and extensive description of a phenomenon, the analysis of which creates descriptive concepts and categories. Usually the purpose of forming concepts and categories is to build a model, conceptual framework, concept map, or classes and is often appropriate when the knowledge or research on the phenomenon under study is limited (Fridh *et al.*, 2009; Moretti *et al.*, 2011). A major advantage of conventional qualitative content analysis is that of obtaining information about participants directly and openly, without imposing predetermined categories or theoretical perspectives (Holdford, 2008; Graneheim and Lundman, 2004).

The population of this study included staff of steel mills in Ardakan. Using purposive sampling method, participants were invited to study. The purpose of sampling in qualitative studies is to acquire a deep understanding of the sample under investigation rather than generalizing from the sample to the population . To obtain the individuals' mental content, the sample, i.e. participants, are selected .

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Qualified and competent specialists help to obtain (basic) information and experiences. Participants included experts in health education & promotion, medical education, educational technology, philosophy of education and pedagogy as well as factory managers, workers and drivers, all working in the factories. Inclusion criteria included having at least one year of experience in the factory for employees and managers; having at least one year of experience as a driver for a factory car for drivers; and having carried out at least three research projects on different topics in the field of education and methods of education for related experts. Data saturation was considered as a criterion for sampling adequacy.

Data were collected using semi-structured interviews. In semi-structured interviews, the interviewer asks questions based on some key questions without a pre-set format and the interviewee answers in his/her own way. The interviewer asks the next question after the interviewee's answer (Joffe, 2011). The results are used for deeper identification and evaluation of the subjects' perceptions, attitudes, opinions, experiences and emotions (Kamimura *et al.*, 2012). In this study, after participants were selected, necessary arrangements were made about the interviews, and the time and place so that they are carried out in a place and time desirable for interviewees. Interviews lasted between 20 to 40 minutes. Data were recorded by taking notes and sound recording. The notes and transcripts entered the analysis phase. To ensure data accuracy, the transcripts were matched with the recordings and the mistakes were corrected. For ethical considerations, sound files were deleted after transcription.

The Interview Key Questions:

1. What are characteristics of a good method of education during commutes? What issues should be considered in developing such a method?
2. What methods can be used for education during commutes?
3. What are characteristics of commuting?
4. How is the state of people during commutes?
5. How is the state of factory workers in Ardakan during commutes?

Data Analysis

Content analysis consist of three phases of open coding, creating categories, and abstraction (Elo *et al.*, 2014). First the researchers read the interview transcripts several times to get a general understanding of the concepts therein. The next step was finding the sense of data via immersion in data so that patterns in the text can emerge. The researcher reviewed data line by line and word by word to identify and code the main concepts in each line or paragraph (Joffe, 2011; van Rooij *et al.*, 2012; Rozental *et al.*, 2015).

Reliability and Validity: Reliability and validity in qualitative research methods, which is evaluation of the rigor of data, include Credibility, Transferability, Dependability and Conformability (Thomas and Magilvy, 2011). Credibility is determined by prolong engagement with participants, use of a combined method for data collection, member checking, and peer debriefing (López *et al.*, 2012; Mayring, 2015). Results of the present study were reviewed by some participants and by the researchers to ensure correct selection of themes and their match with the participants' statements. Transferability is achieved via thick descriptions. The report should be thorough enough so that its information can be applied to other contexts. In the report phase, a full research report and some statements by participants are provided. Dependability refers to consistency of data in similar times and conditions and is similar to reliability in quantitative studies (Tong *et al.*, 2012). Dependability is determined through Audit Trial. An outside observer should be able to achieve the same results via reading the study and obtaining sufficient information on the research method. Conformability is the concept of neutrality in the study, which is determined via audit just like dependability (Elo *et al.*, 2014). In the present study, to determine the dependability and conformability, the transcripts and the selected themes were reviewed by outside observers.

RESULTS AND DISCUSSION

Results

In this qualitative study, 29 participants selected with purposive sampling were interviewed by semi-structured interviews each lasting between 20 to 40 minutes. Participants included experts in health

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education and promotion, medical education, educational technology, philosophy of education and pedagogy as well as factory managers, workers and drivers. After analyzing the data, 10 features were identified for choosing a method of education during commutes including applicability in the vehicle, applicability while moving, applicability in a short time (brevity), cost effectiveness, exposure to message (accessibility), visual presentation of content, involvement of various senses (being multi-sensory), attractiveness (appeal), safety for the audience (consideration of health) and possibility of two-way communication (question and answer). These are explained in more detail below.

1. Applicability in the Vehicle

Methods used for education during commutes should be executable within a vehicle. The equipment in a vehicle (TV, radio, recorder, etc.) can be effective in selecting the teaching method. For example, a health education and promotion expert said: "The method should be applicable in the vehicle in question. In fact, it should be practical during such trips." An educational technology expert said: "We need to take into account the conditions and facilities of the factory and its transit vehicles".

2. Applicability While Moving

The method should be applicable in a moving vehicle so that the movement cannot disrupt the process. A health education and promotion expert said: "the method used should be applicable while moving."

3. Applicability in a Short Time (Brevity)

One of the features that should be taken into account when selecting methods of teaching during commutes is that such a method should be applicable in a short duration. In fact, it should be able to teach a message completely during one commuting trip. For example, one of the experts (Ph.D. of education) said: "The program should be implemented in the shortest time possible and should not take a long time." A 29-year-old worker (Diploma of electricity) said: "If the program is long, the participants get tired and they will not welcome it."

4. Cost Effectiveness

The method selected for education should be cost-effective. Its effectiveness and results should justify its costs. For example, an education management expert said: "It is important to take into account the economic and financial requirements. The implementation costs of a method must be appropriate to such circumstances." A 55-year-old CEO said: "The educational program should not be a financial burden for the factory."

5. Exposure to Message (Accessibility)

Accessibility here means that people should be exposed to message. That is, the person inside the moving vehicle must be able to see or hear the message easily. A health education and promotion expert said: "If banners and posters are going to be used, they should be installed somewhere visible to all so that all can see it during commutes."

6. Visual Presentation of Content

A feature that can be effective in selecting the education method is the possibility to provide clear and objective content. In other words, education should be done with illustration and visual effects. An expert in health education stated: "education with illustration and display is more effective."

7. Involvement of Various Senses (being Multi-sensory)

This means that educational methods should be able to engage people's various senses to help them understand a concept or message. The more it can involve different senses, the more effective it will be. For example, an educational technology expert said: "Try both visual and auditory education." A health education expert stated: "visual and auditory media should be used."

8. Attractiveness of the Method (Appeal)

One of the features that should be taken into account in choosing a method is its attractiveness, so that it can attract the individuals' attention to the educational message and make them more motivated. A health education expert stated: "The method should be fun." A 28-year-old worker (BA) said: "The attractiveness of messages is very important so that it can draw people's attention."

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9. Safety for the Audience (Consideration of Health)

During education, the health of people involved (educators, trainees and driver of the vehicle) should not be compromised. In this regard, problems regarding their physical health (visual disturbances, headache, dizziness), mental health (anxiety, concentration problems) and social health (weakening of relationships) should be prevented. For example, a health education and promotion expert said: "The method may create noise pollution and hurt mental health." A medical education expert said: "Eye coordination during movement is important and can cause eye problems, headache, and dizziness for some people." A 54-year-old driver said "high noise level can prevent the driver from concentrating."

10. Possibility of Two-way Communication (Question and Answer)

Two-way communication is one of the features most stressed by the participants. The interaction between learners and instructors via questions and answer must be provided for during and after education. This can involve and motivate people. For example, an education management expert said: "People should be able to ask their questions and receive answers personally." A 37-year-old worker said: "there should be an opportunity for me to ask my questions."

Discussion

Today, with the fast growth in science and technology in the world, education is considered an inevitable requirement for employees of any organization and can increase the organization's productivity and competitive power . One way to increase productivity is a constant emphasis on staff education that requires identification of their needs and conditions (Khoshneshin and Khoshnoudi, 2014). Factory workers typically commute 2 times a day (morning and evening), 10 to 12 times a week, 44 to 52 times a month, 548 to 624 times a year and 16440 to 18720 times over thirty years of service. At least half of these trips can be potential learning opportunities. This study aims to identify the characteristics of a good method of education during commutes in 2014. Ten features was identified for an appropriate method of education during commutes, three most important of which are exposure to message (accessibility), attractiveness (appeal), and cost effectiveness.

"Applicability in the vehicle" is one of the features that the participants believe should be taken into account in the education method. In fact, the equipment and conditions of the vehicle is one of the effective factors in choosing a method for educating employees during commutes . Lambert stresses the provision of appropriate facilities and environment as one of the factors affecting learning (Lambert and Glacken, 2005). Hanifi emphasized the social context of education . Hadavand's study showed that facilities and conditions of the learning environment can have a great influence on the quality of education . Clarke states that the learning environment should have a good atmosphere .

"Applicability while moving" is another feature that should be considered, because the education is supposed to take place in moving vehicles. "Applicability in a short time" refers to the short duration of education. Since commute time is usually short, each message should be fully delivered on a single commute.

Today, education during travel is attracting more and more attention. Trips of any kind are considered as leisure time that provides golden opportunities for education in all areas including health. Educational and cultural activities in the subway, as a place where a lot of people are present, are becoming increasingly important. Educational posters in subway in Paris, London, Tokyo, etc. are examples of these activities (Negreyeva and Prasad, 2012).

Another feature found in the present study for education during commutes was "cost-effectiveness" that is related to the costs and benefits of implementation of an education method. The method selected for education should be cost-effective. The costs of education courses for many organizations are high (Noe and Tews, 2012). For example, according to American Society for Education & Development (ASTD), the U.S. organizations spend more than \$126 billion annually on employee education and development . Therefore, cost-effectiveness of employee education methods is of high importance for any organization (Kim and Ployhart, 2014).

Exposure to message (accessibility) was another feature to be considered in selecting teaching methods. In fact, methods used for employee education during commutes should expose employees to the desired

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messages. One of the most important factors in increasing the usability of employee education programs is their accessibility. The study by Qaedi *et al.*, identified three factors of content, accessibility and management as effective in e-learning. An important factor affecting the success of social mobilization is that messages should be visible and accessible to extensive groups of audience. Exposing people to persuasive health messages can influence their behavior (Hornik and Yanovitzky, 2003; Wakefield *et al.*, 2010).

"Visual presentation of content" and "involvement of different senses" are the sixth and seventh features of an appropriate commuting education method. Visual effects should be used and multiple senses be engaged to present the message. Materials are learned with the help of senses and perceptions. From this perspective, people acquire environmental knowledge through four sensory modalities: visual, auditory, reading/writing and kinesthetic (Peyman *et al.*, 2012; Subramaniam *et al.*, 2013). Johannesson discusses the role of the senses in learning and stresses the importance of visual and tactile senses in obtaining information (Bjerrum *et al.*, 2012; Johannesson *et al.*, 2013). Education that can involve different senses, i.e. is multisensory, can help enhance the learning experience and thereby increase retention of information (Hairston *et al.*, 2003). People remember 20% of what they read, 30% of what they hear, 40% of what they see, 50% of what they say, 60% of what they do and 90% of what they say, hear, see and do (Peyman *et al.*, 2012).

"Attractiveness" is another feature a good method of education. It should be able to draw attention to the message and to motivate people. Attracting the target audience to deliver health messages to them is an important challenge for health education and communication (Hastall and Knobloch-Westerwick, 2013). Using innovative methods of delivering messages can encourage the audience and attract their attention. The method should be attractive so that the audience can acquire it fully. Such methods can concentrate mental powers on the message and are thus more effective (Schiavo, 2013).

Another feature identified in this study is "safety of the method". That is, during education, the health of people involved (educators, trainees and driver of the vehicle) should not be compromised. In this regard, problems regarding their physical health (visual disturbances, headache, and dizziness), mental health (anxiety, concentration problems) and social health (weakening of relationships) should be prevented. Safety is a critical component of health care that can help prevent any damage to people during service provision (Shahrabadi *et al.*, 2014). Health organizations at the beginning of the 21st century started attempts to improve safety in health care and stress its increasing importance (Matsubara *et al.*, 2008; Shahrabadi *et al.*, 2014). Education employees on safety issues is helpful in enhancing their knowledge, attitude and performance to create a positive safety culture in the workplace (Fang and Wu, 2013; Frazier *et al.*, 2013). When determining its strategy for implementation of the health education programs, each organization should pay attention to safety and put it as a priority (El-Jardali *et al.*, 2010).

"Possibility of two-way communication" is one of the features of education during commutes stressed by participants in this study. The interaction between learners and instructors via questions and answer must be provided during and after education. This can involve and motivate people. Teaching and learning is a joint and interactive activity between teacher and learner where they form meaning and understanding. Communication in its various forms (verbal, gestures and symbols) is essential for a better understanding of shared experiences (Carlson, 2013). This interaction facilitates the achievement of educational goals and stresses the role of proper communication in successful education (Heydari and Latifnejad, 2013). Indeed, interactions and communication are the pillars of all education programs and are essential in the learning process. In this regard, Jonassen, Vygotsky and Dewey state that learning occurs through interaction with others (Purjamshidi *et al.*, 2014).

Conclusion

Efficient use of time is important. Most people, especially factory workers spend part of their time in their home-work commutes. However, in majority of cases, this time is ignored and it is necessary to take measures to make use of such a valuable resource. One way to do this is to carry out educational programs with proper planning during commutes to increase commuters' knowledge. Proper education methods should be used to this end, so that people can make efficient use of their commuting time.

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Considering characteristics of a good method of education is very important in all situations, especially in education during commutes. Such a method can guarantee the effectiveness and efficiency of these education programs.

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