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A study to assess the knowledge of the warning signs of foot ulcer deterioration among patients with diabetes, Pune city

Sanjay Chandrkant Sabde, Dr. Rupali Salvi and Dr. Nisha Naik

Abstract

Introduction: Diabetic foot ulcer is one of the common presentations of diabetic foot. The diabetic foot may be defined as a group of syndromes in which neuropathy, ischemia and infection lead to tissue breakdown, resulting in morbidity and possible amputation (World Health Organization, 1995). Problem statement A Study to assess the Knowledge of the warning signs of foot ulcer deterioration among patients with diabetes Pune city.

Materials and Methods: Research Approach Evaluatory approach: was used this study. Single group pre-test-post-test pre-experimental one group pre-test design was used this study. Sample size was 20. The conceptual framework of this study was based upon General System Theory. This theory has three components that is Input, throughput and output and feedback. Matter energy and information that enter the system are called input.

Results: Majority of i.e. 93.5% of the people had poor knowledge (score 0-7) regarding dengue fever, 6% of people had average knowledge (score 8-14) and only 0.5% of people had good knowledge (Score 15-20) regarding dengue fever.

Keywords: Knowledge, diabetes, foot self-care practices, foot ulcer

Introduction

Diabetic foot ulcer is one of the common presentations of diabetic foot. The diabetic foot may be defined as a group of syndromes in which neuropathy, ischemia and infection lead to tissue breakdown, resulting in morbidity and possible amputation (World Health Organization, 1995).

According to epidemiological studies, the number of patients with DM increased from about 30 million cases in 1985, 177 million in 2000, 285 million in 2010, and estimated if the situation continues, more than 360 million people by 2030 will have DM. 4-6 According to Wilman *et al*, diabetic foot ulceration is a worldwide health problem approximately 15% of the 10 million diabetic patients in USA will develop foot ulcer at some time in their life time.7 The foot ulcer in this population is extremely debilitating and dramatically increases the risk of lower extremity amputation.

According to the Diabetes Atlas 2013 published by the International Diabetes Federation, the number of people with diabetes in India currently is 65.1 million, which is expected to rise to 142.7 million by 2035.8 The clinical study of diabetic foot ulcer is undertaken to assess the various presentations of diabetic foot ulcer like, resistant deep infections, ulcer with cellulites, severe ischemia leading on to gangrene and to study percentage of surgical intervention like debridement, minor/major amputation.

Diabetic foot ulcer (DFU) is one of the common complications of diabetes and a common precursor to lower limb amputation, with an associated lower-limb amputation rate as high as 25%–28%. Fortunately, most subsequent lower limb amputations may be avoided. Specifically, 80% of subsequent lower limb amputations may be avoided by aggressive treatment of Diabetic Foot Ulcer as well as treatment seeking on a timely basis According to the Diabetic Foot Ulcer management guidelines, patients should seek treatment for their foot ulcers as soon as possible after finding the ulcer, preferably within 24 hours). Nevertheless, previous studies have revealed that only 4.4% patients seek treatment for their Diabetic Foot Ulcer within 24 hours after ulcer occurrence On the basis of the accessibility of medical

facilities, most patients with DFUs should be able to seek medical treatment within 3 days. In study, however, only approximately half of the patients sought treatment for their DFU within 3 days of ulcer occurrence. Furthermore, the time between the onset of their ulcer and first treatment seeking was up to 243 days, with a median time of 3 days. The longer the delay in seeking treatment, the higher the risk of lower limb amputation and mortality

Methodology

Research approach: Evaluatory approach was used in this study.

Research design: to fulfill the objective of the study, single group pre-test-post-test pre-experimental one group pre-test design was used for data collection and analysis of data.

Variables under study

Dependent variable: In this study dependent variable is the knowledge among the people regarding diabetic foot ulcer.

Independent variable: In this study independent variable is demographic profile of sample such as age, gender, occupation, income, education, knowledge, and source

Research setting: The setting for this study was the selected areas of the Gawali nagar, Phuleaagar, and Vitthalnagar of Pimpri chinchwad Municipal Corporation of Pune city.

Population

The population of the present study conducted in people residing at Gawali nagar, Phulenagar, and Vitthalnagar of Pimpri chinchwad Municipal Corporation of Pune city.

Sample

In the present study the samples are people at age of 20 to 60 years from selected areas.

Sample selection criteria (Inclusion and Exclusion)

Inclusion criteria

- Samples at the age of 20 to 60 years
- Samples who are residing in at selected areas
- Samples can understand, read and write Marathi and English

Exclusion criteria

- Samples those are not willing to participate

Sample size: 20

Sampling technique: Non probability Convenience sampling technique–non probability sampling technique was used in this study.

Development of tool

Although we are all accustomed to asking questions, the proper phrasing of questions in a research study is a delicate task. A questionnaire is a means of eliciting the feelings, beliefs, experiences, perceptions or practices of some sample of individuals. As a data collecting instrument, it could be structured or unstructured^[51].

A structured questionnaire and observational check list was developed for identifying the knowledge and practice

regarding diabetic foot ulcer among people in selected area. In this study the structured questionnaire and practice check list was worded in a manner that could minimize the risk of response biases, enhance clarity and unambiguity, and be courteous to the needs and rights of respondents especially when asking questions of highly private nature. For the selection of the items and preparation of the tool, the following steps were taken.

- Review of literature: scholarly and non-scholarly articles
- Opinion and suggestion were taken from experts

Description of the tool

The researcher prepared a structured questionnaire and observational check list as the tool for study.

The self-structured questionnaire included three sections-

It includes three sections

Section I: This section included total 7 items seeking information on demographic profile of sample such as age, gender, occupation, income, education, knowledge, and source.

Section II: This section contains 20 items to identify the knowledge among the people regarding diabetic foot ulcer.

It comprises questions on following broad aspects

- Meaning and awareness of diabetic foot ulcer
- Sign and symptoms of diabetic foot ulcer
- Precautions from diabetic foot ulcer
- Prevention from diabetic foot ulcer
- Complication of diabetic foot ulcer

The structure of the total questionnaire was developed into five broad points to identify knowledge regarding diabetic foot ulcer among people. The total questionnaire deals with 20 items to identify the level of knowledge regarding diabetic of foot ulcer among the scores of section II were measured based on the worth of correct answers where response was given a score of an I and incorrect response score of 0 with undecided answers included in the incorrect category. In this section total scores range from a minimum of zero to a maximum score of 20. Questions in section II are used for identify the knowledge regarding diabetic foot ulcer among the people.

Section III: This section consisted of total 15 items which was developed using observational check list to identify the practice regarding diabetic foot ulcer among the people.

Each item was formulated to assess the practice of people regarding diabetic foot ulcer. The scores of section III were measured based on the worth of poor practice, average, and good. Response was corrected by giving points 5, 4, 3, 2, and 1 respectively. Questions in section III were used to identify the practice regarding diabetic foot ulcer among the people.

Observational checklist is developed to assess the practices of people regarding diabetic foot ulcer.

Checklist consists of 15 practices. It consists of Yes or No type question. Each Yes answer carries 1 mark and No answer 0. The practice score categories into.

- a. Poor Practice: 1-5 marks
- b. Average level of practice: 6-10 marks
- c. Good Practice: 11-15 marks

Validity

The content validity of the tool enclosed, Self-Structured Questionnaire with three sections pertaining to questions on assessing the demographic information and knowledge assessment regarding diabetic foot ulcer.

The validity was established by experts from different specialties i.e. From Preventive and Social Medicine, Community Health Nursing(8), Medical Surgical Nursing(4), Preventive and Social Medicine(2), Medicine Department(1) and Statistics(1). The experts were selected based on their clinical expertise, experience and interest in the problem being studied. They were requested to give their opinions on the appropriateness and relevance of the items in the tool. As a whole the suggestions and comments of experts included grammatical corrections of the sentences. The tool was found to be relevant. The necessary modification has been done as per the expert's advice. The experts suggested adding few more questions on preventive measures of diabetic foot ulcer.

In section one; the questions remained the same except few modifications in choices given for items in demographic data.

In section II item number 6, 20 options are modified as per given suggestions and item number 11, 13, 18 are reframed and the questions were rearranged according to the sequence.

After validation of content, it was translated to the local language of Marathi from English for easy understanding by the parents, by a bi-language expert (an expert both in Marathi and English).

Ethical consideration

- Researcher had obtained approval from appropriate review boards to conduct the study.
- Researcher had taken formal permission from the patients to conduct study.
- Only the samples who had signed the consent form are included in the study.
- Confidentiality of the data is maintained strictly

Reliability

In this study, the reliability was determined by administering structured questionnaire to 10 selected people from the slum (Gawali nagar). The reliability co-efficient was calculated using "Cronbach's Alpha Method. The reliability co-efficient was 0.84 the items were coded and reliability was calculated. The reliability co-efficient was found to be 0.88 significant.

Plan for data collection

Data collection commenced after the prior permission taken from the local leader and P.C.M.C.

The data collection was done from 23-7-2020 to 26-7-2020 and ended on 1-8-2020 to 3-8-2020. A starting of this session to the group of people was introduced by investigator. They were explained about the purpose of the study and assured about confidentiality of the information between the investigator and the respondent only. Their willingness was sought for.

The investigator himself administered the structured questionnaire for the pre-test. Everyday 5 samples were taken for pre-test respectively from 23-7-2020 to 26-7-2020 and ended on 1-8-2020 to 3-8-2020. The duration of data collection for pre-test was 10 minutes. Health teaching was

given to these study groups in Marathi language as all the participants were Marathi speaking people. Hence the section was a pleasant experience.

The instructions about post-test was given to the respective participants, after seventh day of the pre-test; the post test was conducted from dated 1-8-2020 to 3-8-2020 respectively by the investigator. Time taken for post-test was approximately 10 minutes.

Data analysis and interpretation

- Items related to the background variables were analyzed in terms of frequency and percentages.
- Scores was graded in 3 categories i.e. Poor, Average and Good
- Frequency distribution were plotted to represent the final score.
- Mean, standard deviation of the test was computed.
- The findings were documented in tables, graphs and diagrams.

Pilot study

After doing pilot study investigator found that it is feasible to carry out actual study. A pilot study was conducted by the investigator to the people in urban areas from 17th July to 25th July 2020 to test the practicability of this tool and to decide on a plan for a statistical analysis. The study was conducted on 10 peoples.

Result

The major findings of the study were based on the objective of the study.

- To assess the Knowledge Regarding the Warning Signs of Diabetic Foot Ulcer Deteriorations.
- To determine the association between knowledge score of Diabetic Foot Ulcer with selected Demographic variable.
- To associate the knowledge and practice regarding diabetic Foot Ulcer with selected demographic variables.

Major findings of the studying related to samples demographic characteristics as follows**Section I: Demographic characteristics**

- 31.7% of them were in age group 31-40 years, 51.7% of the samples were in age group 21-30 years, and only 16.7% of them were from age group 41-50 years.
- 25.0% of people had their primary education, 36.7% of them had secondary education, and 6.7% of them had graduation.
- The who were participated in the study among them 48.5% were males and 36.3% were females.63.3%
- Samples had daily wages/unemployed, 18.3% of them had Govt. service, 46.9% of them had Pvt. Service and others mostly 83% / 26.7% of them had some other occupation.
- 28.3% samples had their monthly income Rs. 3001 - 5000, 28.3% of them had income more than Rs. 5000, 16.7% of them had income Rs. 5001 -10,000 and only 55% of them had income below Rs. 3000.
- In pretest, majority of 65% of the people had poor knowledge (score 0-6) and 35% of them had average knowledge (score 7-13) regarding diabetic foot ulcer. In posttest, 45% of them had good knowledge (Score 14-

20) and 55% of them had average knowledge (score 7-13) regarding diabetic foot ulcer

Section II: Data analysis related knowledge regarding diabetes foot ulcer among the people

In pretest, majority of 65% of the people had poor knowledge (score 0-6) and 35% of them had average knowledge (score 7-13) regarding diabetic foot ulcer.

In pre-test, more than half (53.3%) of the people had good practices (score 11-15) and 46.7% of them had average practices (score 6-10) regarding diabetic foot ulcer

- The majority of findings show that 50% of the people knew about diabetic foot ulcer from hospital, 21. % of them knew diabetic foot ulcer from mass media, 9% of them knew it from literature and 20% of them knew about it from family.
- 30.5 % of people know that diabetic foot ulcer is curable.
- 8.5% of people are known that families are beneficiaries for diabetic foot ulcer.
- 14.5% of people are having knowledge that diabetic foot ulcers reduces infection by taking precaution majors.
- 13.5% people know that there is need to minimize bourdon of family members.
- 17.5 know that diabetic foot ulcer should not perform as outdoor procedure.
- 16.0% of people know the cause of diabetic foot ulcer.
- 26.0% of people have wrong knowledge that After a diabetic foot ulcer precaution
- 32.5% people know there is no adverse effect of diabetic foot ulcer. 19.0 people that diabetic foot ulcer cannot stop the spread of infection.
- 22.0% people know that there is no any negative impact on self-image of diabetic foot ulcer.
- 36.0% of people know that psychologically adjusted of diabetic foot ulcer.
- 15.5% people know that diabetic foot ulcer is dangerous.
- 8.5% of people know that diabetic foot ulcer can caused adverse effect.
- 18.0% of people know that diabetic foot ulcer cases are admitted in hospital.
- 16.5% of people know that diabetic foot ulcer is viral infection.

- 15.5% of people know the cause of diabetic foot ulcer.
- 27.0% of people know that diabetic foot ulcer is harmful.
- 26.5 % of people know the diabetic foot ulcer can treated immediately.

Section III: Analysis of data related to the effect on knowledge and practice on diabetic foot ulcer

In pre-test, majority of 65% of the people had poor knowledge (score 0-6) and 35% of them had average knowledge (score 7-13) regarding diabetic foot ulcer. In post-test, 45% of them had good knowledge (Score 14-20) and 55% of them had average knowledge (score 7-13) regarding diabetic foot ulcer.

Researcher applied paired t-test for comparison of pre-test and post-test knowledge scores of people regarding diabetic foot ulcer. Average knowledge score in pre-test was 5.2 which increased to 12.6 in post-test.

T-value for this comparison was 13.6 with 59 degrees of freedom. Corresponding p-value was of the order of 0.000 which is small (less than 0.05), the null hypothesis is rejected.

Section IV: Analysis of data related to the association of knowledge and practice regarding diabetic foot ulcer with selected demographic variables

Association of knowledge and practice regarding diabetic foot ulcer with selected demographic variables was assessed using Fisher's exact test.

The summary of Fisher's exact test results is tabulated below:

Since p-values corresponding to gender, occupation, monthly income and education were small (less than 0.05), the null hypothesis is rejected. Demographic variables gender, occupation, monthly income and education were found to have significant association with knowledge of people regarding dengue fever.

Since all the p-values were large (greater than 0.05), there is no evidence against null hypothesis. None of the demographic variable was found to have significant association with practices of people regarding diabetic foot ulcer.

Description of samples (patients) based on their personal characteristics

Table 1: Description of samples (patients) based on their personal characteristics in terms of frequency and percentages, N = 20

Demographic variable	Freq.	%
Age		
20 – 22 years	20	100%
Gender		
Male	1	5%
Female	19	95%
Religion		
Hindu	4	20%
Christian	16	80%
Education		
Unable to Read	2	10%
Read And Write	3	15%
Secondary Education	15	75%
Work experience		
0 - 1 years	13	65%
2 - 3 years	2	10%
4 – 5 years	1	5%

6 – 7 years	4	20%
Marital Status		
Single	4	20%
Married	14	70%
Separated	2	10%
Occupation		
Housewife	5	25%
Business	4	20%
Farmer	11	55%
Residence		
Urban	8	40%
Rural	12	60%
Monthly Income		
10,000/- to 15,000	13	65%
20,000/- to 25,000	3	15%
30,000 to 35,000	4	20%
Type of family		
Nuclear	3	15%
Joint	12	60%
Extended	5	25%
Number of Children		
One	8	40%
Two	3	15%
Three	9	45%
Previous history of Family Member from Diabetes		
Yes	8	40%
No	12	60%
If yes, what are the treatment modalities taken		
Blood Test	6	30%
Fasting Blood Sugar	2	10%

Table 1

All the patients had age 20-22 years. 5% of them were males and 95% of them were females. 20% of them were Hindu and 80% of them were Christians. 10% of them were unable to read, 15% of them could read and write and 75% of them had secondary education. 65% of them had 0-1 years of work experience, 10% of them had work experience 2-3 years, 5% of them had 4-5 years of work experience and 20% of them had 6-7 years of experience. 20% of them were single, 70% of them were married and 10% of them were separated. 25% of them were housewives, 20% of them had business and 55% of them were farmers.

40% of them were from urban residence and 60% of them had rural residence. 65% of them had monthly income Rs.10000-15000, 15% of them had monthly income Rs.20000-25000 and 20% of them had monthly income Rs.30000-35000. 15% of them had nuclear family, 60% of them had joint family and 25% of them had extended family. 40% of them had one child, 15% of them had two children and 45% of them had three children. 40% of them had previous history of family member from diabetes. 30% of them had blood test and 10% of them had fasting blood sugar.

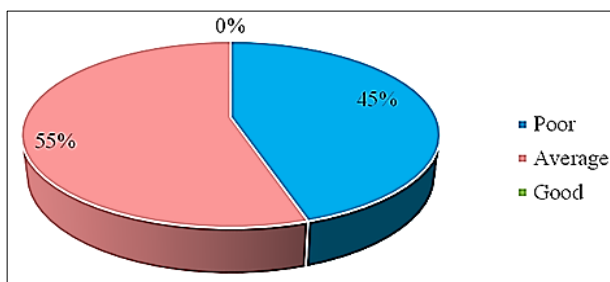


Fig 1: Knowledge regarding the warning signs of diabetic foot ulcer deteriorations: 45% of the patients had poor knowledge (score 0-6) and 55% of them had average knowledge (score 7-13) regarding the warning signs of diabetic foot ulcer deteriorations

Conclusion

This study highlights that knowledge and awareness doesn't always lead to the importance of cleanliness. One needs to understand the level of awareness and practices in the community before implementing the programme. There is a need to educate and motivate the people to keep area clean. Present suggest that there is need to improve knowledge level and practice of people toward diabetic foot ulcer

The study reveals that 12 participants (60%) are having good knowledge regarding self-administration of insulin injection, 6 participants (30%) are having average knowledge regarding self-administration of insulin injection and 2 participants (10%) are having poor knowledge regarding self-administration of insulin injection.

Discussion

The findings of the study have been discussed with reference to the objectives and hypothesis. Analysis of first phase revealed that the majority (31.7%) of samples were between age group 31-40 years. Majority of samples (63.3%) were females. Majority of samples belongs to secondary education (36.7%).

In consideration with family income most of the samples (55. %) we're having monthly income between Rs.3000/-. Most of the samples (63.33%) doesn't have knowledge regarding diabetic foot ulcer and some of the samples (36.66%) got information regarding diabetic foot ulcer through newspaper and television.

The 65% of people in pre-test of experimental group had poor knowledge score (0-6), and remaining 38.0% of people were having average knowledge score (7-13). Where as in post-test majority 65% of people had good knowledge score (above 14), 35% were in average category (14-20) and no one was in poor knowledge score.

Majority of the samples scored high in post-test than that of pre-test and the mean percentage score of samples regarding knowledge of diabetic foot ulcer was higher in post-test than that of pre-test. The knowledge scores of the people shows a marked increase as seen in the post test score of the experimental group, which indicates that the practice is effective in increasing the knowledge of samples regarding diabetic foot ulcer in people.

Limitations

The study is limited to:

The researcher had no control over the events that took place between pre-test and post-test as this study didn't use control group, hence the result of the study must be generalized with the caution as there is threat to internal validity

Recommendations

Following study can be undertaken in relation to present study.

- The comparative study can be done in the rural and urban areas.
- A study can be replicated on large samples so there by findings can be generalize.
- A study may be conducted to evaluate the effectiveness of planned health practice regarding diabetic foot ulcer.
- The study can be taken in different settings and different target population such as health workers, graduate students, bank employees, industrial employees and teachers.
- A study can be done on association between various demographic variables, which were significant on larger samples.
- Study can be conducted at hospital settings among the people to assess their practice and effort can be done to assess their knowledge and effective practice regarding diabetic foot ulcer.
- A study can be conducted to know the existing role of the nursing personnel regarding diabetic foot ulcer.

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