Study on Occupational Health Problems and Evaluate the Effectiveness of Planned Teaching Program on Prevention and Management of Occupational Health Problems in Terms of Knowledge and Practice

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Abstract: *Occupational health is concerned with health in its relation to work and working environment. Occupational health includes health protection, health promotion, emergency care, wide range of preventive, curative services, a concept which includes everything that can apply to promote the health and working capacity of worker. Industrial workers are mainly exposed to five types of hazards they are physical hazards like heat, cold, light, noise, vibration, ultraviolet radiation. Chemical hazards like inhalation of dust, gases etc. Biological hazards like leptospirosis, anthrax, fungal infection etc. psychological hazards like anxiety, depression, alcoholism, drug abuse, absenteeism etc. Mechanical hazards like injuries and accidents.*

Materials and Methods: Descriptive survey & Pre -experimental, one group pre-test post- test design was used to evaluate the effectiveness of planned teaching programme on prevention and management of occupational health problems in terms of knowledge and practice. The study conducted on 100 samples. Data was collected using structured questionnaire ondemographic data, symptom assessment rating scale, structured knowledge questionnaire, expressed practice rating scale.

Results: In this study the assessment of various occupational health problem, biophysical parameters and random blood glucose. The mean post-test knowledge score of the mining workers on prevention and management of occupational health problem is higher (15.65) than the mean of pre-test knowledge score (9.05). It shows the effectiveness of the planned teaching program. The data furthers shows that the median for the pre-test was 9 and whereas for the post-test was 16, which both are closer to the pre-test mean 9.05 and post-test mean 15.65 respectively. The calculated "t" value (20.14) is higher than the table (1.98) for the df 99 and it was found statistically significant at 0.05 level of significant. The shows that the planned teaching programme was effective in enhancing the knowledge of mining workers regarding prevention and management of occupational health problems. The mean post-test practice score of the mining workers on prevention and management of occupational health problem is higher (50.40) than the mean of pre-test practice score (20.65). This shows that effectiveness of the planned teaching program in improving the practice of mining workers. The calculated "t" value (16.55) is higher than the table "t" value (1.98) for df 99 and it was found statistically significant at 0.05 level of significance. The shows that the planned teaching program was effective in enhancing the practice of mining workers regarding prevention and management of occupational health problems.

Conclusion: Maximum mining workers were having the respiratory problem like asthma and hearing problem, vision impairment and heat stroke. During physical health assessment workers were found overweight. underweight and abnormal random blood glucose. System wise assessment reveled that the workers were having problems like runny nose, sore throat, nausea and dry cracked skin. Mining workers were deficit in terms of knowledge and practice regarding the prevention and management of occupational health problems. The planned teaching programme was effective in improving knowledge and practice of mining workers regarding prevention and management of occupational health problem.

There was a positive correlation between post-test knowledge score and post-test practice score of mining workersregarding prevention and management occupational health problem, which shows that as the knowledge scores increases, the practice also gets increased. The knowledge score and practice score of mining worker is associated with monthly income.

Keywords: Occupational health problems, planned teaching program, prevention and management of occupational health problems.

I. INTRODUCTION

Occupational health is concerned with health in its relation to work and working environment. Occupational health includes health protection, health promotion, emergency care, wide range of preventive, curative services, a concept which includes everything that can apply to promote the health and working capacity of worker. The influence of work on health are often described as the top of the 'ice berg' because many Work-related health problems goes unreported, the amount of human suffering, economic loss and decreased productivity are associated with workplace hazards. Industrial workers are mainly exposed to five types of hazards they are physical hazards like heat, cold, light, noise, vibration, ultraviolet radiation. Chemical hazards like inhalation of dust, gases etc. There are many health hazards which affect the worker in the working area, the health hazards which affect the health of worker in the quarry are falls, blasting accidents, detachment of rocks, injuries of hands, eyes, legs from the stone and respiratory diseases due to inhalation of dust like allergic rhinitis, bronchitis, asthma, silicosis. Indian council medical research annual report 2010-11 estimated that 17% occupational disease are occurring in the world and 18% of deaths due to occupational diseases takes place in India. Occupational health is to provide a safe occupational environment in order to safe guard the health of the workers. India, a growing economy and world's largest democracy, has population exceeding 1.2 billion. Out of this huge number, 63.6% form working age group. More than 90% work in the informal economy, mainly agriculture and services. Less than 10% work in the organized sector; mainly industry, mining and some services.

II. OBJECTIVES OF STUDY

1. To assess the occupational health problems among mining worker
2. To assess and evaluate the knowledge and practice of mining workers regarding prevention and management of occupational health problems before and after the administration of the planned teaching programme.
3. To determine the relationship between knowledge and practice before and after the administration of planned teaching programme regarding prevention and management of occupational health problems among mining workers.
4. To determine association between knowledge and practice score regarding prevention and management of occupational health problems among mining workers after administration of planned teaching programme with selected variables.

III. MATERIALS AND METHODS

Descriptive survey & Pre -experimental, one group pre-test post- test design was used to evaluate the effectiveness of planned teaching programme on prevention and management of occupational health problems in terms of knowledge and practice. The study conducted on 100 samples. Data was collected usingstructured questionnaireon demographic data, symptom assessment rating scale, structured knowledge questionnaire, expressed practice rating scale.

Section A: Demographic Data

It consists of 12 items which ascertained information regarding age, sex, marital status, educational qualification, total year of experiences, family type, monthly family income, health check-up, history of substance abuse, history of any of the diseases, change in the department after diagnosed of disease, any injury (major/minor) within a 1 years, which body part/parts of the body is affected due to injury.

Section B: Symptom Assessment Rating Scale

It consists of 32 question indicating symptoms of various occupational health problems. It is a 3-point scale to determine the frequency of occurrence of these symptoms perceived by mining workers. The 3-point scales consist of responses as always, sometime, never with score 3,2,1 respectively.

Section C: Structured Knowledge Questionnaire

It comprises of 20 multiple choices on prevention and management of occupational health problem. Each question has one correct answer and carries a score 1. The incorrect answers carry no scores points. The possible range of the knowledge score is 0-20 and the knowledge level is categories are as follows –

Category Range	Score
Excellent	16-20
Good	11-15
Average	6-10
Poor	0-5

Section D: Expressed Practice Rating Scale

The practice rating scale was develop consisting of 20 items. The practice rating scale was develop having 3 points always, sometime, and never with total score of 60.

Practice scoring range from 20-60 and categories as follows-

Categories	Score Range
Excellent Practice	51-60
Good Practice	41-50
Average Practice	31-40
Poor Practice	20-30

In order to measure the content validity, the tools were given to 11 expertsfrom the field of Occupational health medical officers, Respiratory medicine, Medical surgical and Community health nursing. The expert was requested to judge content based on objectives, relevance, adequacy of the content, organisation, clarity and understanding. Most of the experts agreed on all the item, with some suggestions for modification of the items. The modification was done as per valuable suggestions given by the experts and the tool was finalized.

Reliability of the Tool

SR.NO	RESEARCHTOOL	METHOD OFCOMPUTINGRELIABILITY	RELIABILITYCOEFFICIENT
1	Weighing machine	Interobserver reliability	0.9
2	Glucometer	Interobserver reliability	0.9
3	BP apparatus	Interobserver reliability	0.9

4	Measuring tape	Interobserver reliability	1.0
5	Structured occupational health problem assessment rating scale.	Cronbachalpha	0.74
6	Structured knowledge questionnaire	KR20	0.84
7	Practicerating scale	Cronbachalpha	0.72

Final study was conducted on 100 samples. The sample for the study comprised mining workers, who met the designated criteria were selected through purposive sampling technique. Objectives of study was discussed and obtained consent for participation in study. Base line data was assessed by self-administered knowledge questionnaire. Based on the objective and the hypothesis the data was analysed by using various statistical tests i.e. percentage, mean, paired t test and chi square test.

Statistical Methods

The data collected from the participants was planned to be analysed on the basis of the objectives of the study using descriptive and inferential statistics. Data was organized data in a master data sheet. Data analysis is the systematic organization of research data and the testing of research hypothesis using that data. The plan of data analysis was as follows

- Demographic data would be analysed in terms of frequency and percentage.
- Symptom assessment rating scale would be analysed by frequency and percentage.
- The knowledge and practice on occupational health workers would be analysed in terms of frequency and percentage.
- Effectiveness of planned teaching programme among mining workers would be analysed by mean, standard deviation, mean percentage, mean difference and paired ─t' test.
- The association of pre-test knowledge score with demographic variables would be assessed by using chi-square test.

IV. RESULTS

Section I: Distribution of sample characteristics according to demographic variables of mining worker

Table no -1 (N = 100)

SR.NO	PERSONALDATA	FREQUENCY	PERCENTAGE
1	SEX		
1.1	Male	100	100 %
1.2	Female	0	0
2	Age		
2.1	20-30years	17	17 %
2.2	31-40years	26	26 %
2.3	41-50years	24	24 %
2.4	51-60years	33	33 %
3	EDUCATIONALSTATUS		

S.NO	PERSONAL DATA	FREQUENCY	PERCENTAGE
3.1	5thPass	0	0 %
3.2	8thPass	25	25 %
3.3	10thPass	28	28 %
3.4	12thPass	20	20 %
S.NO	PERSONAL DATA	FREQUENCY	PERCENTAGE
3.5	ITI (Diploma)	15	15 %
3.6	Graduation	12	12 %
3.7	Any Other	0	0 %
4	TOTALYEAROFEXPERIENCE		
4.1	0-5Years	5	5%
4.2	6-10Years	25	25%
4.3	11-15Years	15	15%
4.4	16-20Years	20	20%
4.5	21-25Years	25	25%
4.6	>25Year	10	10%
5	MONTHLYFAMILYINCOME		
5.1	<Rs 25000	0	0 %
5.2	Rs25001-50000	35	35 %
5.3	Rs50001-75000	45	45 %
5.4	>Rs75000	20	20 %
6	MARITALSTATUS		
6.1	Married	97	97 %
6.2	Unmarried	3	3 %
6.3	Divorced	0	0 %
6.4	Separated	0	0 %
7	FAMILYTYPE		
7.1	Nuclear	79	79%

7.2	Joint	16	16%
7.3	Extended	5	5%
8	**HEALTHCHECK-UP**		
8.1	Once in a year	20	20%
8.2	Twice in a year	10	10%
8.3	After injury	70	70%
8.4	Never	0	0%
9	**HISTORYOFSUBSTANCEUSE**		
9.1	Alcohol	21	21%
9.2	Smoking tobacco	30	30%
9.3	Chewing tobacco	14	14%
9.4	Any other	5	5%
S.NO	PERSONAL DATA	FREQUENCY	PERCENTAGE
10	**AREYOUDIAGNOSED WITHANY OF THEALIMENTS**		
10.1	Hearing impairment	11	11%
10.2	Vision impairment	8	8%
10.3	Heatstroke	9	9%
10.5	Asthma	13	13%
10.6	Tuberculosis	2	2%
10.7	Skin allergies'	9	9%
10.8	Stroke	3	3%
10.9	Heart disease	8	8%
10.10	Cancer	2	2%
10.11	Infertility	1	1%
10.12	Any others	7	7%
11	**AFTER DIAGNOSED WITH ANY OF AILMENT ARE YOUWORKINGIN SAME AREA**		
11.1	Yes	50	50%

11.2	No	23	23%
12	**ANYINJURYDURINGWORKINGINTHEKCCMINIGINLAST ONE YEAR**		
12.1	Head injury	10	10 %
12.2	Crushing injury	15	15 %
12.3	Chemical burn	2	2 %
12.4	Electric burn	2	2%
12.5	Fracture	6	6%
12.6	Others	7	7%

Regarding the sex distribution 100 % were male no female in the KCC Mining. With respect to age distribution 33 % were in age group 51-60 years, 26 % were in the age group 31-40 years, 24 % were in age group 41-50, and 17% were in the age group of 20-30 years. With respect to educational status majority 28 % were 10th pass ,25 % were 8th, 20 % 12th pass, 15 % ITI (diploma), and 12 % Graduate. Total year of experience 21-25 years 25 %, 6-10 years 25% ,16-20 years 20% ,11-15 years 15%,above 25 years 10 % and 0-5 years 5%. Regarding monthly income, majority of sample 45 % has a monthly income of 50001-75000, 35 % income between 25001-50000 and 20% above 75000. Regarding marital status 97 % were married and 3% were unmarried. Regarding family type 79 % were nuclear, 16 % were joint and 5 % extended.

With respect to health check-up 70% after injury, 20 % once in a year and 10 % twice in a year. Regarding substance abuse 30% were taking tobacco ,21% were taking alcohol, 14% were chewing pan masala. Here 73% had health issue and the remaining 27 % did not suffer from any aliment. (Majority of workers 13% were diagnosed with asthma,11% hearing impairment, 9 %heat stroke ,8% vision impairment, 9% skin problem, 5% of heart disease, cancer, respectively). Majority of workers 50% were remain in the same area even after diagnosis of the disease and only 23 % were changed their work. Regarding injury within a year, 15% crushing injury, 10% head injury, 6% fracture, 2% electric burn.

Section – II Finding related to the assessment of occupational health problems.
Table no – 2 (N = 100)

S.no	Area of problem and symptoms		Always		Sometime		Never	
			F	**%**	**F**	**%**	**F**	**%**
1	**Respiratory problems**	Running nose	2	2%	60	60%	38	38%
		Sore throat	1	1%	59	59 %	40	40%
		Difficulty in breathing	5	5%	35	35 %	60	60%
		Cough	2	2%	30	30%	68	68 %
		Blood in sputum	0	0%	1	1%	99	99%
		Rapid breathing	1	1%	5	5%	94	94%

S.no	Area of problem and symptoms		Always		Sometime		Never	
			F	%	F	%	F	%
2	Cardio vascular problems	Chest tightness	1	1%	4	4%	95	95%
		Chest pain	0	0%	3	3%	97	97 %
		Fatigue	6	6%	20	20%	74	74%
		Palpitation	0	0%	10	10%	90	90%
		Swelling on faceand limbs	0	0%	0	0%	20	100 %
		Restlessness when stairs up	5	5%	16	16%	79	79%
3	Skin problems	Dry , cracked skin	4	4%	40	40%	56	56%
		Discolored patches of skin	0	0%	2	2%	98	98%
		Itching	1	1%	17	17%	82	82%
		Redness of skin	0	0%	6	6%	94	94%
4	Nervous system problems	Altered smell or taste	0	0%	15	15%	85	85%
		Difficulty in remembering things.	0	0%	8	8%	92	92%
		Headache	1	1%	39	39%	60	60%
		Irritable from loud noise	15	15%	55	55%	30	30%
		Weakness or loss of muscles strength	0	0%	2	2%	98	98 %
5	Psychological problems	Feel worries or fears	1	1%	18	18%	81	81%
		Inability to cope with daily problems	0	0%	4	4%	96	96 %
		Lack of sleeping	1	1%	19	19%	80	80%
		Get angry easily	0	0%	15	15%	85	85%
		Lack of interest in work	1	1%	10	10%	89	89%

6	Gastro intesti nal proble ms	Difficulty in swallowing	0	0%	5	5%	95	95%
		Nausea	1	1%	29	29%	70	70%
		Blood in vomiting	0	0%	1	1%	99	99%
		Blood in stool	0	0%	2	2%	94	98%
		Cramping pain in abdomen	0	0%	10	10%	90	90%

This part of the section describes the symptoms of occupational health problem among mining workers. Structured rating scale was given to mining workers in which they have to give response in always, sometime and never. The data was analysed by using frequency and percent distribution.

Section – III Finding related to evaluation of planned teaching program on prevention and management of occupational health problem in term of knowledge among mining workers

Table no – 3Frequency and Percentage distribution of pre-test and post-test knowledge score of the mining workers
(N = 100)

KNOWLEDGE SCORECATEGORIES	PRE-TEST		POSTTEST	
	FREQUENCY	%	FREQUENCY	%
POOR(0-5)	0	0 %	0	0%
AVERAGE(6- 10)	70	70%	5	5%
GOOD(11-15)	30	30%	40	40%
EXCELLENT(16-20)	0	0%	55	55%

MAXIMUM POSSIBLE SCORE =20

Table 4: Mean, Mean difference, Standard deviation, Standard deviation difference, standard error of mean, "t" value obtained and "t" value from table. (N = 100)

S.NO	KNOWLEDGETEST	MEAN	SD	MEANDIFFERENCE	SDd	SEMD	"t"value
1	PRE-TEST	9.05	2.03	6.6	0.37	0.59	20.14
2	POST-TEST	15.65	1.66				
"t" valuefordf (99)level =1.98,significant at0.05 level							

The data presented in table no 4 show that the mean post test score is (15.65) is higher than the mean pr- test knowledge score (9.05) with a mean difference of(6.6). The calculated "t" value (20.14) is higher than the table (1.98) for the df 99 and it was found statistically significant at 0.05 level of significant. The shows that the planned teaching program was effective in enhancing knowledge of Mining workers regarding prevention and management occupational health problem in mining workers.

Section – IV Finding related to effectiveness of planned teaching programme on prevention and management of occupational health problem among mining workers in term of practice.

Table no – 5: Frequency and Percentage distribution of pre-test and post-test and practice score of mining workers according scoring criterion (N = 100)

PRACTICESCORECATEGORIES	PRE-TEST		POSTTEST	
	FREQUENCY	PERCENTAGE	FREQUENCY	PERCENTAGE
POOR(20-30)	30	30 %	0	0%
AVERAGE(31-40)	65	65%	10	10%
GOOD(41-50)	5	5%	40	40%
EXCELLENT(51-60)	0	0%	50	50%

Maximum Possible Score: 60

Table no –6: Mean, Mean difference, Standard deviation, standard deviation difference, standard error of mean and "t" value obtained of pre and post-test practice score.

PRACTICETEST	MEAN	SD	MEANDIFFERENCE	SDD	SEMD	"t"value
PRE-TEST	20.65	4.12	29.75	2.73	1.4	16.55
POST-TEST	50.40	6.85				
"t"valueofdf(99)level =1.98,significantat0.05level						

The data presented in table no - 6 shows that the mean post-test practice scores (50.40) was higher than the mean pre-test practice score (20.65) with a mean difference of (29.75) The calculated "t" value (16.55) is higher than the table "t" value (1.98) for df 99 and it was found statistically significant at 0.05 level of significance. The shows that the planned teaching program was effective in enhancing the practice of mining workers regarding prevention and management of occupational health problem In mining workers.

Section – V Finding related to relationship between post-test knowledge and post-test practice score on prevention and management of occupational health problem

Table no – 7: The Mean, Standard deviation and Karl Pearson coefficient of correlation between post- test knowledge and post-test practice score of mining workers (N = 100)

VARIABLE	MEAN	SD	"r"
POST-TESTKNOWLEDGESCORE	15.65	1.66	0.45
POST -TESTPRACTICESCORE	50.40	6.85	
Significantat0.05levelofsignificanceatdf(98)"r"=0.19			

The data presented in table no 7 shows that there was a positive correlation between the post-test knowledge score and post-test practice score on prevention management of occupational health problem which is found more than the table value (0.19) for the df 98 at 0.05 level.

Section VI - Finding related to association between post-test knowledge score of mining workers and selected variables. The computed chi-square value between the selected variable and knowledge score of the KCC mining workers. The computed chi-square value of selected variable like age (3.23), educational qualification (2.85),Total year of experience a (2.63), were found to be statistically non-significant and monthly family income (6.89) was found statistically significant at 0.05 level of significance.

Section VII - Finding related to association between post-test practice score of mining workers and selected variables. The computed chi-square value between the selected variable and practice score of the KCC mining workers. The computed chi-square value of selected variable like age (4.007), educational qualification (4.37),and year of experience (3.96), were found to be statistically non-significant, monthly family income non-significant (0.05 level of significance

VII. CONCLUSION

Maximum mining workers were having the respiratory problem like asthma and hearing problem, vision impairment and heat stroke. During physical health assessment workers were found overweight. underweight and abnormal random blood glucose. System wise assessment reveled that the workers were having problems like runny nose, sore throat, nausea and dry cracked skin. Mining workers were deficit in terms of knowledge and practice regarding the prevention and management of occupational health problems. The planned teaching programme was effective in improving knowledge and practice of mining workers regarding prevention and management of occupational health problem.

There was a positive correlation between post-test knowledge score and post-test practice score of mining workers regarding prevention and management occupational health problem, which shows that as the knowledge scores increases, the practice also gets increased. The knowledge score and practice score of mining worker is associated with monthly income.

Implications

The findings of the study have certain important implications for the nursing profession in the field of Nursing Practice, Nursing Education, Nursing Administration, Nursing Research and Community Health Nursing.

Nursing Administration
- The administration should conduct the in-service education regarding the occupational health problems and its prevention and management.
- Nursing administrators should encourage the workers to participate in the diagnostic camp conducted by various states.
- This study can contribute to the field of nursing administration as planning, assigning, directing and performing nursing care regarding occupational problem.

Nursing Education

The Planned teaching program can be utilized by the nursing students to create awareness among workers about different occupational health hazards. The nursing students should be made aware of their role in occupational health nursing in health promotion and disease prevention in the present.

Nursing Practice

Regular health check-up should be emphasized by the public health nurse in the industry / plant as well as in the community even in the absence of occupational health problem. Communication and enforcement of the changed guideline on safety during work. Participate in health surveillance program that includes the assessment and recording of the health status of employees.

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DOI: 10.48175/IJARSCT-10039

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ISSN
2581-9429
IJARSCT

Nursing Research

Research needs to be conducted more in this area to ensure evidenced based practice.Nurse researchers should develop a body of knowledge, test the various strategies, and bring new finding related to occupational health problems. Very few researches have been done by nurses to assess the workers preparedness regarding occupational health problems. So emphasis should be made to have occupational health nurses in industries and publications of the finding of research on occupational health problems and its prevention in various journals and text books to disseminate the research base evidence for nurse practitioners.

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