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EDITORIAL

Disaster and its Challenges in Nepal

Nepal is a small and land locked country in South Asia. It is situated between the two large and densely populated countries of Asia - China in the North and India in the South, East and West. The shape of Nepal is rectangular and it has an area of 147, 181 sq. kms. The length (East to West) is 885 kms. and the width (North to South) is non-uniform, approximately 193 kms. It is situated between longitudes 80°4'E to 88°12'E and latitudes 26°22'N to 30° 27'N, along the Southern slopes of the Himalayas (snow peaks). Within the narrow breadth of the country, all varieties of climate and topography can be found ranging from the sub-tropical to the alpine. The lowest altitude starts from 60 meters above the sea level in the Southern plain to 8, 848 meters in the Northern part. Mt. Everest the highest peak in the world with an altitude of 8,848 meters lies in Nepal. Ecologically, the country is divided into three regions namely; *the Terai, the Hills* and *the Mountains*.

Nepal is located in the seismically vulnerable area where an Indian Plain is slipping into the Tibetan Plate. According to seismic and disaster vulnerability study, Nepal is in 11th in Earthquake and 30th in the flood hazardous country in the world. Geophysicists have studied that major earthquake which hit in the last fifty years were in the same seismic boundary line. Nepal also falls on the same seismic boundary lines. Similarly, in terms of number of disaster and losses it is in the 28th position in the World. Therefore, country like Nepal has a daunting task to be done in order to mitigate the losses and cultivate better prepared system in place. Mainly, disaster is divided into natural and manmade (including biological) disaster. Under the purview of disaster management cycle, the floods, earthquake, landslides, cyclone including hurricane, avalanche and glacier lake outburst flood are natural disasters, whereas air accident, surface (road) accident, fire, epidemic, nuclear

winter season, fire and avalanche in the pre-monsoon season are the seasonal common epidemiological hazards for a country. In order to minimize the loss and respond quickly and orderly, the coordination mechanism is essential for the preparedness, response, recovery and reconstruction phase.

Disaster is so unexpected and sudden that it causes great loss of lives, physical properties and environment. The cost and loss is so immense that single country encounters lots of challenges to manage. Especially its effect is more in the least developed countries than the developed countries. For instance, earthquake of 1934 A.D., 1980 A.D.1988 A.D , the flood of July, 1993 A.D, Koshi Flood in Nepal in 2008 A.D are the most devastating disasters which not only caused heavy losses of human lives and physical property but also adversely affected the development process of the country as a whole.

Disaster management is a difficult task and a challenge to developing countries like Nepal. Disaster happens all of a sudden. Thus, the suddenness of a disaster and its destruction, especially during a very serious natural disaster, it becomes very difficult to cope with a normal administrative set up and limited funds and resources. In view of the above situation Nepal is facing a number of severe problems like : poor public awareness, low literacy rate, mass poverty, fatalistic nature of some people, difficult and undeveloped physical infrastructure, unplanned settlement, lack of political commitment, slow decision making process and so on. Apart from the above the lack of cooperation and coordination among various disaster management related agencies and their behavior indifference, duplication of relief works, inadequate funds and resources and the lack of modern technology especially early warning system have made the disaster situation more complex.

It is a great challenge to protect infrastructure and property from frequent landslide and floods. Each year flood, landslide, fire, epidemics, avalanche and various other natural and man-made disasters cause the casualty of thousands of human lives and destruction of physical property worth billions of rupees. Thus, the country has been found to be a disaster prone country. Various factors like:

rugged and fragile geophysical structure, very high relief, high angle of slopes, complex geology, variable climatic conditions, active tectonic processes, unplanned settlement, dense and increasing population, poor economic condition and low literacy rate have made Nepal vulnerable to natural disasters. Most part of the country is seismically active. Hence, the geomorphology is very fragile. The constant tectonic action of different degree along with varied intensity of weather action, has adverse effect on stability of earth surface and river course. The physiography of earth is changing slowly due to its own tectonic action and universal planetary action. Such activities are more pronounced in Asia (Oceania) and South America. Among them all Himalayan region and some pocket of Oceania are most active. Major part of Himalaya lies in Nepal which is the grace of God and sometimes curse. Thus, the Himalayan region of Nepal can be considered as one of the severest flood hazard zone of the world. Heavy precipitation, high wetness and steepness of watersheds and river channels contribute to flood magnitudes.

Geographical variations , lack of tools and techniques, less public awareness , improper implementation of policies to respond disaster are some of the greatest challenges prevailing in Nepal. Not only in Nepal, natural disasters happen almost all over the world all of a sudden causing heavy loss of human life, destruction of infrastructure and property. Usually natural disasters can not be stopped, but the magnitude of disasters can be reduced if preventive measures be taken for which pragmatic government policies and public awareness are of utmost importance.

ORIGINAL ARTICLE

Prevalence of Depression among Certificate Level Nursing Students of Chitwan District, Nepal

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ABSTRACT

Background: Depression has been recognized as a major morbidity among medical students and the various factors that have been seriously affected their academic performance and quality of life. It affects not only their health and academic achievement, but also has serious consequences as suicide. The magnitude of depression among them is also high. So, the aim of the study was to assess the prevalence of depression among Certificate Level Nursing Students and major factors associated it.

Methodology: A cross sectional study was conducted among the nursing students of Balkumari College Chitwan, Nepal. Random sampling method was used to select the college and all students from first to third years were involved in the study. A self administered questionnaire was used to collect the data. A validated Beck Depression Inventory tool was used for determining the level of depression. The level of depression was also classified as minimal disturbances, mild depression, moderate depression and severe depression on the basis of the scores obtained in Beck Depression Inventory tools. The right and confidentiality of the respondent was maintained throughout the research and written consent was taken before the interview.

Results: This study revealed that 69.2% of the nursing students were found to be depressed, 40% of them had mild depression, 11.7% moderate and 17% severe depression. There seems a decreasing trend of severe depression from first year to third year, i.e. 42.9% during the first year, 38.1% the second year and 19% the third year. The prevalence of depression was not found significantly associated with years of nursing and interest in learning nursing courses.

Conclusion: The study reveals that there is a high prevalence of depression among the nursing students. Mostly first year nursing students were found to be depressed compared with the students of another year's. Hence, attempts should be made to alleviate the stressors right from the time they join nursing school.

Key Words: Depression, nursing students, Prevalence

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IINTRODUCTION

Depression is a mental disorder where the affected person experiences depressed mood, loss of interest and enjoyment and reduced energy leading to diminished activity for at least 2 weeks. As people with depression also suffer from somatic disorder, they have difficulty in carrying out their usual tasks such as school work, domestic and social activities.[1]

It is a well-recognized fact that the prevalence rates for mental illness in the communities of Nepal, as well as in other countries, show that about 20% of the general population suffers from mental illnesses at any point of time.[2] It is found that 154 million people suffer from depression and 25 million people from schizophrenia; 91 million people are affected by alcohol use disorders and 15 million by drug use disorders globally.[3] According to the precipitation of the World Health Organization (WHO), depression is estimated to become the second leading cause of dysfunction by the year 2020.[4]

It is estimated that there are more than 1,000 college –based suicide every year and that one in every 12 college students has made a clear plan to attempt or to commit suicide. The listed risk factors for college students consist of diagnostic criteria for clinical depression, including sadness, hopelessness, despair and stress.[5]

Undergraduate medical students are known to be the victims of tremendous mental stress. In recent years, depression has been recognized as a major morbidity in medical schools and the various factors affecting seriously to their academic performance and quality of life has been appreciated. However, only few studies are done in medical schools of Nepal. It is important for medical educators know the magnitude of depression in students and factors causing them, which not only affect their health and academic achievement but also has serious consequences as suicide.[6]

Thus we carried out 21 questionnaires based Beck Depression Inventory tools[7] to find out the prevalence of depression among the nursing students with the following objectives

METHODS

A cross sectional descriptive study was conducted at Balkumari Nursing college in Chitwan, Nepal during the period of February to June 2013. The college was randomly selected from the list of Nursing Colleges prevailing at the Bharatpur Municipality of Chitwan District. A total of 120 students, i.e. all the students of Balkumari Nursing College were included in the study. A self administered questionnaire was used as a method for data collection. Beck Depression Inventory which was validated in Nepal was used for assessing the level of depression among nursing students. The selected students were informed about the purpose of study and explained about the general instructions. Informed consent was taken prior to the

study. The students were allowed to respond in their own time and privacy. The participation was entirely voluntary. Then they were given the questionnaires which comprised of socioeconomic information and Beck Depression Inventory questionnaire.

Socioeconomic Information: This section had included age, family monthly income, interest of reading nursing and marital status.

Beck Depression Inventory Scale: The Beck Depression Inventory (BDI) is a 21-question multiple-choice self-report inventory which also has been validated in Nepali language. It is one of the most widely used instruments for measuring the severity of depression. The questionnaire is designed for individuals aged 13 and over, and is composed of items relating to symptoms of depression such as hopelessness and irritability, cognitions such as guilt or feelings of being punished, as well as physical symptoms such as fatigue, weight loss, and lack of interest in sex. Answers thus obtained are scored between zero to three for each question with a total score ranging from 0 to 63 (16-17). The level of depression based on the Nepalese version of Beck Depression Inventory-II was as follows:

0 - 9	Minimal disturbances
10- 18	Mild depression
19- 29	Moderate Depression
30- 63	Severe Depression

Data were entered into Microsoft excel and analyzed using SPSS version 16.0 statistical software. The prevalence of an outcome variable along with 95 percent confidence interval was calculated. The parametric data were analyzed using mean, standard deviation and percentages while the non- parametric data were analyzed using chi square tests.

RESULTS

Out of 120 respondents, 40 from each of the first, second and third year students. The majority of the respondents (85%) were of age group 15-20 years. Socio-demographic characteristic (Table 1).

Table 1: Socio-demographic characteristic

Variables	Frequency	Percentage
Age (Years)		
15-20	102	85.0
20-25	14	11.7
> 25	4	3.3
Marital status		
Married	11	9.2
Unmarried	109	90.8
No. of Family members		
< 5	67	55.8
5-10	52	43.3
≥ 10	1	0.8
Annual income of family (Rupees)		
< 30,000	30	25.0
30,000- 60,000	33	27.0
60,000 - 90,000	15	12.5
≥90,000	42	35.0
Interest of study		
Self	109	90.8
Family pressure	6	5.0
Imitating others	5	4.2

The overall prevalence of depression was found to be 69.2% as presented in Table 2.

Table 2: Prevalence of level of depression

Level of depression	Frequency	Percentage
Normal	37	30.8
Mild Depression	48	40.0
Moderate Depression	14	11.7
Severe depression	21	17.5

Mild depression accounts for 40%, followed by 17.5% severely depressed (Table 3).

Table 3: Prevalence of level of depression and year of course

Years of course	Depression level			
	Normal No. (%)	Mild depression No. (%)	Moderate depression No. (%)	Severe depression No. (%)
1st year	7(17.5)	20(50.0)	4(10.0)	9(22.5)
2nd year	16(40.0)	12(30.0)	4(10.0)	8(20.0)
3rd year	14(30.8)	16(40.0)	6(11.7)	4(17.5)

Severe depression was high among first year students following the decreasing trend with increase in years of course. The prevalence of depression was not associated with the interest of learning the nursing course and years of the students enrolling.

DISCUSSION

The results of this study show that more than two third (69.2%) of nursing students have any sort of depression. This figure is relatively higher than the value reported in a study conducted among Nursing Students of Shiraz University of Medical Sciences [4] and also on the study conducted by Paul Ratanasiripong in Thiland, i.e. 47%. On the other hand the report of Behdani et al. shows that 75% of students have depression (Depression in Nursing Students of Shiraz University of Medical Sciences). This may be due to the difference in tools used for diagnosing the depression.

This study reveals that two fifth of the students had the mild depression followed by 17.5% severe depression and 11.7% moderate depression. The figure seems relatively higher than the values reported in the previous study conducted on Nursing Students of Shiraz University of Medical Sciences .[8] Moreover the prevalence of depression had been higher in first year students (39.8%) compared with the students of others years' students. This result was similar to the study conducted for undergraduate medical students of BPKHIS where the prevalence of depression among first year and third year students were 32.43% and 28.07% respectively .[6]

CONCLUSION

The study reflects the clear picture of the prevalence of depression among the nursing students which is predominantly exist in first year and decreased with increasing the years of course. There don't seem sta-

tistically significant association between the level of depression and interest of studying nursing and other socioeconomic determinants.

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ORIGINAL ARTICLE

The effect of 'Chaitanya Prazolam' meditation techniques on selected Neuro-psychiatric ailments among the patients attending in Unique Meditation Center, Kathmandu

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ABSTRACT

Introduction: There is an enormous selfishness present in human beings which leads to all kinds of miseries and ills in society. [1] Mental, and neurological (MN) disorders are linked in a complex way with many other health conditions. Neuro-psychiatric ailments are present in the majority of the population, but these problems remain in hidden stage due to existing stigma in the Nepalese society. Medication (a mental exercise based on Vedic Mantras) treatment of anxiety is an effective generally safe and effective and is often used in conjunction with therapy.

Methods: Quasi-Experimental study was carried out among the patients with Neuro-psychiatric problems visited in Unique Meditation Center, Kathmandu. Total 107 participants were selected by probability purposive sampling technique. Pre and post test data were collected by face to face interview using a pre-tested structured questionnaire (based on Hamilton Anxiety Rating Scale of 0-4 score) after taking the ethical clearance from Nepal Health Research Council (NHRC). The data were analyzed using appropriate statistical tools in SPSS-20. Effectiveness of the treatment outcome was measured in good, moderate and poor categories with a level of significance $p< 0.05$.

Results: Total 107 participants (71% male and 29% female) having age range 16 to 84 (Mean ± SD: 36.4 ±11. 6 years) were involved in the study. More than half (57 %) of the participants were found to be felt severe anxiety problems before intervention which was reduced to 20.6 % after meditation. There was found a significant improvement on all types of anxiety problems like Anxious mode (t=51.06, P=0.001), Tension faced (t=38.67,P=0.001), Fear faced (t=36.07, P=0.001), Insomnia faced (t=19.47, P=0.001), Intellectual problem (t=28.19, P=0.001), Depressed mood (t=40.62, P=0.001), Somatic Muscular problems (t=33.89, P=0.001), Somatic sensory problem (t=31.36, P=0.001), Cardiovascular problems(t=24.26, P=0.001), Respiratory symptoms (t=37.32, P=0.001), Gastrointestinal problems (t=21.23, p=0.001), Genitourinary symptoms (t=23.11, P=0.001) and autonomic symptoms (t=19.47, P=0.001). About 76.0% were found to be felt the good effect of meditation technique.

Conclusion: Nearly three- fifth (57 %) of the participants were found to be felt severe anxiety problems before intervention which was reduced to 20.6 % after meditation. A significant improvement (76 % felt better effect) was found in all types of anxiety problems due to meditation. Different types of meditation techniques in scientific and systematic manner might be effective to reduce the mental health problems like anxiety disorder in Nepal. Hence, meditation centres are needed to be expanded throughout the country as an alternative medicine.

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INTRODUCTION

Today in this world all around, we find suffering, pain, disorders, war, disharmony, distrust, and feeling of insecurity, frustration, stress and conflict galore. There is an enormous selfishness present in human beings which leads to all kinds of miseries and ills in society. [1] Mental, and neurological (MN) disorders are linked in a complex way with many other health conditions. A large multi-country survey of WHO showed that 35–50% of serious cases in developed countries and 76–85% in less-developed countries.[2] In Nepal, the Neuro-psychiatric ailments are present in the majority of the population but these problems remain hidden because of the existing stigma and discrimination in the Nepalese society. It is estimated that in general population 1-2% of the population are suffering from Psychosis; 10% Neurosis; 4-6% depression; 1%, Seizure disorder; 3-5% and mental retardation; 3-5%.[10] Stress is a nonspecific response of the body caused by various stresses. Various studies conducted worldwide indicate that 75% of the general population are experiencing a stress.[4] Nowadays these problems are increasing among adolescent, adult and in old aged people and becoming a serious public health issue for the government.[3] Despite the burden of MN disorders are increasing, a large proportion of people with such problems are far from its treatment and care timely.[2]

Meditation is a mental exercise in which one directs one's mind to think inwardly by shutting one's sense organs to external stimulations. It is a Vedic exercise which can be used as a powerful instrument to restrain sense organs, control autonomic nervous system and also to attain super consciousness.[5] Medication treatment of anxiety is generally safe and effective and is often used in conjunction with therapy. Medication may be a short-term or long-term treatment option, depending on severity of symptoms, other medical conditions, and other individual circumstances. However, it often takes time and patience to find the drug that works best.[8] Simple and systematic meditation technique can reduce the hospitalization rate, financial resource etc. and improve health, memory, immunity etc. of the patients. Meditation practitioners display more relaxed physiological functioning, greater reduction in anxiety, and reduced tension when compared to control subjects. Hence, present study tried to assess the presence of different Neuro-psychiatric conditions like anxiety and depression among the people visiting the meditation center and their Improvement with the help of different meditation techniques.

MATERIAL AND METHODS

A quantitative type quasi-Experimental (pre-post test) study was carried out among the patients having Neuro-psychiatric problems visited in Unique Meditation Center, Sitapaila, Kathmandu for treatment (meditation). Non probability purposive sampling technique was applied to select the sample. All together 107 participants were selected using the statistical formula; $n= z^2pq/d^2$. Data was collected by face

to face interview using a pre-tested structured questionnaire on the basis of Hamilton Anxiety Rating Scale (HAM-A) for anxiety before after the intervention**.** The patient's report of anxiety related statements had scored on 0 to 4 according to the severity of the problems. Different phases of meditation 'Chaitanya Prazolam' of duration 2 to 4 weeks were applied according to the severity of the problems as intervention. Improvement of the problem was observed after each phase.

Ethical approval from Nepal Health Research Council (NHRC) and written informed consent was taken before starting the study. All the data were checked and rechecked for its accuracy and reliability before entering into the computer. The data were analyzed using statistical tools such as percentage, median, standard deviation (SD), z-test and chi-square test in the computer based software SPSS version 20. Effectiveness of the treatment outcome was measured in three categories; good (More than Mean + SD), moderate (in between mean ± SD) and poor (less than mean-SD). Level of significance was set in a p-value less than 0.05.

RESULTS

All together, there were 107 participants having the age range 16 to 84 years (Mean ± SD: 36.4 ±11.6). Amongst the total participants, 71 percent were male and 29 percent were female. About 80.4 percent were married and 37.4 percent were from nuclear families. Nearly two-thirds (65.4%) of the participants have children of which 57 percent male and 42 percent female. About 38.3 percent of the participants had got a higher education followed by 32.7 percent secondary, 20.6 percent higher secondary and 4.7 percent primary education. About 35.5 percent of the participants were service holder followed by a 25.2 percent business man, 14.8 percent were students, 10.3 percent were housewives, 6.6 were social workers, 2.8 percent farmers and 4.7 percent. About 60.7% of the participants were Brahmin/Chhetri followed by 34.6 percent Janjati, 2.8 percent Madhesi and 1.9 percent Dalit. About 45.8 percent of the participants had more than 30 thousand monthly family income followed by 26.2 percent have between 10001 to 20,000, 19.6 percent have 20001 to 30000 and 8.4 percent had less than ten thousand. (Table 1)

In overall, the study revealed that more than half (57 %) of the participants were found to be felt severe anxiety problems before intervention which was reduced to 20.6 percent after meditation. Similarly, 35.5 percent and 7.5 percent of the participants had moderate and mild type of anxiety problems before mediation which was modified to 2.8 percent and 76.6 percent respectively after treatment. (Table 2)

Table 1: Demographic features of the participants

Characteristics		Frequency	Percentage
Age of the participants	20 and less	4	3.7
	21-30	35	32.7
	31-40	37	34.6
	41-50	20	18.7
	51-60	5	4.7
	60 and more	6	5.6
	(Mean ± SD:36.4 ±11.6 years)		
Sex of the participants	Male	76	71.0
	Female	31	29.0
Marital status	Married	86	80.4
	Unmarried	21	19.6
Family type	Nuclear	40	37.4
	Joint	67	62.6
Having children	Yes	70	65.4
	No	37	34.6
Sex of children	Male	61	57.0
	Female	45	42.0
Education of the participants	Illiterate	4	3.7
	Primary	5	4.7
	Secondary	35	32.7
	Higher secondary	22	20.6
	Higher education	41	38.3
Occupation of the participants	Service	38	35.5
	Agriculture	3	2.8
	Business	27	25.2
	Housewife	11	10.3
	Students	16	14.9
	Social work	7	6.6
	Others	5	4.7
Ethnicity of the participants	Brahmin/chhetri	65	60.7
	Janajati	37	34.6
	Madhesi	3	2.8
	Dalit	2	1.9
Monthly family income of the participants	Ten thousand and less	9	8.4
	10001-20000	28	26.2
	20001-30000	21	19.6
	More than 30 thousand	49	45.8

Table 2: Anxiety level status before and after meditation

Severity of problems (According to score)	Before intervention		After intervention	
	Frequency	Percent	Frequency	Percent
Mild (17 and less)	8	7.5	82	76.6
Moderate (18-24)	38	35.5	3	2.8
Severe (25 and more)	61	57.0	22	20.6
Total	107	100.0	107	100.0

Student t test was applied to observe the impact of the meditation on anxiety problems. The study showed the significant improvement on all types of anxiety problems like Anxious mode (t=51.06, df=106, P=0.001), Tension faced (t=38.67, df=106, P=0.001), Fear faced (t=36.07, df=106, P=0.001), Insomnia faced (t=19.47, df=106, P=0.001), Intellectual problem (t=28.19, df=106, P=0.001), Depressed mood (t=40.62, df=106, P=0.001), Somatic Muscular problems (t=33.89, df=106, P=0.001), Somatic sensory problem (t=31.36, df=106, P=0.001), Cardiovascular problems(t=24.26, df=106, P=0.001), Respiratory symptoms (t=37.32, df=106, P=0.001), Gastrointestinal problems (t=21.23, df=106, p=0.001), Genitourinary symptoms (t=23.11, df=106, P=0.001), Autonomic symptoms (t=19.47, df=106, P=0.001), Observed behavior (t=33.89, df=106, P=0.001).

Variables	Frequency	Percentage
Age (Years)		
15-20	102	85.0
20-25	14	11.7
Marital status		
Married	11	9.2
Unmarried	109	90.8
No. of Family members		
< 5	67	55.8
5-10	52	43.3
Annual income of family (Rupees)		
< 30,000	30	25.0
30,000- 60,000	33	27.5
60,000 - 90,000	15	12.5
> 90,000	42	35.0

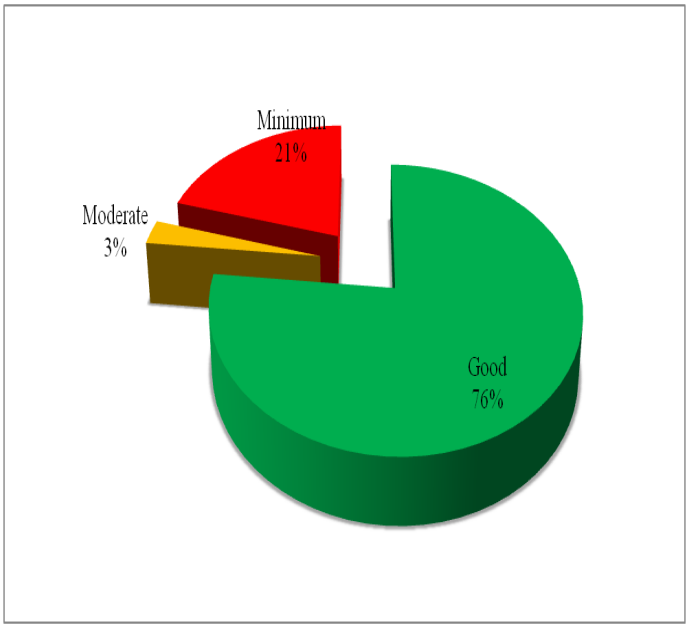
Table 3: Impact of mediation on anxiety problems

An anxiety problem	Paired Differences before and after treatment					T value	df	P value
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Anxious mode	1.047	0.212	0.020	1.006	1.087	51.061	106	0.001
Tension faced	1.093	0.292	0.028	1.037	1.150	38.677	106	0.001
Fear faced	1.084	0.311	0.030	1.025	1.144	36.075	106	0.001
Insomnia faced	1.047	0.556	0.054	0.94	1.153	19.474	106	0.001
Intellectual problem	1.093	0.401	0.039	1.017	1.17	28.190	106	0.001
Depressed mood	1.056	0.269	0.026	1.005	1.108	40.628	106	0.001
Somatic Muscular problems	1.075	0.328	0.032	1.012	1.138	33.898	106	0.001
Somatic sensory problem	1.187	0.392	0.038	1.112	1.262	31.346	106	0.001
Cardiovascular problems	1.280	0.546	0.053	1.176	1.385	24.261	106	0.001
Respiratory symptoms	1.075	.298	0.029	1.018	1.132	37.329	106	0.001
Gastrointestinal problems	1.028	0.290	0.028	.972	1.084	36.667	106	0.001
Genitourinory symptoms	0.935	0.418	0.040	.854	1.015	23.114	106	0.001
Autonomic symptoms	1.299	0.633	0.061	1.178	1.420	21.239	106	0.001
Observed behavior	1.075	0.328	0.032	1.012	1.138	33.898	106	0.001

Cumulative effect of meditation on anxiety

On the basis of improvement on anxiety problems faced by the participants, the study showed that, more than three quarters (76.0 %) were found to be felt the good effect of meditation technique, whereas three percent felt it as moderate and 21 percent felt the less effectiveness (Figure 1)

Figure 1: Effectiveness of meditation



DISCUSSION

On the basis of improvement on anxiety problems faced by the participants, our study showed that, more than three quarters (76 %) of the participants had the good effect of meditation, whereas three percent felt it as moderate and 21 percent felt the less effect (Figure 2). The meditation showed the significant reduction on various types of anxiety problems like anxious mode (t=51.06, P=0.001), tension (t=38.67, P=0.001), fear (t=36.07, P=0.001) and insomnia (t=19.47, P=0.001) .This finding was consistent with various studies of similar findings for termed meditation (TM) techniques.[12-16] Significant improvement on mental health was resulted from yoga practices (mind-body training program) in community based settings [12] and from TM like Transcendental meditation among selected adult populations.[13, 14] Studies in USA and Vietnam, demonstrating the effect of TM on mental distress in experimental settings showed the significant reduction at mental distress level of study participants.[15, 16] Systematic reviews with larger numbers of studies suggested that TM to be markedly more effective than other meditation and relaxation therapies. [18, 19]

The present study revealed that the meditation had significant impact on reducing the Intellectual problem (t=28.19, P=0.001), Depressed mood (t=40.62, P=0.001), Somatic Muscular problems (t=33.89, P=0.001), Somatic sensory problem (t=31.36, P=0.001), and autonomic symptoms (t=19.47, P=0.001) which is in-line with various similar studies from in India and abroad.[21-23] Krygier J. and Kemp A. argued that if we can demonstrate the efficacy of intensive meditation on emotion regulation, and characterize those who will benefit most, we will have established a significant role for meditation in improving mental and physical health.[21] An experimental study (based on three months training) report published in PLoS Biol 5: e138 suggested that meditation causes significant improvement in the executive attention network among the experimental group.[22]

The integrative body–mind training (IBMT) is an easy, effective way for improvement in self-regulation in cognition, emotion, and social behaviour. Our study is consistent with the idea that attention, affective processes, and the quality of moment-to-moment awareness are flexible skills that can be trained. [24, 25] Furthermore, our study is completely supported by a study conducted in Chaina on Short-term meditation training improves attention and self-regulation. [26] Present study furthermore, revealed that Cardiovascular problems (t=24.26, P=0.001), Respiratory symptoms (t=37.32, p=0.001), Gastrointestinal problems (t=21.23, P=0.001), and Genitourinary symptoms (t=23.11, df=106, P=0.001), were directly affected by the meditation used which was in-line with the study conducted in Hubli India and others.[27-28] Study conducted in Hubli, showed that there was statistically significant (P<0.01) increase in Tidal Volume after twelve weeks of meditation practices. Studies show that Meditative practices are associated with slow and deep type of breathing. Hence respiratory rate decreases, but there is an increase in Tidal Volume.[27] Similarly breathing pattern observed by spirometry also supports this observation reported decrease in the Minute Ventilation, Tidal Volume and changes in breathing.[28]

This study was supported by another study conducted in, Harvard Medical School in 1970s. [(9)] Cardiologist Herbert Benson found that even a very simple form of meditation, produced sustained physiological benefits such as reduced heart, metabolic and breathing rates.

Meditation slows the heart rate via signals that travel down the vagus nerve. Those same signals, Tracey speculates, may also dampen the immune response, making it possible for people to ease the symptoms of inflammatory diseases through exercises such as meditation and yoga. In this study subjects were measured for changes in breathing rate, blood pressure and cholesterol levels during the practice of meditation. Breath rate fell from 14 breaths per minute to about 11 breaths per minute, indicating meditation produces a state of rest and relaxation. The change in breath rate is natural, effortless, and comfortable.

CONCLUSION

After 2-4 weeks meditation practice, there was significant reduction in Anxiety problems. Anxiety problem is a hyper metabolic physiological state associated with increased heart rate, blood pressure, respiratory rate, oxygen consumption and blood flow. Meditation which is a wakeful hypo metabolic state associated with greater alertness and causes significant reduction in different type of Neuro-Psychiatric ailments. Most of our observations are attributable either entirely or largely to induction of a hypo metabolic state / relaxation response by meditation. Hence this study was undertaken to find out the effect of meditation in Neuro-Psychiatric ailments like stress reduction, respiratory problems, circulatory problems, genitourinary problems and memory problems. Different types of meditation techniques in scientific and

systematic manner might be effective to reduce the mental health problems like anxiety disorder in the developing countries like Nepal. Meditation centers are needed to be expanded throughout the country as alternative medicine considering accessibility and affordability of community people.

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ORIGINAL ARTICLE

Study on Chhaupadi Partha: Socio-cultural Violence against Women in the Far- Western Region of Nepal

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ABSTRACT

Background

The concepts of human rights, reproductive rights and women's rights have been expanded towards women's issues. This debate has become pertinent owing to the fact that women are still being exploited in the form of social-cultural practices and rigid ge---nder roles. For instance, menstruation is a normal physiological of women, in spite of this, socio-cultural violence is evident through the practice of C*hhaupadiPratha* in Nepal. The aim of this study was to identify the socio-cultural practices towards the Chhaupadi Pratha and explore what forms of violence women have gone through.

Methods

A cross sectional descriptive study was carried out among reproductive age group women residing in far-western region of Nepal applying the mix method (Face to face interview for quantitative data and Focus Group Discussion and in-depth interview for qualitative data).

Results

Women are perceived impure and polluted during the menstruation and they are segregated in a separate place away from home called '*Chaupadi Gotha'* which is unhygienic and insecure. They are not permitted to take care of their personal hygiene, nutritional food and living conditions, but are forced to do hard physical work outside the house. They are treated as untouchables and kept outside from their houses and other family members to maintain purity of humans, trees, animals, homes, and public water sources, public and religious places. They are not caring by another family member even got ill.

Conclusion

Women are victimized in the form of *chhaupadipratha* due to sociocultural practice as a belief of menstruating women is 'impure' and 'polluted' and behave as inhumanness, untouchable, unhygienic condition result health and social problems face by women and children.

Key Words: Socio-cultural, Violence, *ChhaupadiPratha, Chuapadi Gotha,* Women's Health

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INTRODUCTION

Women are being equal partners and status within the family and play a vital role in socio-cultural and religious rituals. In spite of this, women are prone to different forms of violence such as physical, sexual, societal, ethnic, spiritual and psychological.Social discriminations include polygamy, child marriage and restriction in freedom, widowhood, subordination, prescribed gender role, marriage practice, Deiki (traditional practice of offering a youthful girl in Hindu temples), and Jhuma (traditional practice of offering a youthful girls in a Buddhist temple). They are subjected to the incessant exploitation, ill-treatment and prejudice in several aspects. Menstruation is a biological phenomenon where women have some physical and psychological sickness, [1]. The history of menstrual practice was started from hunter-gatherer societies, [2]. Since earlier time, it was thought that menstrual period is a sacred and special period of women and in first time special celebration and ritual. Similarly, Dogon tribes in Africa, women stay in a special hut, [2]. They can simply ordered to do work for every male even the impolite man, [3].

Though the United Nation General Assembly declared that all types of discrimination related to gender must be eliminated, [4], gender-based discrimination and exploitation remains widespread in different ethno-cultural settings. Such kinds of exploitation can be observed more or less in almost all religion, [5–7]. Women were required to live separately from their house, [8–10]. Hinduism considers menstruating woman were "impure"[8,] and "polluted", [11–13]. With this background, this study intends to identify the socio-cultural practices towards the *ChhaupadiPratha*and explore what kinds of violence women experience during *ChaupadiPratha*and the problems that women face due to this practice.

MATERIALS AND METHODS

This study follows mix method. The cross-sectional approach was adopted in quantitative method, whereas descriptive approach was taken for the qualitative study. The research site was selected purposively where the *Chhaupadi Pratha* is in practice. The research area was a Sunkuda Village Development Committee (VDC) in Bajhang district. The adjoining districts of this VDC are Baitadi, Doti and Dadeldhura. Due to limited resources and financial constraints, the study area is a single village which consists four wards. The respondents were selected to represent the diverse community in such a way that it represented upper caste (Brahman, Kshetri, and Sanyasi) and the lower caste (Dalit). Face to face interview, observation and focus group discussions methods were applied to collect the data using appropriate tools like semi- structured questionnaire, interview schedule and focus group discussion guideline.

All together, 88 respondents were selected from the reproductive age group women for face to face interview whereas, three focus group discussions (8 to 10 participants in each group) and four in-depth inter-

views among the women who were directly involved in *Chhaupadi* Partha was carried out. Besides this, informal community leaders and key persons like elderly women were also included in FGD. Verbal Informed consent was taken before starting the data collection. Dignity and privacy was fully maintained according to the values and norms of the society during data collection. Data were analysed on the basis of quantitative and qualitative form separately using different statistical tools. Qualitative data were presented in narrative form whereas quantitative data were presented in tabular, graphical and narrative form where ever necessary.

RESULTS

Socio demographic profile

Out of the 88 participants, 36 percent were Brahmins, followed by Dalits 29 percent, Kshetris 27 percent and Sanyasis 8 percent. Regarding the occupation 85 percent were depended on agriculture, whereas 15 percent were service holder. Out of the service holders, three were doing jobs in private sector within the country and 10 (male family members) were working as migrant labourers in India. Regarding socioeconomic conditions, 75 percent were illiterate and 25 percent are literate. Similarly, 68.18 percent families had very low income, whereas 23.87 percent families had low income and 7.95 percent families had a medium level of income. (Table 1)

Table 1: Distribution of socio-economic profile of respondents (n=88)

Demographic Characteristics		Number	Percent
Level of Education	Illiterate	66	75
	Literate	22	25
Monthly income of family	Very low	60	68.18
	Low	21	23.87
	Medium	7	7.95
Ethnicity	Brahmin	32	36
	Kshetri	24	27
	Dalit	26	29
	Sanyasi	6	7
Occupation	Farmers	75	85
	Service holders	13	15

Family behaviour and ill practices during menstruation

Feeding and touching behaviour of family members and the community people during menstruation is found to be hurtful.

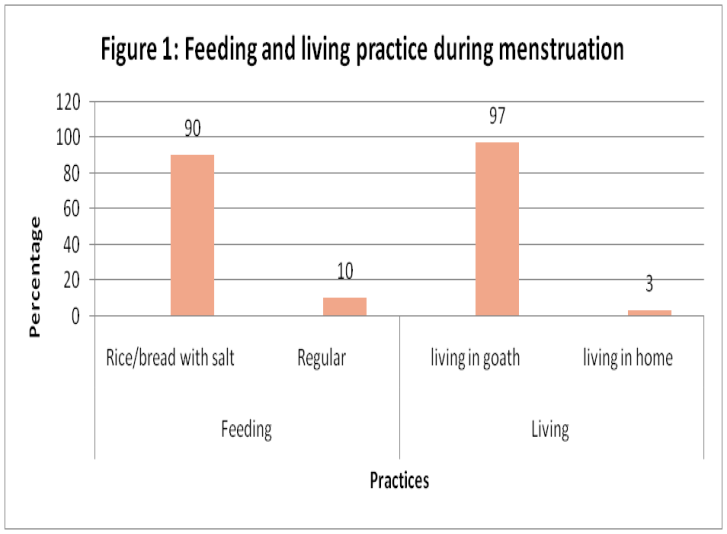

Figure 1:Feeding and living practice during menstruation

Similarly the study showed that 94.3 percent of the participants had no knowledge on menstrual and personal hygiene, and special care during menstruation period (table 2)

T able 2: Distribution of respondent according to knowledge on menstruation, personal hygiene, and special care during menstruation period

SN	Knowledge of RH (menstrual Hygiene,)	Number	Percent
1	No knowledge	83	94.3
2	Knowledge	5	5.7
	Total	88	100

The result of qualitative data showed that the women during menstruation were not allowed to touch large tree, animal, adult men and women. Similarly they were restricted to enter into kitchen, house, public place, and public water source. Furthermore they were not allowed to take milk and milk products and usual food. They have to live in unhygienic and unsecured place; the *Chhaupadi Gotha*, and force to do hard physical work outside the house. They have not allowed to touch her matured children, even they became ill or she became ill. They have not allowed taken their personal care and maintaining their hygiene. Similarly, their little child should live with them and they have also not allowed to enter the house without bathing even in winter season too. They complained that they were only purified after bath and drink *gahut* (urine of cow). In spite of this menstrual period woman always worried about their responsibilities. Dalit women were complaining that they face 'double untouchability' as they are considered 'untouchables' by upper castes and when they menstruate, they are further treated as 'untouchable' at home. However, they have some knowledge about this practice being restricted by the government now. Educated women complained that there are no any different in their physical structures, they are the same, so why do they have to suffer for these 4 - 11 days?

Perceived Social and personal health problems

Table 3 shows 62.55 percent women were found to be terrible of theft and different injuries during living in the *chhaupadi goath.*

Table 3: Perception of respondent in social and health problems due to *chhaupadipratha. (n=88)*

Perceived problems		Number	Percent
Social problems	Fear of thief and injury	55	62.5
	Fear of child ill	49	55.68
	Worry on household chores	45	51.13
	Fear of Sexual abuse and Rape	11	12.5
Perceived Health Problems	Excessive bleeding followed	60	68.18
	Reproductive tract infection	46	52.27
	Pneumonia and body ache	30	34.00
	Prolapsed of Uterus	15	17.00
	Anaemia	10	11.36

Similarly about 55.68 percent were found to be worried about the health and caring of children, 51.13 percent were worried about household chores and 12.5 percent feared sexual abuse. Regarding the health problems during staying in the goath 68.18 percent experienced excessive bleeding, 52.27 percent suffered reproductive tract infection, 34 percent pneumonia and body ache and 17 percent had prolapsed of the uterus and 11.36 percent had anaemia. (table 3).

In qualitative results, most of the **r**espondents shared their initial experience about *chhaupadi Pratha* from the onset of menarche, and experienced several difficulties. They had to spend longer duration in the *Chhaupadi Gotha, which* lasted for 7 to 10 days. They were more comfortable in their natal home during the period, but in their marital home, they had to negotiate with their in-laws and follow strict rules. Women reported that they felt uneasy in the work place, in the house and on the streets because they feared that their contact might 'pollute' other people and things and if contacted by chance one has to go through the purification rituals. This was the reason that they suffered to act carefully so that they would not be termed as 'trouble makers'. Women in most cases experienced a sort of pressure and stress, which continued for the entire period of menstruation. In this situation, one 24-year female respondent shared her troubles:

Living in the Chhaupadi Gotha is very difficult; there is fear of animals, insects, and thieves; there is no security. Many a -times I didn't sleep a wink for the whole night. Once I heard that a menstruating female died due to snake bite near the village, I was very frightened. Besides that, I always dreaded what would happen if I touch a large plant, animal or man because they said that my impure touch would render everything useless and dead. I thank God it didn't happen with me.

They complained they were not cared for and endorsed by their household members even when they fell ill during menstruation.Similarly, they shared their ill health and injury and rude practice of family member and not care them in that period. Another 30-year-old Sanyasi woman told:

When I was in Chhaupadi Gothawith my child during the winter season, we became ill and I couldn't sleep properly. Both of us had high fever and cough. My mother in-law and husband did not care about me while they bathed my child in cold water to take him to the sub health post. He was later diagnosed with pneumonia. They cared for him, but nobody came to help me before the fourth day.

Respondents complained they were suffering from social crime and psychological stress. They feared about their safety and the safety of their ornaments. Women were afraid that on animals, insect, ill-intentioned and drunken men could come and harm them while they remained in the Chhaupadi Gotha. Equally, another 27-year-old Dalit woman told:

Living in Chhaupadi Gotha is a genuinely a difficult and terrifying experience. When I was in my parents' house, I saw a woman getting raped by her alcoholic

relative while she was sleeping in the Chhaupadi Gotha. Similarly, I had also seen a woman, who was wearing ornaments, being robbed and seriously injured. I always remember these two incidents when I go to live in the gotha.

Similarly, women shared about the effects on health and education and negative impact on the development of children due to this practice. Similarly, elderly women shared their experiences and their health problems they suffer at present, Female Community Health Volunteers and teachers shared their knowledge about the ritual and students shared their problems and effects of the ritual on their education in focal group discussion. Another elderly uneducated Dalit woman shared her health problems:

When I was in a Chhaupadi period after my second delivery, my health was *very weak. On the 12thday when I had gone to field with a heavy organic fertilizer load; I felt something protruding my lower abdomen. That was Ghado (prolapsed of uterus). I still have not solved these health problems. My husband neglected me since that time and my children also wanted to abandon me. My life has become horrible due to this problem. I feel ashamed and do not like to go to the public places. She was started weeping.*

Perceived behaviour of respondents on the Chhaudi Pratha

Table 4 shows 80.68 percent women were in favour of change existing practices during menstruation, whereas, 11.36 percent women suggested eliminating this practice completely and 7.95 percent were in favour of the continuation of the practices. Similarly, More than three quarter (77.27%) of the respondents expressed that they want to live within the house. About 68.18 percent were against heavy workload and 62.5 percent wanted to eat a normal diet during the time of menstruation (the respondents had more than one option to choose).

Table 4: Distribution of respondents according to perceived behaviour on *ChhaupadiPratha* and its practice

Perceived behaviour		Number	Percent
Require of change in CP	Partial change required	71	80.68
	Total change required	10	11.36
	No change require	7	7.95
Interest of participant during menstruation	Want to live in same home	68	77.27
	Want to change in heavy work load	60	68.18
	Want to change in dietary habit	55	62.5

Elderly women and social leaders shared their views about the social norms and values of this practice. They discussed, it is a religious practice, 'God gifted', practiced from ancient time and changing this practice is against religion. They believe menstrual blood pollutes house and other people, animals and trees. But young generation opposed this idea and

complained *ChhaupadiPratha* have not any scientific evidence only women and their children are suffering from physically, socially and psychologically. They believe that this kind of segregation badly affects the physical and psychological development of adolescent girls and women. They were opposed that the sin was not done by us why would we suffer from this.

Similarly, young, educated women shared their knowledge and experience about the physiology of menstruation and health problems due to this Pratha. Another 32-year old educated woman shared her understanding:

Poor hygiene, poor nutrition, heavy workload, poor sanitation, contaminated water & poor housing condition are not only affecting the reproductive health but are worsening the health problems of women. It also affects the health and nutritional condition of their children. We bear many health and social problems due to ChhaupadiPratha. The main problems are prolapsed uterus, pneumonia, body pain, depression, urinary tract infection, reproductive tract infection, rapes, snake or dog bite, bleeding, and diarrhoea. There are also many health problems of our children likediarrhoea, acute respiratory tract infection (ARI), pneumonia, malnutrition insect bite and injury. Why are we continuing this ritual when we see that it has created so many problems? Just about me; I lived in the own homes and ate the usual food during menstruation, but that did not affect our family and cattle. On the other hand our health and the health of our children is better than others.

Similarly, illiterate and old men were in favour of this practice and they argued that health hazards are not related to this practice, but occur due to the fate or sin of the past life *(purba janmako paap*) and the curse of God. Thus this pattern should be extended with some adjustment. Mostly young and educated respondents argued that it is a social- cultural violence and suggested that *Chhaupadi Pratha* should be eliminated. They also suggested that this practice can be eliminated by education, awareness campaign, poverty elimination and employment. They indicated that social leaders, teachers and activists could be the changing factors. Likewise, they argued that willpower of women is also obligatory.

DISCUSSION

Nepal Government and International agencies had introduced many activities towards the women's issues like health, women's rights, women empowerment and autonomy, reproductive rights and gender equity. Equally, different laws, guidelines and directives have been introduced in the public sector, whereas the Supreme Court has also passed a special order to be implemented by the Government for the elimination of *ChhaupadiPratha*, [9]. In spite of this, almost all of the women follow the C*hhaupadiPratha* and almost all (97%) live in *Chhaupadi Gotha* that has an insecure environment, poor sanitary condition, improper space to sleep, without proper ventilation, appropriate bed and blanket besides that educated, and employed and normal socio-economic status

women were living in their same home with regular food. Personal hygiene is also very poor because women are not allowed to bath before the fourth day, they cannot comb their hair, cannot wash their clothes until the fourth day. The finding isconsistent with the study in Tamil Nadu, India, [27]. Similarly, *Chhaupadiparatha* was practiced after delivery and postpartum period, but it is better than menstrual period.

Equally, the findings were maximum women (94.3%) had no knowledge about menstrual and personal hygiene. Food practice among majority of women (90%) had inadequate diet, consisting of only plain rice or bread with salt. Women were not allowed to have milk and milk products, pulses, green vegetables and pickle. The finding was near about similar in another study and documentary in Nepal and India[8,16]. Similarly, the finding of qualitative data women was considered "impure" or "polluted" and they are treated as 'untouchables' who are in *Chhaupadi Pratha*. Women suffer exploitation and are ostracized in all potential ways. Women are not allowed to enter the house, use a public water source, attend public gatherings and religious place and not allowed to cook, milk cows and buffalos. They have to avoid contact with adult men and women, large trees, cattle. Similarly, nobody can touch her during this period and even if she becomes ill nobody cares for her. The consistency of this finding was in the studies and books in Nepal, India and other parts of the world,[16–21] .Likewise, discrimination and gender base violence are present in this form; women had to do hard physical labour that was taking organic fertilizer to the field, collect fodder and firewood. Women had been taking care their small children by themselves. Children could enter into the house only after taking a bath. They learning were similarly in others study in Nepal, [22,23].

Furthermore, there was a heightened sense of fear among the respondents were feared from thief and injuries (63%), child health (56%), worried household chore (51%) and sexual abuse (13%). As a consequence of such kinds of malpractices, negatively affects the education of girls, health of children and women, death, and social crime like sexual abuse, assault and stealing. The learning was consistency in other study in far western and rural area in Nepal, [23,24] .

Among the respondents mostly young and educated women were in favour of change in this*Partha* (81%),and eliminating completely (11%), but old women and social leader were favour of continuation (8%). Women wanted changes in the practice of the *Pratha* were leave *Chhaupadi Gotha* and staying at home, reduced work load and to eat regular diet and maintain their hygiene. Likewise, it was found that, elderly women had forgotten their problems faced in the past and social leader, mostly men they do not face these problems and practice was ingrained in the community. Hence, it is really difficult to bring change in this practice, though they know this Pratha is an unhealthy pattern and has harmful effects on the society. They suggested that it can be changed only

through proper education directed towards social-cultural stigma and taboos, poverty elimination and women's employment and empowerment with male involvement. The findings of quantitative, qualitative and observation are interconnected. Women are exploited and victimized in the form of social-cultural norms and practices. This practice challenged in the achievement to the target of reproductive health and millennium development goal towards the health of women and children.

CONCLUSION

Although menstruation is a normal physiology of women, in social sphere menstruating woman is categorized as 'impure' and 'polluted' were victimized in the form of Chhaupadi Pratha.Equally they were treated as 'untouchables', restricted and were not permitted to run through basic daily affairs like cooking, cleaning, having physical contact with others but forced to do hard work in the field and animal husbandry. Women belonging to Dalit castes were more vulnerable and face more troubles. They were treated inhumanely and segregated from usual life and forced to live in unhygienic place known as *Chhaupadi Gotha* and follow lack of nutritious food. This practice not only deteriorates women's health, but also violates their basic rights and individual freedom and also put them at an increased risk of sexual crime and robbery and other risk.

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ORIGINAL ARTICLE

Particulate Pollution and Its Effect on Respiratory Symptoms of Exposed Personnel's in Three Heavy Traffic Cities , Kathmandu

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ABSTRACT

Background: The solid and liquid droplet present in air is called Particulate matter (PM) and the mass measure of Particulate Matteris called Total suspended particle (TSP). The respiratory symptoms refer to the self reported symptoms on respiratory problem that can lead to serious respiratory problem in future. The status of particulate pollution is supposed to be increased along with number of Respiratory symptoms. The present study was carried out to determine suspended particles and respirable particles of diameter less than 1 micrometers (PM1) on road side and some distance of outside from road; and to compare the respiratory symptoms between traffic police men and shop keepers directly exposed to traffic fumes and office worker stay in 'protected' enclosed environment.

Methods: Cross sectional study was carried out. The data was collected through semi structured questionnaire after getting verbal informed consent form the participant. Convenience sampling of participant was done. Forty five Traffic police and Shopkeeper working on road side was allocated as case and forty five officials working in different locations were allocated as control. The collected data was stored in MS-Excel 2003 and analyzed. The data on PM and TSP was collected through instrument Haz-Dust EPM5000.

Results: The result showed that the air quality of road side traffic is unhealthy and there was increasing trends of respiratory illness in hospital outpatient department (OPD). The people who were exposed found to have more risk of developing respiratory diseases symptoms. The odd ratio (OR) for case and control for pain or tightness in chest was 9.8, for shortness of breath 9.5 and for irritation in respiratory tract it was 3.3.

Conclusions: The present study concluded that air quality in Kathmandu is unhealthy for normal breathing. People working on road side are of greater risk of developing respiratory diseases.

Key words: Heavy traffic cities; Kathmandu; Particulate pollution; respiratory symptoms

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INTRODUCTION

Kathmandu is trade and commercial centre and the capital of Nepal. The population is increasing day by day. Vehicle emission is one of major source of air pollution and air quality is frequently less than WHO standard.[1]The criteria pollutants (Oxides of sulphur, nitrogen, and carbon) are well below the WHO standard for criteria air pollutant concentrations.[2]

Health effects on the exposed population of air pollution include breathing and respiratory problems, aggravation of existing respiratory and cardiovascular disease, alterations in the body defence systems against foreign materials, damage to lung tissue, carcinogenesis and premature death, prolonged exposure to dust can result in chronic bronchial problems.[3] The prevalence of obstructive, restrictive and mixed type of functional impairment of the lung was found to have direct relationship with the dust concentration and duration of exposure.[4]. Investigations of the respiratory health effects from Particulate pollution exposures are necessary in order to predict the risk factors that may cause respiratory problems[5].

METHODS

Total three traffic roads Singh Durbar, Koteswor and Satdobato of Kathmandu valley was selected for the study. A cross section study allocating participants as case-control study was conducted among 90 participants. Convenience sample of 45 Traffic police and shop keepers on road side was considered as case. Forty five Official from banks, private companies who are less exposed to the air pollution were selected as control group. The monthly income, age group and study areas were highly considered to take part in study. Those, who were already had developed respiratory diseases and under medication were excluded from the study. Semi-structured Respirator Medical Evaluation Questionnaire[6] was used to collect the data after obtaining the verbal informed consent. All the issues related to health research ethics were addressed. Records from different hospital in Kathmandu were also obtained, as per request of NAST; the data was used as reference data. The data on particulate matter was taken by using Haz Dust EPAM-5000. The ministry population and environment (MoPE) 2005 had categorized the air quality of Kathmandu as below and taken it as reference for air quality standard for PM10.[7]

Good≤60 $\mu g/m^3$, Moderate =61-120 $\mu g/m^3$, Unhealthy =121-350 $\mu g/m^3$, Very Unhealthy =351- 425 $\mu g/m^3$, Hazardous ≥ 425 $\mu g/m^3$

RESULTS

The Table 1 shows that satdobato area had highest TSP and PMQ along with its control area. Similarly, the Koteswor area was found to have second highest TSP and PM10 along with control area. The least was found for Singh Durbar areas for road side along with its control areas.

Table 1: Ambient air monitoring at three locations of Kathmandu during Sept. 2008–March 2009

S.N.	Category	Sampling locations					
		Singh Durbar		Koteswor		Satdobato	
		TSP	PM1	TSP	PM1	TSP	PM1
1	Road side	268	242	613	298	313	292
2	Control	88 ±18	25 ±7	95 ±12	49 ±22	146 ±43	90 ±34

*The values are in µg/m3. *The values are average of at least three estimations

The Table 2 clearly shows that the road side air quality of Singh Durbar, Koteswor, Satdobato was unhealthy, though among the control side, good air quality was found in singh Durbar area and other rest two were moderate.

Table 2: Ambient air quality at workplace environment of traffic policemen and shopkeepers (Exposed)

Location	Category	Air Quality Index (mg/m^3)	Air Quality Status
Singh Durbar	Road side	179	Unhealthy
	Control	58	Good
Koteswor	Road side	408	Very Unhealthy
	Control	63	Moderate
Satdobato	Road side	208	Unhealthy
	Control	97	Moderate

The Table 3 clearly shows that more exposed person reported to have more symptoms of respiratory illness. The respiratory symptoms shown as above table pain or tightness in chest, shortness of breath, Irritation in respiratory tract was considered. Among total participants most frequent response was for pain or tightness in breath and. The anthropometric parameters were found almost of same status.

Table 3: Physical parameters of subjects of the study areas and symptoms of respiratory diseases in the target groups (n=9045)

S. N.	Parameter	Result	
		Exposed	Control
1	Age (yr)	34 ± 10	33 ± 9
2	Height (cm)	162 ± 6	161 ± 16
3	Weight (Kg)	56.5 ± 4.5	59.5 ± 6
4	Symptoms		
	Pain or tightness in chest	48.9	8.9
	Shortness of breath	17.8	2.2
	Irritation in respiratory tact	13.3	4.4

The Table 4 presents information about Odds ratio (OR). The information on OR clearly states that those who were exposed to roadsides reported of having pain or tightness in chest 9.8 times of those who are not exposed. Those who were exposed have shortness of breath 9.5 times than non exposed. Similarly, exposed personnel reported to have irritation in respiratory tract 3.3 time than the non exposed persons.

Table 4: Comparison of risk of the respiratory symptoms among traffic policemen, shopkeeper (exposed) and control (non exposed) groups (n=90)

S. N.	Symptoms	Samples	Prevalence of symptoms		Odd ratio
			Yes	No	
1	Pain or tightness in chest	T. Police	22	23	9.8
		Control	4	41	
2	Shortness of breathe	T. Police	8	37	9.5
		Control	1	44	
3	Irritation in respiratory tract	T. Police	6	39	3.3
		Control	2	43	

DISCUSSION

High concentration of particulate concentration was reported by this study. The average concentration of particulates TSP and PM1 level found on the roadside mentioned three cities were more than a six hundred, nearly three hundred and less than three hundred were found for road side in Koteswor, Singh Durbar and Satdobato areas respectively. The concentration of particulate TSP and PM1 in the roadside of all

three studied cities were significantly higher than the control spots. Both TSP and PM1 concentration were higher in these areas during dry season.

Study recorded road-side TSP and PM1 level was higher than the air quality standard recommended by the United States Environmental Protection Agency .[6] It was therefore not surprising to find that the respiratory symptoms of traffic police men, shopkeepers were worse than control personnel as the TSP and PM1 level in control spots were within the recommended air quality standards. Sigh Durbar road side areas was found to have 3 times higher concentration of particulate matter than control area where as Koteshowr was found to have more than 6 times much than control parts, similarly at Satdobato particulate matter concentration was found more than 2 times. Healthy, unhealthy and moderate air quality standard was found for the study areas as per defined by ministry of environment and population.[7]

One person among two was seen as suffering from pain or tightness in breath. Less than one fifth were reported for shortness of breath and less than fifteen percent were reported to have irritations in respiratory tract. The higher cases of respiratory illness were higher among the case. The exposure to road dust and exhaust pollution might be the reason for respiratory symptoms among the traffic policemen and shopkeepers (exposed). In comparison of traffic policemen and shopkeepers the respiratory symptoms reported were less in the control group. Few respiratory symptoms that observed in the control group may be due to exposure during their travelling from and to office. In control group, less than one tenth suffered from pain or tightness in chest, less than five percent were suffered from irritation in respiratory tract where as nearly the negligible, only two percent were suffered from shortness of breath among the control group.

The calculated OR showed that there was of developing pain or tightness in chest among the case group was more than eight times than control group, whereas similar result was for developing shortness in breathe for same study group. Though, it was only found more than twice that the exposed person would develop the respiratory tract irritation. The evidence was supported by the study participants where more traffic and shopkeepers complained about respiratory illness than the study population who were less exposed to air pollution level. It was also interesting to note that from the secondary data analysis so performed, there was higher prevalence of ARI in all hospitals in the same years.[8] The evidence was supported by data from the hospital, it was doubtful that all the cases of ARI were reported by hospital staffs because of having poor system of record keeping and access to data for other person than hospital authority. The results showed similarity with study of urban and rural environments among the children either in OPD visits or admitted cases,[9] where the rural areas were being less polluted there was less number of respiratory diseases symptoms in rural area..

Having lots of strengths in the study, unfortunately in this study was unable to measure the level of

PM10 and PM2.5 due to lack of proper instrumentation and resources. It was so important to again explore the quality of air, since it was supposed to have increased pollution level now in comparison to successive year.

Besides, particulates the entry of various allergens along with dust particles possesses a great significance for majority of allergic disorders.[10] A large number of epidemiological studies have shown that long term exposure to the particulates were associated with adverse effect on health. The literature reported an increasing risk of allergy, respiratory disorders and lung function impairment associated with indoor air pollution, [11] and recommends that the adverse health effects of indoor pollution should be closely observed. In most of the studies, there was not found clear assessment of exposure, [12] so there should have clear assessment of exposure in order to have valid conclusions.

CONCLUSION

The study concluded that the air quality in Kathmandu is unhealthy for normal breathing and the populations who are working and inhaling such air are of greater risk of developing air borne diseases. Recommendation on using protective equipment such as mask, limiting duty hours for exposures on road side are done. The study also gives emphasis on epidemiological study with larger sample size, less bias, measuring PM10 and PM2.5 and also characterization of chemical composition of dust particle is also here by recommended.

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ORIGINAL ARTICLE

The proportion of Postnatal service Utilization and affecting factors in developing countries: A Systematic Review

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ABSTRACT

Background: Majority of neonatal and maternal mortalities occur in developing countries. Moreover, around half of both mortalities occur immediately after postnatal period. Postnatal care utilization is aimed to reduce both mortalities and promote their health status.

Methods: The articles published in PubMed, Google Scholar and HINARI between Jan 1, 2006 and Apr 31, 2014 were reviewed. Findings of cross-sectional studies and survey reports (in percentage) and factors affecting postnatal care utilization were included in the analysis. Weighted percentage with 95% CI was calculated to summarize the proportion. The odds ratio of minimum and maximum value was used to summarize associated factors. P-value <0.01 was taken as the significant value for associated factors.

Findings: Of 45 accessed and reviewed full-text articles, 9 included in the review. The studies were conducted in seven countries and total postnatal mothers in all samples were 49385. The weighted percentage of postnatal service utilization was 36.0 (95% CI, 22.5-49.5). Mother's and husband's higher education level; higher wealth quintile of the family; occupation; mother's age at last delivery; number of ANC visit; and number of pregnancy were found associated with postnatal care utilization.

Conclusion: The data that only around one in every three mothers utilizing post-natal care shows that scaling-up and improving the service is imperative. The education, including literacy programs for both mother and husband; scaling-up of the 4th ANC visit; creating earning opportunities for mothers and focusing the mothers of 20-30 years age group would be some intervening areas, however, further evaluation and reviews from Interventional designs are suggested before reaching the firm conclusion.

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INTRODUCTION

The highest risk of death for both newborns and mothers occurs around the time of childbirth and the immediate postnatal period. More than two-thirds of newborn deaths occur by the end of the first week after birth, with up to one-half of all deaths occurring in the first 24 hours of birth. Similarly, approximately two-thirds of all maternal deaths occur in the postnatal period.[1] More than three-fifth (62%) of maternal deaths occur soon after birth with postpartum hemorrhage. Earlier studies at different countries have shown that some 50% of maternal deaths and 40% of neonatal deaths occur within 24 hours after birth (immediate postnatal period).[2] Complications following childbirth, such as chronic pain, impaired mobility, damage to the reproductive system, genital prolapsed and infertility are also more common in developing countries.[3] Postnatal care is one of the most important maternal health care services for not only prevention of impairment and disabilities but also reduction of maternal mortality. The postpartum period starts about an hour after the delivery of the placenta and includes the following six weeks.[4] It is widely accepted that the use of maternal health services helps in reducing maternal morbidity and mortality. However, the utilization of maternal health services is a complex phenomenon influenced by many factors. Various studies conducted worldwide and in India have recognized socio-economic factors and service delivery environment as important determinants for the use of maternal health services. A study on influence of community-level characteristics on the use of maternal and reproductive health services conducted in Uttar Pradesh state of India reported strong community-level influences on service use.[5] Several factors such the availability, accessibility, socioeconomic status of the users, and women's autonomy in household decision-making and quality of services as well as the characteristics of the users and communities in which the users live is directly associated with utilization of PNC in developing countries.[6] Studies from rural Bangladesh found that some of these factors were positively associated with the utilization of health services.[7] The aim of this study is to characterize and to find out the proportion of post-natal care utilization in developing countries.

METHODS

Search strategy and selection criteria

The articles published in PubMed, Google Scholar and HINARI between Jan 1, 2006 and Apr 31, 2014 were reviewed. The articles were searched, retrieved and managed by using EndNote (version X3) software. The key words entered were 'utilization'; 'postnatal services'; 'developed or high-income country'; 'utilization'; 'Nepal'; 'maternal'; 'developing' or 'low and middle income countries'; 'factor'; 'south east Asia region'; Bangladesh'. Other data sources included national demographic and family health surveys.

Screening and data extraction

Only published articles in English language based on

cross-sectional studies, carried out among Married Women of Reproductive Age (MWRA) in developing countries were reviewed. Besides this, the surveys carried out among women examining any aspect of the utilization of PNC in developing countries. The data extraction was done manually and filled in the figure.

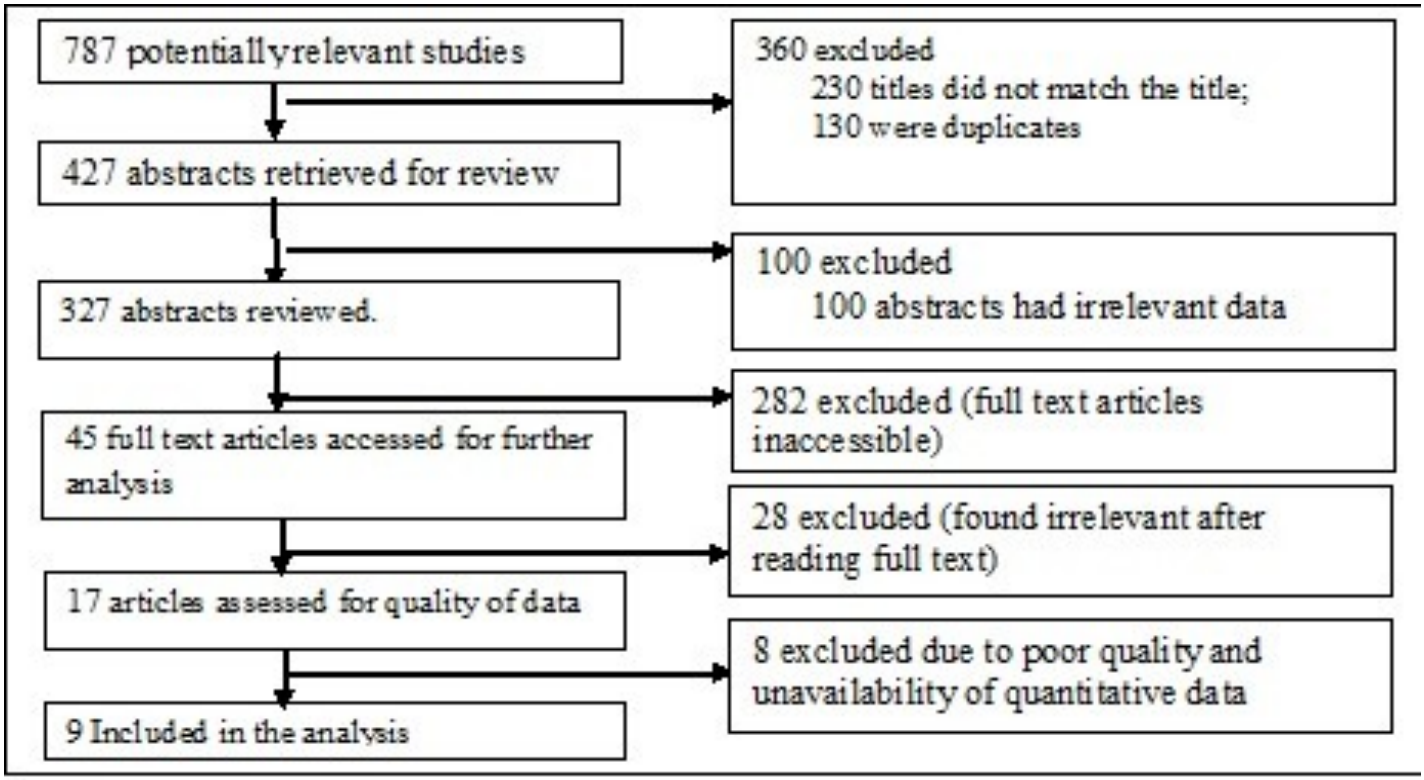

Fig. 1: Flowchart of articles selected for the review process

Statistical analysis

The weighted percentage was calculated from the percentages of different 9 original studies conducted in seven developing countries. One study [7] conducted in three countries, i.e. Nepal, Malawi and Bangladesh had three samples from the respective countries and dealt as three studies; rendering 11 sample studies. The 95% CI was done after calculating the standard error of percentages of included studies. Both weighted and 95% CI of percentages were calculated in MS-Excel 2007.

RESULTS

The studies conducted in Nepal, Palestine, India, Nigeria, Bangladesh, Malawi and Ethiopia were finally included in the review process. Weighted percentage of at least one post-natal care utilization within 42 days of delivery was 36.0 (95% CI, 22.5-49.5); ranging from 11% in Bangladesh to 50% in Nepal (table 1). The per-

centage ratio between the richest (77.1%) and the poorest (22.7%) revealed 3.4. Similarly, the review showed that the care utilization was relatively higher in private (96.0%) than in public (72.4%) institutions.

Table 1: Percentage of postnatal care utilization and total weighted percentage

SN	Article	Country	Study year	Study population	Sample size	Study design	Utilization Rate
1.	Dhakal 2007	Nepal	2006	MWRA	150	Cross-Sectional	34% in 1st and 19% in 2nd (received within 48 hours of giving birth)
2.	Dhaher 2008.	Palestine	2006	MWRA	264	Cross-Sectional	36.6% received PNC
3.	Jat 2011	India	2007	MWRA	15,782	Cross-Sectional	37.4% women received post-natal care within two weeks
4.	Rai 2012	Nigeria	2008	Married adolescent (aged15–19 years) women	2,434	Demographic and Health Survey	32% received postnatal care within 42days of delivery
5.	Singh 2012	India	2005-2006	Married adolescent mothers in rural areas. (aged15 –19 years)	23,955	National Family Health Survey (NFHS)	35%
6.	Sitrin 2013	Bangladesh, Malawi & Nepal		MWRA	398 900 615	Cross-Sectional	Home visits within three days after birth was 57% in Bangladesh; 11% in Malawi; and 50% in Nepal
7.	Paudel 2013	Nepal	2012	MWRA	223	Community Based Cross Sectional Study	25.1% attended any PNC; 13.5% attended early PNC (within 24 hours of delivery) and 19.3% sought PNC service from health workers
8.	Workineh 2014	Ethiopia	2013	MWRA	594	Cross-sectional	20.2%
9.	Khanal 2014	Nepal	2011	MWRA	4079	Cross-sectional	43.2% (95%CI; 39.9 – 46.5%)
Total sample size and weighted percentage					49,385		36.0% (95%CI, 22.5%-49.5%)

Maternal secondary level or above schooling compared with illiterate (OR range, 0.19-6.49) ; housewife being the occupation compared with farmer (OR range; 0.33-7.25); husband's secondary or above level schooling compared with illiterates (OR range; 1.01-6.33); age of 20-30 years at last delivery compared with ≥35 years (OR range; 1.66-1.90); richest wealth quintile compared with poorest (OR range; 0.98-2.74); second or higher pregnancies and higher ANC visits were found to be higher odds of postnatal care utilization (table 2).

Table 2: Significantly associated (p<0.01) variables and odds ratio

SN	Variables	Reference category	Odds ratio (min-max)	No. of studies	Study references (table 1)
1.	Mother's educational level	Illiterate	0.19-6.49	All (9)	1-9
2.	Occupation	Farmer/ Agriculture worker	0.33-7.25	5	1-3, 8,9
3.	Husband's education	Illiterate	1.01-6.33	5	1-5
4.	Age at last delivered	≥35 years	1.66-1.90	6	1-4,6,9
5.	Wealth quintile	Poorest	0.98-2.74	2	3,5
6.	No. of pregnancy	One	0.72-3.68	1	7
7.	No. of ANC visit	Zero	3.32-3.71	1	7

Maternal education; husband's education; and occupation are the strongest factors having an odds ratio above five revealed as strong factors; whereas the number of pregnancy and number of ANC visits having above three odds ratio show up as moderate factors; and richest wealth quintile and age at last delivery having an odds ratio less than three revealed as weak factors. These factors along with their effect-sizes could be helpful in bringing out higher utilization rate in developing countries and thereby increasing maternal and neonatal health status (table 2).

DISUCSSION

The review has evaluated a limited number of studies published in English during 2006-2013 AD. Nine studies have mentioned the percentage of PNC utilization and effect size (OR) of different factors. The important role of maternal education that play for utilization of PNC followed by husband's education, woman's occupation, and socioeconomic status have been found. Out of 9 reviewed articles, the weighted PNC utilization proportion was calculated 36.0 (95% CI, 22.5-49.5) and ranged from 11% in Bangladesh to 50% in Nepal. It indicates below average utilization rate of PNC in developing countries.

Contributors

CA developed the guideline of review. RKY, PT, RO, DG and AG retrieved the articles; extracted the data. CA calculated the summary proportion. RKY, PT, RO, DG and AG prepared the draft manuscript. CA edited the draft and prepared the pre-final manuscript. BR edited the final manuscript.

Conflicts of interests

We declare that we have no conflicts of interests.

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*Note: Article, of which data has been included in the systematic review

ORIGINAL ARTICLE

A Home delivery Care Practices and associated factors in a Jhangad Community of Eastern Nepal

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ABSTRACT

Background: Pregnancy, childbirth and their consequences are still the leading causes of death, disease and disability among women of reproductive age in developing countries more than any other single health problem. Over 72 % of deliveries in Nepal are at home.The aims of good delivery care are: through asepsis, delivery with minimum injury to the infant and mother, readiness to deal with complications, mal-presentations and care of baby and mother at delivery.

The objective of this study was to explore home delivery care practices and associated factors among recently delivered mothers in the Jhangad community of Eastern Nepal.

Methods: The study was of descriptive, cross sectional type. The Lot Quality Assurance Sampling (LQAS) technique was applied. Total 162 recently delivered mothers residing in Morang and Sunsari districts of Eastern Nepal were considered as study participants. Data was collected using an interview technique with semistructured questionnaires and analyzed using SPSS applying descriptive and inferential statistics.

Results: Of the respondents, 69.1% were illiterate, 82% were wage laborers and 53% were living in a joint family. The majority (98.2%) of the deliveries was conducted inside the sleeping room. Only 11.7 percent of deliveries were carried out on plastic, 59.9 percent on old mat and 28.4 percent on the ground. About 48.1 percent of the deliveries were assisted by Mother-in-laws/Friends/Neighbors followed by a traditional birth attendant (27.2%) and trained traditional birth attendants (17.3%). Only 3.1% deliveries were conducted by Maternal and Child Health Worker (MCHW), 1.9% by Auxiliary Nurse and Midwife (ANM), 0.6% by Staff Nurse (SN) and 0.6% by Health Assistant (H.A.)/Sr.AHW. Only 22.8% of respondents used a Clean Health Delivery Kit (CHDK) in their last delivery and only 11.7 % of mothers conducted delivery in a clean place.

Conclusion: Very few deliveries were conducted by skilled birth attendants and the majority did not use CHDK. Different socio-demographic factors like economic status of the family and occupations of mothers were found to be statistically significant with clean place of delivery ($P < 0.05$). Practices concerning home delivery care were based on deep-seated traditional beliefs and ignorance.

Key words: delivery care, home delivery, associated factors, Eastern Nepal

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Introduction

Government of Nepal has given priority to safe-motherhood program for reducing maternal and neonatal morbidity and mortality. The current statistics of the 4000 women and 30,000 newborns are dying every year in Nepal. This will be significantly reduced by striving to achieve the Millenium Development Goal (MDG) of 60% of deliveries attended by a skilled birth attendant (SBA) by 2015. The common five causes of maternal deaths, most of which are preventable with the provision of adequate Antenatal Care (ANC), safe delivery practices and timely referal and well organized and accessible family planning (FP) services[1,2,3].

By tradition, home is the most common place for delivery in Nepal. The challenge is not to change the culture of home delivery, but to make it clean, safe and within the limits of referral management to avoid the death or serious illness of the mother and newborn[4].The neonatal mortality care guideline recognizes that the home will remain the preferred place for the foreseeable future; it recommends that women with health problems during pregnancy should deliver in a health facility (HF) [6,8].

Nepal government has formulated the " National Essential Maternal and Neonatal Health (MNH) Care Package" in 2006, which consists of basic sets of health care interventions that should be available at different levels of the health care delivery system, to all women and their newborns to prevent and manage common obstetric and neonatal complications. The MNH package defines all those activities which should perform at family level to District Hospital health care delivery system for ensuring that every pregnancy result in the best possible outcome for mother and newborn. [5,8]

The presence of the SBA at delivery is associated with lower maternal and newborn deaths [7,8]. Its maximal influence is in the reduction of deaths during the first 24 hours after birth, which represents about 40 percent of all neonatal deaths. Appropriate care of the normal newborn is neither widely understood nor practiced in the community or health system. Traditional attitudes and practices dominate newborn care and are often hazardous. In Nepal home delivery is 81 percent of all births and about 50 % deliver with the assistance of a non skilled personnel's like friends or relatives [10,11].

There is limited use of safe motherhood and neonatal health care services by disadvantaged ethnic groups because of limited knowledge on maternal and neonatal health issues and lack of prior preparation to access those services [12].

Materials and Methods

This was a community based descriptive, cross sectional study conducted among mothers who delivered within 28 days in Morang and Sunsari districts of Eastern Nepal. The study was conducted from July 2013 to December 2013. All the mothers in the Jhangad community who had delivered at home before the 28 days were considered as the study population. In the first stage, geographical areas with the Jhangad population were divided into eight sub-

geographical areas and 20 samples were collected randomly from each sub-geographical area using the LQAS technique. LQAS is used to quantify results for an entire catchment area (e.g., district or province or nation) suitable for reporting purposes and most frequently used size =<20 per sub geographical or supervision area.

A total of 162 samples was collected using pre-tested semi-structured questionnaire. Verbal consent was taken from the mother before starting the study. Those mothers who were not permanent residences for less than one year, who had delivered at home before 28 days and those who were in the Village Development Committee (VDC) during whole data collection period were included. The data was entered and analyzed in the Statistical Package for Social Sciences (SPSS- Version 16). Descriptive analysis, such as percentage, mean and standard deviation (SD) was used to describe the composition and Chi- Square test was applied to determine the relationship of the study variables. P-values <0.05 was set to consider the level of significance. Qualitative data were analyzed by content analysis. The results were analyzed with both descriptive and inferential statistics.

RESULTS

A total of 162 mothers responded and the response rate was 100 percent. The mean age of mothers who delivered within 28 days was 25.02 years with a standard deviation of ±4.01. Of the respondents, 69.1% were illiterate, 82 % were wage laborer, 53% were living with a joint family, 79.6% did not have sufficient income to maintain daily expenses and about 58% of the newborns were male (Table 1).

Table 1: Socio-demographic characteristics of respondents (n=162)

Socio-demographic characteristics	Frequency	Percentage (%)
Age group		
15-19	9	5.6
20-24	62	38.3
25-29	72	44.4
30-34	12	7.4
35-39	7	4.3
Mean age ±SD= (25.02± 4.01) years		
Educational status		
Illiterate	112	69.1
Literate	8	4.9
Primary	28	17.3
Secondary	14	8.7
Occupation of the mother		
Wage labor	134	82.7
Agriculture	26	16
Service	2	1.3
Type of family		
Nuclear	76	46.9
Joint	86	53.1
Economic Status		
Lower	129	79.6
Middle	30	18.5
Higher	3	1.9
Sex of the child		
Male	94	58.0
Female	68	42.0
Parity	Mean=2.48	SD=±1.26

Table 2: Practices of home delivery among the study population

Characteristics of home delivery	Frequency (n= 162)	Percentage (%)
Place of home delivery		
Inside sleeping room	159	98.2
Field	2	1.2
Other	1	0.6
Surface of child birth		
On plastic	19	11.7
On mat	97	59.9
On ground	46	28.4
Attendant of home delivery		
Mother-in laws/	78	48.1
Neighbors	44	27.2
TBAs	28	17.3
Trained TBAs	5	3.1
MCHW	3	1.9
ANM	1	0.6
Nurse	1	0.6
HA/Sr. AHW	2	1.2
Quake		
Hand washing by birth attendant		
Yes	137	84.5
No	10	6.2
Do not know	15	9.3
Substances used for hand washing (n=137)		
Soap and water	116	84.7
Water only	21	15.3
Use of clean home delivery kit (n=162)		
Yes	123	76
No	37	22.8
Don't Know	2	1.2
Clean place of delivery (n=162)		
Yes	19	11.7
No	143	88.3

To find out the clean practices during home delivery, respondents were asked about the place of birth, attendant during delivery, hand washing by birth attendant and the use of clean home delivery kit during their recent delivery *(Table 2)*.

Place of home delivery

The majority of the deliveries (98.2%) was conducted inside the sleeping room whereas the other (1.2%) took place in a field and only 0.6% in another place (i.e. in the way to house).

Surface of home delivery

Only 11.7 percent of deliveries were done on plastic, 59.9 percent on old mat and 28.4 percent on the ground.

Birth attendant at home delivery

About 48.1 percent of the deliveries were assisted by Mother-in-laws/Friends/Neighbors, it is followed by a traditional birth attendant (27.2%) and trained traditional birth attendants (17.3%). Only 3.1percent deliveries were conducted by MCHW, 1.9 percent by ANM, 0.6 percent by SN and 0.6 percent by H. A./Sr.AHW.

Hand washing by birth attendant

Of 162 respondents, 84.6 percent birth attendants got to wash their hands before assisting the delivery, 6.2 percent did not wash and remain 9.3 percent respondent couldn't recall it. Out of them, about 84.7 percent attendant used soap and water and 15.3 percent used only water for hand washing.

Use of clean home delivery kit (CHDK)

Only 22.8 percent of respondents had used CHDK in their last delivery and 1.2% can't recall it.

Clean place of delivery

Clean place of delivery was considered as conduction of delivery in sleeping room on the plastic. Out of 162 respondents, only 11.7 percent had conducted delivery in a clean place while remaining in unclean places (mat and on the ground).

Table 3 : Association of clean place of delivery and different socio-demographic factors

Variable	Clean place of delivery		Statistical test value
	No	Yes	
Age (Yrs)			
<20	0	22	P=0.37
20-40	19	121	c2 = 2.58 at df=1
Educational status			
Illiterate	99	13	P=0.53
Literate	7	1	c2 = 5.036 at df=3
Primary	26	2	
Secondary	11	3	
Parity			
2 or < 2	5	33	P=0.55
3-5	10	66	c2 = 4.6 at df=2
6-8	4	44	
Family type			
Nuclear	67	9	P=0.46
Joint	76	10	c2 = 1.53 at df=1
Economic status			
Lower	118	11	0.04 (c2 2 = 10.03)
Middle	22	8	
Higher	3	0	
Occupation			
Agriculture	19	7	0.02 (c2 2 = 11.307)
Service	1	1	
Labor	123	11	
Sex of newborn			
Male	81	13	0.22 (c2 1 = 3.002)
Female	62	6	

Clean place of delivery and association with socio-demographic factors

The association in a clean place of delivery with socio-demographic factors showed that the economic status of the family and occupation of the mother were statistically significant with clean-place of delivery (P-value <0.05). There was no statistical significance between clean place of delivery with age of mother, education status of mother, parity, family type and sex of neonates *(Table 3)*.

DISCUSSION

The objective of the study was to identify home delivery care practices and examined the association with sociodemographic variables among recently delivered mothers in the Jhangad community of Sunsari and Morang districts. This study describes home delivery care practices and examined their association with socio-demographic factors. Home delivery care practices in this setting had not been described previously.

Labor was the main occupation of the respondents, which is consistent with the fact that most Janjati people in Nepal are engaged in labor for a livelihood. The result indicates that the people from Janjatis group are mostly involved in labor and agriculture, whereas their involvement in service and business is very nominal. This is true because the people from Jhangad (Janjatis) group are less educated. WHO has recommended four strategic interventions or "four pillars" for safe motherhood. These include family planning, antenatal care, clean/safe delivery and emergency obstetric care[12].The study found that most of the deliveries, 98.1%, took place either in a sleeping room or some place inside the house, which was similar to the earlier studies done by T Sreeramareddy et al. in urban areas, (92.5%), and by Osrin D et al. in rural areas of Nepal (90%).[13,14,19]. An earlier study done by Thapa N. et al. highlighted that cattle-shed deliveries were contributing to higher rates of infant mortality in the remote rural areas of Nepal[17]. In the present study, most of the deliveries, 48.1%, were attended by a neighbor or mother-in-law followed by Traditional Birth Attendants (TBAs), 27.2%, which is not matched with the data reported by Nepal Demographic and Health Survey 2006**,** >50%. The study conducted by Osrin D. et al of the rural areas of Nepal has revealed that the mother-in-laws are the primary attendants during the delivery and care of the newborn [19]. This study also shows consistency with the present study and is not similar to an earlier study of urban areas of Nepal (5%) done by Sreeramreddy CT et al [14]. Such a difference may be due to demographic structure of the rural Jhangad population.

The studies in urban slum of Delhi conducted by Rahi M et al (91.3%) revealed the mother-in-laws or untrained attendants, mostly conduct the deliveries which is consistent to the present study (75.5%) [15]. Maternal and child health workers who are identified as key birth attendants by the policy makers conducted only 3.1 percent of deliveries in this study. This study highlights that attendance of health worker

at home deliveries is low in semi-urban areas also. The present study shows that only 6.3% of the mother had delivered by health workers. More or less similar has been reported in Nepal by NDHS 2006 (7%) [11].

Infection accounts up to 36% of neonatal deaths. Therefore, WHO emphasizes "five cleans" during the delivery. The "five cleans" are: a clean delivery surface, clean hands of the birth attendant, a clean blade, a clean tie and a clean cord stump with nothing applied to it. There were 84.6% of the birth attendants who had washed their hands before delivery, which is better than the studies from Bangladesh conducted by Barnett et al (67%) and from rural Nepal conducted by Osrin et al. which reported that 55% of the attendants washed their hands [19,20]. The Clean Home Delivery Kit (CHDK) was used in 22.8% of the deliveries, which was higher than reported by NDHS 2006, 9%, and the study from West Bengal, 15%, and less than the earlier study done in urban Nepal by Sreeramreddy et al, 34.5%. [14,16].

CONCLUSION

Very few (22.8%) of mothers used the clean home delivery kit during delivery. Most of the deliveries were conducted without support of skilled birth attendants. Practices concerning home delivery care are based on deep-seated traditional beliefs and ignorance. Maternal mortality can be significantly reduced through improved delivery care practices and use of community-based health services. Several efforts have been made to reduce maternal mortality. Nepal government has formulated the " National Essential Maternal and Neonatal Health Care Package" in 2006, which consists of basic sets of health care interventions that should be available at different levels of the health care delivery system, to all women and their newborns to prevent and manage common obstetric and neonatal complications.

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ORIGINAL ARTICLE

A Descriptive Study on Indoor Air Pollution in Talku Area of Pharping VDC in Kathmandu Valley

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ABSTRACT

Introduction: Most of the households in developing countries rely on coal and biomass in the form of wood, dung and crop residues for domestic energy. About half of the world's population is estimated to use solid bio-fuels. Indoor air pollution in developing world from biomass smoke is considered to be a significant source of public health hazard, particularly to the poor and vulnerable women and children.

Method: The study was carried out in one of the Village Development Committees (VDCs) of Pharping area in Kathmandu district: Telku VDC. Oral informed consent was taken from each household representative before interviewing. The descriptive cross sectional study design was used for the research.

Result: The study shows that majority of people are dependent on biofuel like wood and most of them do not have separate kitchen with sufficient ventilation in it. Majority of the respondent has got higher exposure in the kitchen that could have led to be more vulnerable to diseases as well as suffer from respiratory illness.

Conclusion: The study reflects unsatisfactory condition of locally built houses in terms of indoor air pollution. The people of the study area spent longer hours inside the poorly ventilated house and near the traditional stove with high smoke exposure, which can be considered as one of the risk factor for exposure to diseases. Due to the remoteness and lack of fuel alternatives, majority of the population of the study area depend upon the fuel wood. Therefore, promotion of environmental friendly fuel and awareness on health effects of indoor air pollution can make better living of people in the community.

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INTRODUCTION

Indoor air pollution is defined as pollution exposure at home and work. Pollutants causing indoor air pollution includes Carbon monoxide (CO), Nitrogen oxides (NOx), Tobacco smoke, Asbestos, Formaldehyde, Suspended particulate matter (SPM), Ozone, Carbon dioxide and Viable particulate matter. Sources of Indoor air pollution found commonly are Combustion, smoking, building materials, office and domestic electrostatic machine and other sources etc. Indoor air pollution in developing world from biomass smoke is considered to be a significant source of public health hazard, particularly to the poor and vulnerable group like women and children who spend most of the time in kitchen.[1]

It has been estimated that approximately half the world's population, and up to 90% of rural households in developing countries, still rely on biomass fuels.[2] In developed countries, modernization has without exception been accompanied by a shift from biofuel to petroleum products (kerosene, LPG) and electricity. In developing countries, even where cleaner more sophisticated fuels are available, households often continue to use biomass.[3]

More than three billion people worldwide continue to depend on solid fuels, including biomass fuels (wood, dung, agricultural residues) and coal, for their energy needs. Many people spend large portion of time indoors - as much as 80-90% of their lives. Poverty condemns around half of the world's population to use solid fuels for cooking and heating their homes. According to The world health report 2002 indoor air pollution is responsible for 2.7% of the global burden of disease. Indoor smoke leads to the deaths of over 1.5 million men, women and children each year. In developed countries, smoking is responsible for over 80% of cases of chronic bronchitis and for most cases of emphysema and chronic obstructive pulmonary disease.[4]

Though the world has moved into the cleaner technologies, with the increase in the awareness level about the effects of pollutants on human health, the residents of rural areas of developing countries are still facing the pollutants coming out of their kitchen. Indoor air pollution is the serious risk for the respiratory ill health. This study will provide a database on what is the situation of the health condition of the local people and how it is related to the indoor air pollution and kitchen characteristics.

METHODS

The Descriptive cross-sectional study design was used in this research. The study was conducted in Talku dudechaur VDC, Pharping of Kathmandu district in Central Development region of Nepal. Sample size for household was taken to be 64, which was estimated by using statistical formula at 95% confidential level. In all the households, physical examination of household parameters were carried out, which included: location of kitchen, partition and dimension, types of stoves present, number of ventilation present etc. Respondent sample size was also taken to be 64

(one from each household). The formula for the determination of sample size was as follows:

$n = NZ^2P(1-P)/ Nd^2 + Z^2P(1-P)$

where, n = sample size

N = total number of household

Z = confidence level (at 95% level Z = 1.96)

P = estimated population proportion (0.05, this maximize the sample size)

d = error limit of 5% (0.05)

Simple random sampling technique was used to study the sample population. Data were processed in MS Word and MS Excel and analysed in pie charts and bar diagrams.

RESULTS

The study was carried out using 64 samples out of which 70% were female and 30% were male participants (Figure 1).

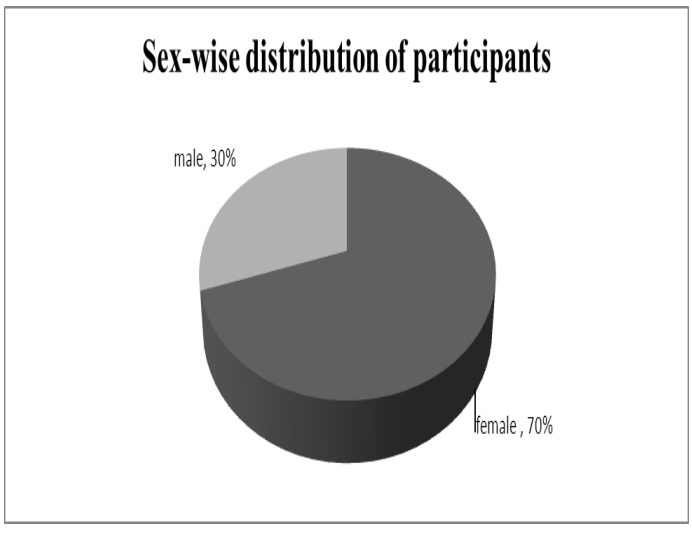

Figure 1: Sex-wise distribution of participants

Out of total participants, 58% of them were female only who were involved in cooking, while there were not any "male only" who were involved in cooking. However, 42% participants of both male and female were involved in cooking.(Figure 2).

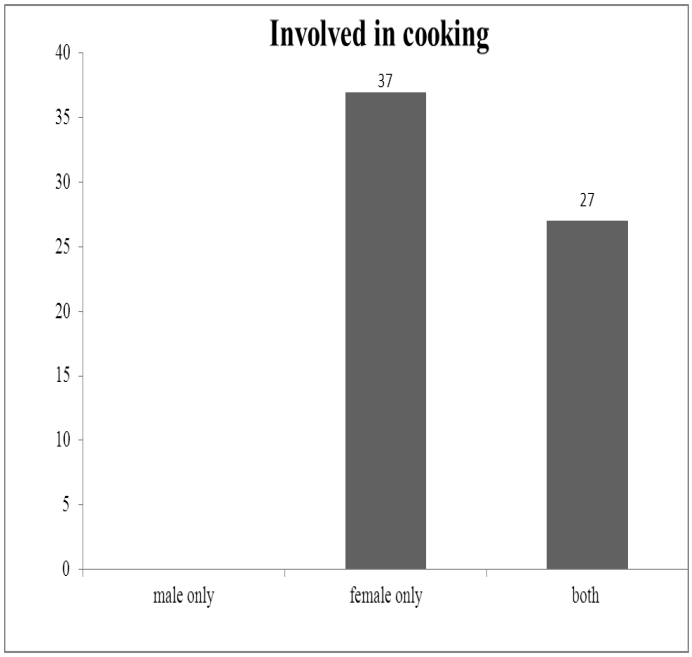

Figure 2: Participants involved in cooking

Similarly, 81% were smokers and 19% were non-smokers (Figure 3)

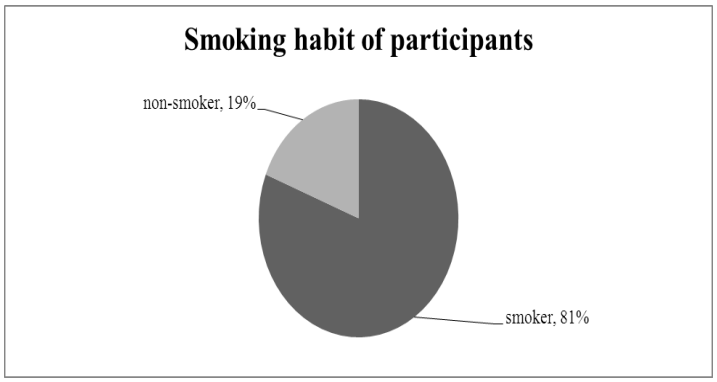

Figure 3: Smoking habit of participants

The result shows that 53% of the participants have separate kitchen in their home, while 47% of them have no separate kitchen(Figure 4).

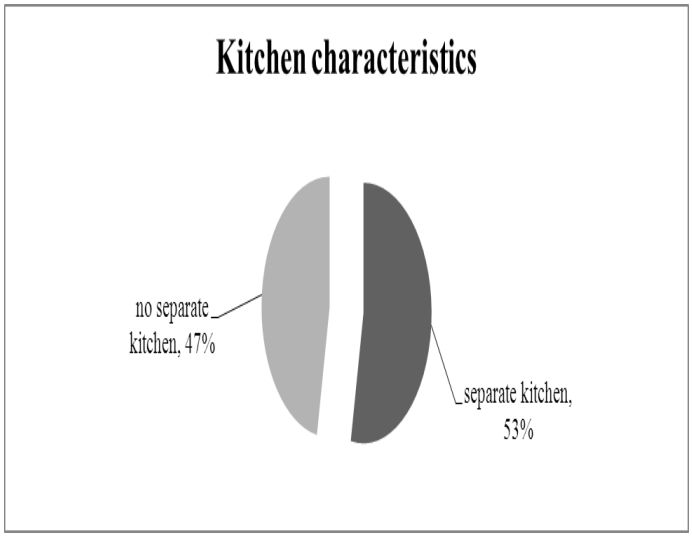

Figure 4: Household kitchen characteristics

Wood as a source of fuel is used by 44 (69%) of the participants, gas by 12 (20%) and dung cakes and kerosene by 5 (8%) and 3 (3%) participants respectively (Figure 5).

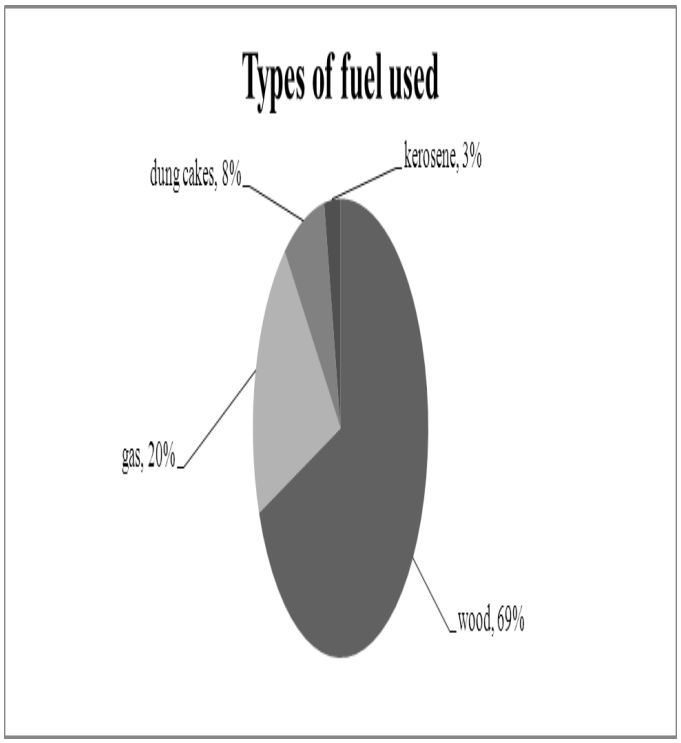

Figure 5: Types of fuel used during cooking

Likewise, 38 (60%) participants have one window in their kitchen 4 (6%) participants have two windows in their kitchen, while 22 (34%) of the participants don't even have single window in their kitchen (Figure 6).

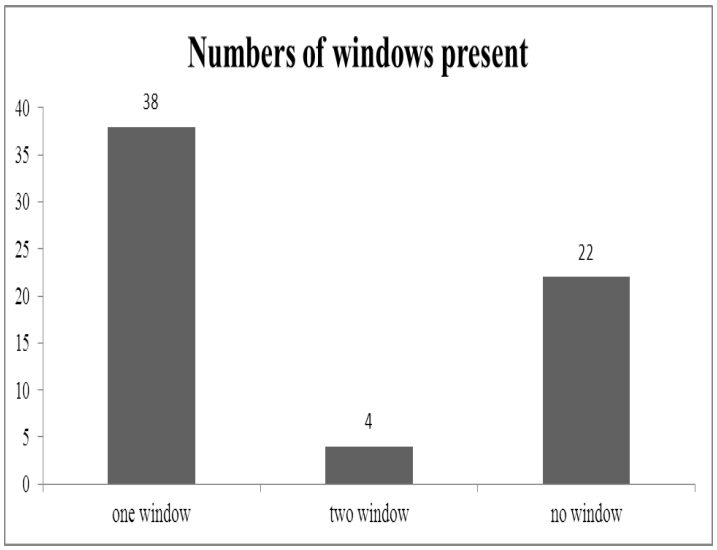

Figure 6:Number of windows present in the kitchen

Similarly, 80% households were observed to have high soot/tar deposition in ceiling, 14% with moderate deposition, while 6% were observed to have low soot/tar deposition in the kitchen(Figure 7)

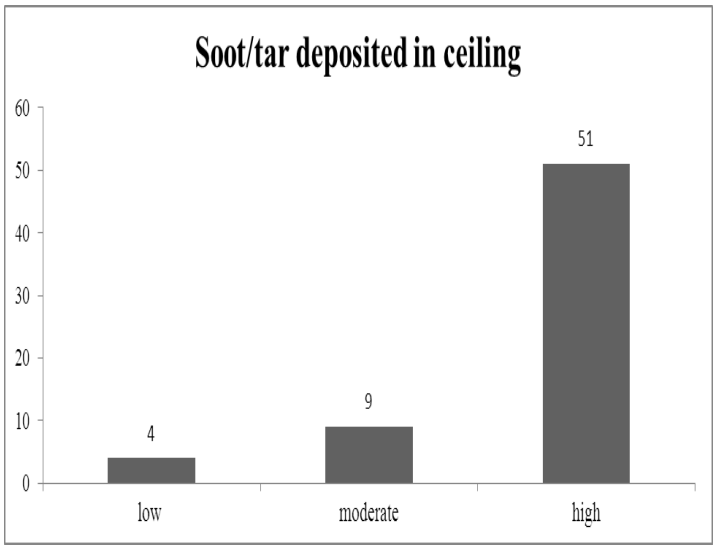

Figure 7: Soot/tar deposited in ceiling kitchen-

While analysing out the duration of exposure to the

smoke, it was found that 7% participants reported 1-2 hour of exposure duration, 41% reported of 3-4 hour exposure duration, while 52% participants reported of 5-6 hour exposure duration to smoke in the kitchen. Almost all the households had the problem of load shedding (Power cut) in the area.

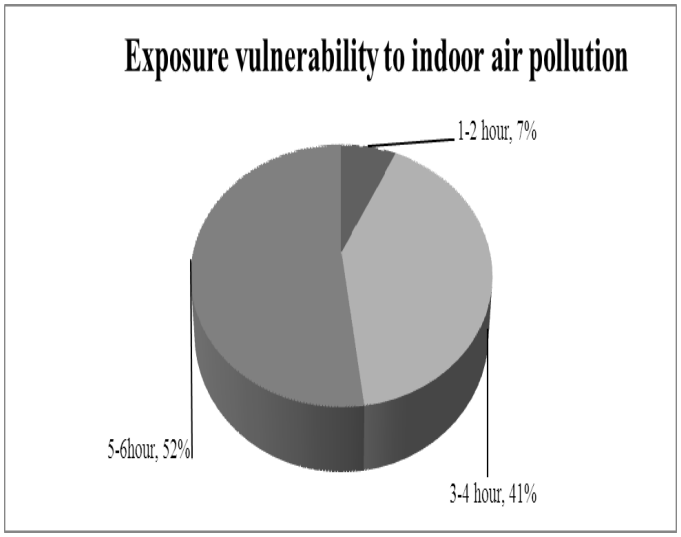

Figure 8: Exposure Vulnerability (in hour) to indoor air pollution

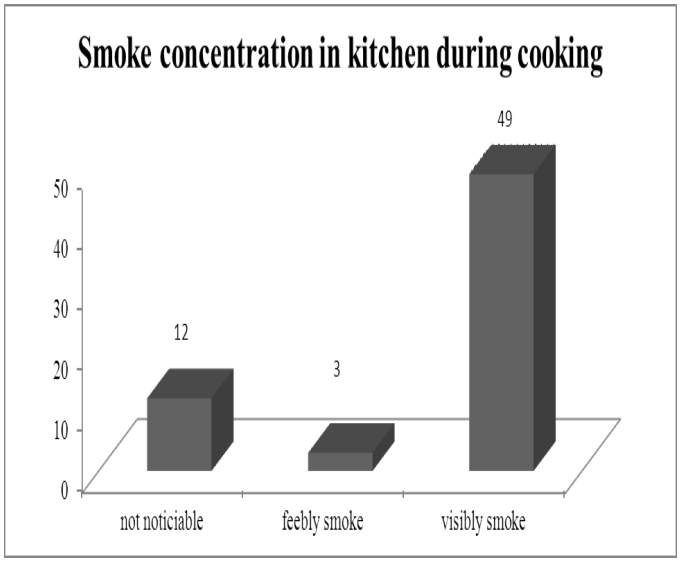

Figure 9: Smoke concentration in kitchen during cooking

Amount of smoke in kitchen during cooking were observed and/or asked with the subjects.Among the respondents, 19% participants reported that there is no noticeable smoke in their kitchen, 5% reported having feebly smoke, while 77% reported of visibly smoke present in their kitchen while cooking(Figure 9).

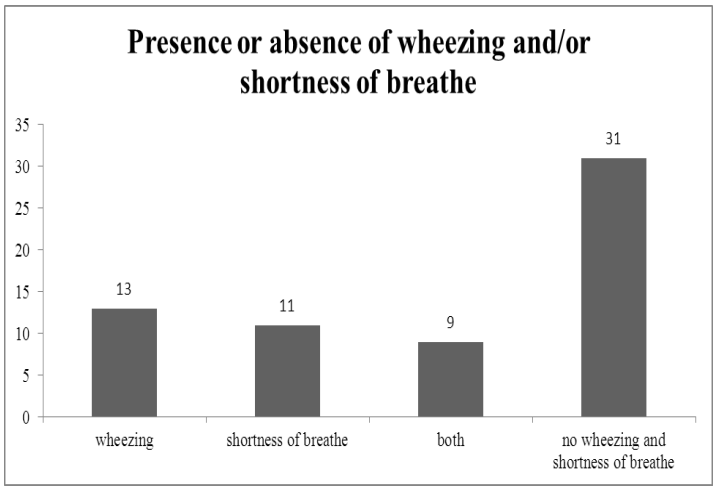

Figure 10:Presence or absence of wheezing or shortness of breathe

All the participants were asked if they are suffering from wheezing and/or shortness of breath since last 2 months; 20% participants reported of wheezing, 17% reported of shortness of breath, 14% reported of both wheezing and shortness of breath while 49% reported of neither wheezing nor shortness of breath (Figure 10).

Participants were also asked if they were suffering from any kind of indoor air pollution related diseases like bronchitis, TB. The result shows that 30% participants reported history of past illness while 70% reported no history of past illness.

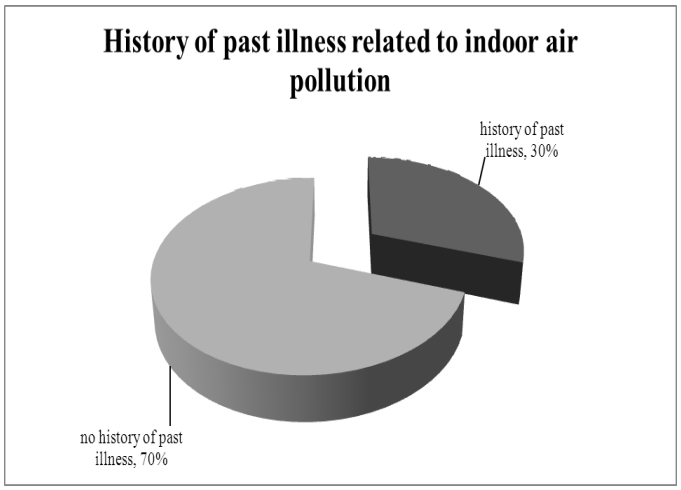

Figure 11: History of past illness related to indoor air pollution

DISCUSSION

During the survey in Telku VDC, it was found that the use of biomass fuels has deteriorated the indoor air quality of houses. It was found that almost half of the households don't have separate kitchen. The reason for no separate kitchen was due to poverty, lack of awareness on benefits of separate kitchen. Majority of people are women who are affected by the indoor air pollution because they are found in kitchen most of the times. According to NDHS survey 2011[5], majority of people in Nepal (75%) are still dependent on solid bio-fuel. In this study, larger number of population use wood as a major source of fuel. It is because wood is most easily available from nearby forest and also people couldn't afford for gas stove and other improved cooking stoves due to their low income or no earning at all. The greater percentage of the visibly smoke concentration in house was because of the greater percentage of the biomass used as fuel and also because of the fact that almost one-third of the households have no window/ventilation in their kitchen. Reasons attributed to the majority of the participants to have been exposed for longer hours (5-6 hours) was that the single person or two were regularly involved in cooking from morning to evening (2-3 times). The power cut is also a major factor to drive people to use fossil fuel as many of them said, *"What is the reason to buy rice-cooker if there is no power..."*. The reasons for shorter hours exposed to indoor air pollution were that some members of the family had to go for outdoor activities including economic and educational activities. In a study[6], prevalence of chronic bronchitis in females were highly prevalence (i.e. 12.57%) among non-smoker, which shows strong association of indoor air pollution and respiratory disease. In another study[7], significantly more respiratory disorder was seen high among people using biomass fuels than those who use cleaner fuels (kerosene, LPG and biogas). Similarly, in this study, more than half of the respondent from the study area suffered from respiratory illness. This result could have further favoured by the smoking habit of the respondents, as we found in our study that 81% were smoker.

CONCLUSION

Indoor air pollution in Nepal from biomass smoke is considered to be a significant source of public health hazard and Pharping VDC is no exception to this. The sources of indoor air pollution are use of solid fossil fuels. Almost half of the household do not have

separate kitchen. Many Nepalese still use traditional cooking stoves that produce lots of smoke causing a high degree of indoor air pollution. Wood is most easily available from nearby forest and also people couldn't afford for gas stove and other improved cooking stoves due to low income so wood as fuel is used in most households. Visibly smoke concentration was seen in most household and it was accompanied by inadequate windows and ventilation in house and this result in more soot/tar deposited in the wall and ceiling and also the respiratory illness. Majority of the respondent spend longer hours in the kitchen. More than half of the respondent of the study area suffer from respiratory illness. It is obvious that many respiratory infections are caused by poor air quality. In Nepal, every year children under 5 years of age die due to ARI and women are being more vulnerable to such diseases as they are involved in cooking activities.

The problem of indoor air pollution can be solved by the use of available alternative technology. Following recommendations can be considered to improve the indoor air quality and life style of people in the community.

Household air quality monitoring system can help in identifying the smoke concentration that correspondingly improves the health status of the people who are directly exposed to the smoke.

Mass public awareness on effect of indoor air pollution on health must be promoted.

Researches must be conducted to study the impact of air pollution in human health.

Separate kitchen with standard dimension and ventilation will help in minimizing the pollution and reduce the prevalence of disease caused by the same.

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ORIGINAL ARTICLE

Socio-economic conditions and life style related characteristics of tannery workers of Hazaribagh, Dhaka: A cross-sectional study

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ABSTRACT

Aims: To assess the socio-economic condition and life style related characteristics of tannery workers who have been working in the tannery area of Hazaribagh.

Methods: A cross-sectional studyfrom 1st May to 30th August of 2013 of 167 tannery workerswho had been employed for ≥ 2 years at leather tanneries of Hazaribagh,-Dhaka, was taken (from 10 different tanneries).Face to face interviews were performed using a semi-structured pre-tested questionnaire.

Results: Most of the respondents were male 96.4% (of 167) with mean age of 28.75±7.285 years. 53.3% had secondary education,43.1% had primary education, 2.4% were illiterate and 1.2%were graduate.About 44.3% of the respondents had BDT 7000-11000 of monthly income and 11.4% had BDT 2000-6000. Almost 34% of the respondents lived in Slum area. About 79% of the respondents were smoker and they were smoking for more than 5 years (57.6% of132).

Conclusion: This study measures the predominantfactors relating socio-economic conditions and life style of tannery workers.

Keywords: Bangladeshi Taka (BDT), Socio-economic condition, Tannery workers

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INTRODUCTION

Bangladesh has been developing its economy rapidly on market-based economy. It per capita income in 2012 was estimated to be US $ 2,100 and according to the International Monetary Fund, Bangladesh ranked as the 44th largest economy in the world in 2012 in purchasing power parity terms[1].Tannery sector plays a significant role in the economy of Bangladesh in terms of its contribution to export and domestic market [2].At almost $1 billion a year in sales, the leather industry is one of Bangladesh's most profitable sectors. Last year, it earned $451 million by exporting leather and leather products between July and December, an increase of about 20 per cent from the same period in 2011 [3].In Bangladesh, tanning or the process of making leather is mostly carried out in the south-western region of Dhaka city, occupying 25 hectares of land at Hazaribagh, where about 90% of tannery industries of Bangladesh are located [4].The homes of tannery workers in Hazaribagh are built next to contaminated streams, ponds, and canals. Informal leather recyclers who burn scraps of leather to produce a number of consumer products also heavily pollute the air and at least 160,000 people have become victims of pollution due to presence of toxic chemicals, mainly chromium [5]. Some of the worker started their work at the age of 13 and earn 6,000 BDT (100 USD) a month working for a 12-hour shift, seven days a week. They lived in a slum area and had to left school for this job [6].The World Health Organization says 90 per cent of Hazaribagh's tannery workers will die before age 50. Most will suffer respiratory illnesses. Most will have skin diseases and these tanneries are not only poisoning the people who live there but others, too, hundreds of miles away [3, 7].

The purpose of this study was to assess the socio-economic condition and life style related characteristics of the tannery workers who had been working for ≥ 2 years in tannery factory around Hazaribagh area, Dhaka.

METHODS

Sampling

This cross-sectional study was done in the Hazaribagh Industrial area of Dhaka city. It involved 167 tannery workers from 10 factories who had been working in the tannery for ≥ 2 years. All the leather factories that were in production during the field period of this research and granted permission for this research were included in the study. This amounted to 29% of the hide factories in the industrial zone.The purpose of the study was explained to the people involved in this study and was carried out between May 1 and August 30 in 2013.

Questionnaire

In order to determine the socio-economic conditions and life style related characteristics of 167 individuals, the following information was obtained through

face-to face interviews: their ages, religions, marital status, schooling level, monthly income (individual and family both), numbers of family members, living condition, smoking habit, habituation with Gaza (marijuana), previous jobs, working duration per day and duration of services. We also asked if they had shortness of breath and whether they ever fell in an any accident during the work.

Statistical analysis

Descriptive analysis was done to describe characteristics of our study population. Evaluation of different variables was made with a Chi-square test. Statistical significance was accepted for $P < 0.05$ for results that were two-tailed. All statistical analyses were performed using the Statistical Package for the Social Sciences (SPSS) version 16.0, (Chicago, USA).

RESULTS

The study group of 167 workers consisted of 161 (96.4%) males and 6 (3.6%) females. Mean (± SD) age (years) of respondents was 29 (± 7) with a median of 30. Among them 110 (65.9%) were married and 57 (34.1%) were unmarried. The mean income (Taka per month; One USD = 77.22 BDT) was 10733 ((± 3804) and median income was 10,000 BDT per month. Income ranged from 2,000 to 21,000 BDT per month and almost 44.3% of the workers had income between 7000-11000 BDT per month. Likewise the mean (± SD) monthly family income was 18281.44 (±5666.309) and median

Table 1:Distribution of socio-economic characteristics of leather tannery workers (respondents) of Hazaribagh, Dhaka-Bangladesh from 1st of May to 30th of August (n = 167)

Variables	n (%)	Mean ± SD
Age (in years)		
15-24	59 (35.3)	28.75±7.28
25-34	66 (39.5)	5
35-44	42 (25.1)	
Sex		
Male	161 (96.4)	
Female	6 (3.6)	
Marital status		
Married	110 (65.9)	
Unmarried	57 (34.1)	
Education		
Illiterate	4 (2.4)	
Primary	72 (43.1)	
Secondary	89 (53.3)	
Graduate	2 (1.2)	
Monthly Income (BDT)		
2000-6000	19 (11.4)	
7000-11000	74 (44.3)	10732.93±
12000-16000	70 (41.9)	
17000-21000	4 (2.4)	3803.683
Monthly Family Income (BDT)	19 (11.40)	18281.44±
5000-10000	49 (29.3)	5666.309
11000-16000	58 (34.7)	
17000-22000	35 (21.0)	
23000-28000	6 (3.6)	
29000-34000		
Number of Family Members	47 (28.1)	
1-4	114 (68.3)	
5-8	6 (3.6)	
9-12		
Living Condition		
Kacha House	3 (1.8)	
Tin Shed with wall	87 (52.1)	
Slum	57 (34.1)	
Building	20 (12.0)	
Living distance from workplace	6 (3.6)	
Far away	7 (4.2)	
5 miles or less	40 (24.0)	
1 miles or less	114 (68.3)	
Around		
Working Years in tannery	92 (55.1%)	
2-6	50 (29.9%)	
7-11	15 (9%)	
12-16	5 (3%)	
17-21	5 (3%)	
22-26		

family monthly income was 18,000 BDT. Income ranged from 2,000 to 34,000 BDT per month and almost 35% of the family had 17,000 to 22,000 BDT per month and 114 (68.3%) of the respondents had 5-8 family members. Approximately 53% of the workers had secondary education, 43% had primary education, only 1% were graduated and 2% were illiterate. The mean (± SD) duration of work (years) was 7 (± 5.054), and median duration was 6 years. Almost 114 (68.3%) lived around the tannery factoryand about 40 (24%) lived one mile or less distance from the tannery factory (Table 1).Almost 132 (79%) of the respondents were smoker and 76 (57.6%) were smoking for >5 years. The minimum number of cigarette they were taking per day was 1-6 for 12.1% of respondents and 25-30 cigarettes for 5.3% of respondents per day. 28.0% of the respondents had been taking cigarette for 3-5 years and about 38.6% of respondents had been taking 13-18 numbers of cigarettes per day. The present study also shows that 66.5% of respondentschewed betel nut and among them about 44.3%of them chewed it occasionally. Also about 8.4% of respondents were found habituated to Gaza (marijuana) and about 2.4% of the respondent took it occasionally (Table 2).

Table 2:Distribution of Life style related characteristics of leather tannery workers (respondents) of Hazaribagh, Dhaka-Bangladesh from 1st of May to 30th of August (n = 167)

Variables	n (%)
Smoking habit	
Yes	128 (76.6)
No	35 (21.0)
Occasionally	4 (2.4)
Duration of Smoking (Years)*	
2-3	19 (14.4)
3-5	37 (28.0)
>5	76 (57.6)
Cigarette taken per day*	
1-6	16 (12.1)
7-12	43 (32.6)
13-18	51 (38.6)
19-24	15 (11.4)
25-30	7 (5.3)
Betel nut chewing	
Yes	37 (22.2)
No	56 (33.5)
Occasionally	74 (44.3)
Smoking Gaza (Marijuana)	
Yes	14 (8.4)
No	149 (89.2)
Occasionally	4 (2.4)

*n=132

Table 3: Association between the socio-economic and life style related variables

S. N	Variables		P-value	95% Confident level	
				Lower limit	Upper limit
1	Monthly Family Income	Living Condition	0.002	0.008	0.064
2	Smoking Habit	Monthly Income	0.001	0.001	0.047
3	Duration of years of smoking	Breathing problem/ tightness of chest	0.000	0.000	0.018
4	Monthly Income	Duration of working years in tannery	0.000	0.000	0.018

The study reveals the significant association between the monthly family income and their living condition (P= 0.002 < 0.05). Also found smoking habit is significantly associated with monthly income (P=0.001 < 0.05) and there found no relation between education qualification of the workers and their monthly income (P= 0.132 > 0.05) (Table 3).

DISCUSSION

In this prevalence study, socio-economic conditions and life style related characteristics of tannery workers have researched. We looked particularly the associated variables that affect the socio-economic and life style related characters of the tannery workers of Hazaribagh, Dhaka. In the present study the mean age of the tannery workers was 28.75 ± 7. 285 years. The study in Turkey, the report of the Human Right Watch and another report from the Europe also supported the present study [8 -10].In this study out of 167 respondents 66% were married, majority of them had 6-10 years of education (secondary level 53.3%) and about 2.4% were illiterate, the income per month ranged from 2000 BDT- 21000 BDT (1 USD = 77.95 BDT) . The majority of the workers had income of 7000-11000 BDT. The mean income per month was 10732.92 BDT and SD was ±3803. 683. In a similar study in Pakistan-Karachi (n= 641), it was found that 51.3% were married and about 41.2% were illiterate as well 34.9% had 6-10 years of formal education. And the majority of the workers (48.7%) had monthly income of 3000-5000 rupees (1 USD = 60.25 Pak rupees) [11]. It showed that Bangladesh paid high salaries among the tannery workers than that of Pakistan and Bangladesh had high numbers of workers who are educated than that of Pakistan. This may be because of the population growth and the unemployment problem in Bangladesh which compelled those educated people to work in the tannery.Another article posted in The Guardian newspaper said that the workers in Hazaribagh were paid monthly wages of between 6000- 25000 BDT even though such salaried mean Labour costs in Bangladesh in about half of those in china and major competitor tannery of the south Asian state. And also there found the positive association between the duration of years of working in the tannery and monthly income (P-value =0. 000 <0.05) which may be the reason behind the difference in monthly income between the tannery workers of Bangladesh and Pakistan [12]. Also this study revealed the monthly income is not associated with their educational qualification (P-value =0. 132 >0.05) but with the years of experience.

The variation had found in the living condition between the Pakistani tannery worker and tannery workers of Bangladeshi which may be due to the Tin Shed with wall houses was whether defined and/or included in the category of Pacca house in the study of Pakistan [11].Almost about 75% of the workers have been working in the tannery for not more than 11 years in this study. Another similar study by CONTANCE in Europe revealed the similar result which supports this study [10].Majority of tannery

workers (about 79%) found active smoker and more than half of them were smoking for at least 5 years or more. The similar study in Turkey showed the high prevalence of smoker among the tannery workers [8]. This study also reveals the majority of the tannery workers chewed betel nut and some workers were even found habituated with Gaza (marijuana).

CONCLUSION

The socio-economic condition and life style related characters were associated with each other. Majority of them lived in the slum area within a mile or less from the working area which suggested that they had poor living condition and were in poor health due to their own bad habits and work related condition. More studies are needed to confirm the study findings and to protect the health and living condition of the tannery workers of Hazaribagh, Dhaka.

LIMITATION OF STUDY

The limitation of our study was that it was cross-sectional and therefore causality cannot be determined. The study population included workers form some selected tanneries; therefore, it may not be represented of all the workers of the tannery of Dhaka city and the situation may provide differing results if another timeframe had been chosen. Small sample size was also a major limitation of the study.

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REVIEW ARTICLE

Telemedicine and e-health in Nepal

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INTRODUCTION

Information systems support to reduce the disparity in health care that exist in urban and rural areas. It improves the health care services and coordination at different levels. Health information systems provide the tools to capture, store, process and communicate health care information .[1] Telemedicine and e-health is growing both in developed as well as in developing countries and has remained as an integral part of the health care delivery system. It includes different health activities and medical services that take place at a distance.[2] In the developing countries, it supports to improve the accessibility, quality and efficiency of the healthcare services and also reduces the cost of service.[2, 3] It also supports to improve the administrative as well as technical aspect of healthcare system. Similarly, it also supports to connect the healthcare facilities with the healthcare professionals and also reduce the geographical and physical barriers .[4] The World Health Organization (WHO) has mentioned tele-medicine and e-health as a possible information system that can improve the quality and reduce the cost of health care services.[5]

In developing countries there are various challenges to implement the telemedicine and e-health services. The study shows that mostly the human and organizational factors have remained as the barrier to effectively implement the telemedicine and e-health activities.[6] In rural areas there is scarcity of the health workers so while they get involved in the telemedicine and e-health activities it also increases their work burden.[1] Similarly, other factors such as lack of proper awareness of the technology, social and cultural environment and acceptance of service among the users, high staff turnover have remained as challenges.[7,8] Hence, to improve the status of telemedicine and e-health programs, the involved health workers should be well prepared and educated on the new technology and about its purpose and benefits.[1]

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Importance of Telemedicine and e-health in Nepal

Nepal is listed among one of the underdeveloped countries with low human development index, i.e. 0.540. [9] Geographically, most of its area is under hilly and mountainous region and 83% of its total population is still living in the rural areas. [10] In Nepal, both the public and private sector are involved in the delivery of health care services. However, most of the health facilities are located in the urban areas and health workers are also more willing to work in the urban areas due to the better incentives and other facilities that are more available in the urban areas as compared to rural.

In last fifteen year period (from 1995/1996 to 2010/2011) the incidence of chronic diseases has increased from 6% to 12% and the incidence of acute disease has also increased from 9% to 20% in Nepal.[11] Similarly, the scenario of disease in rural and urban area is also different. In rural Nepal, the prevalence of infectious diseases is more, whereas in urban and semi urban areas, peoples are facing a double burden of diseases (i.e. Communicable and non-communicable). The World Bank report shows that one-third of the people in the hilly region are living more than four hours away from an all-weather road.[12] Similarly 15 district headquarters still needs to be connected by a roadway system.[12] So the government has a challenge to overcome the poverty and geographical barriers to reach the rural peoples and provide them effective and affordable health care services.

The health system become effective in any country when it has sufficient skilled health workers and proper flow of health information, however these both aspects are inadequate in the context of Nepal. Although health is taken as a fundamental human right,[13] existing health indicators show that still the health services are not equitable for the peoples of all regions. National data shows that pregnant mothers who receives at least one antenatal care during their pregnancy from the skilled health worker is only 55% in the rural areas and 88% in the urban areas.[14] Similarly, other indicators also show the status of disparity in rural and urban area.

To address such issues, use of Information and Communication Technology (ICT) could be the best solution. Using of ICT provides opportunities to overcome such barriers and increase the options to deliver the health services.[3] So, the ICT has been taken as an integral part of the health care delivery system throughout the world. It has supported in the delivery of health care services, especially in the context where the health care providers are limited and the peoples living in communities doesn't have easy access to the health services. With this reference Government of Nepal has also implemented the rural-telemedicine program to support the healthcare delivery system. The main purpose of the program is to increase the accessibility of health service for the peoples living in the remote areas. Since there is a large proportion of the population living in the rural

areas that are deprived of the basic essential health care services, so the program will support to address their health problems. Similarly the program will also support to improve the utilization of health services among the rural people by increasing the accessibility, availability and affordability of the health services.

Rural-Telemedicine program in Nepal

The rural-telemedicine program was initially implemented in 25 district hospitals of hilly and mountainous districts (Achham, Bajhang, Bajura, Darchula, Jajarkot, Humla, Jumla, Kalikot, Rukum, Rolpa, Pyuthan, Dolpa, Mugu, Manang, Mustang, Gorkha, Dolakha, Rashuwa, Sindhuli, Sindhupalchowk, Khotang, Okhaldhunga, Sankhuwasabha, Solukhumbu and Taplejung), of Nepal from 22nd January 2011.[15] Similarly in the year 2012, government further extended the program in 5 more districts hospitals (i.e. Dailekh, Baitadi, Salyan, Dadeldhura and Doti). So, in the present context the rural-telemedicine program is implemented in total 30 districts out of 75 districts of the country.[16]

Presently, the rural-telemedicine program is using store and forward method, video-conferencing and telephone based consultation (i.e. hello-health). Telephone based consultation (i.e. hello-health) and store and forward method are used in most of the program implemented districts whereas video-conferencing is only used in three districts.

Store and forward: Medical support is provided through emails. This service is used in almost all of the involved districts. In the store and forward method, the medical officers or the health care providers working at the district hospital send the details of the patient through the email in an especial format designed for rural-telemedicine program. The sent mail is received at the Central Coordination Desk at Patan Hospital (tertiary level hospital) by the Medical Officers or by the Officers working at the desk. The e-mails are screened on the basis of the health problems and the specialist replies the concern mail with necessary suggestions and feedback.

Video-conferencing: This service has proven to be most effective for providing medical consultation to the patients and also for providing necessary medical assistance to the medical doctors and health workers. It is conducted only in three districts on a weekly basis, however, during emergencies and for special cases it is also conducted as needed. Video-conferencing is facing the problem due to the slow internet service and an interruption in the electricity which causes blurry images and unclear sound during the conference.

Telephone-based consultation "Hello-health": This service was started almost after two years of the initiation of rural - telemedicine program. Presently it provides 24 hour service to the peoples. "Hello-health" provides service on various health issues, but most notably cases are related to sexually transmitted diseases, medication pattern and general consultation. The service receives about 300 calls each day.

To manage the rural-telemedicine program activities at the district hospitals, government has provision to

trained at least 3 health personnel to function and support the ongoing telemedicine program activities.[15] To effectively conduct the rural-telemedicine program at the district hospitals, district telemedicine implementation sub-committee is formed by including nine members where the Medical Superintendent of the district hospital work as the coordinator of the team.[15] It is expected that the implementation of rural-telemedicine program will support to reach the unreached population of the country to deliver the health care service by combating the specialist inaccessibility issues. Similarly, it can be also taken as a proper solution for Nepal to overcome the various challenges that exist in the health care delivery system.

Further scope:

In a low-income country like Nepal, it is necessary to consider about the sustainability of the Telemedicine and e-health program. Similarly, it is important to accept and adjust to the growing technology to see its effectiveness in the delivery of health services. For Nepal, it is also challenge to match the stander of technology that is implanted at other part of the world. However in the context of developing countries, the low-cost telemedicine services are clinically useful, feasible, sustainable and replicable in the rural areas and underserved communities.[2]

Regarding the low-cost technology, implementation of m-health (especially mobile phone based interventions) could be more effective. Mobile phones are popular in rural communities since it is portable, small sized, low weight and rechargeable, long-life battery power which can also support during the irregular electricity.[17] Similarly use of m-health can also be effective for monitoring, surveillance, mass communication and for increasing access to information.[18]

In the context of Nepal the use of mobile phone in the health care delivery system is limited. In present scenario mobile phone based intervention has been initiated as a pilot project by government and few non-governmental organizations in limited areas. One of the study shows that there is a pilot intervention of m-health in the Gulmi District of Nepal, where the mid-level health workers were provided with a free phone number to consult with General practitioners (GPs) at the district hospital.[19] It has been also expected that the service will support the health workers in rural areas.[18] The study shows that the project has supported the mid-level health workers and patients mainly for consultation, in decision making while handling serious cases and for the referral of the patients.[19] However, the study have shown the need to scale-up the intervention to see its effectiveness.[19]

Studies have shown that, telemedicine and e-health services improve the equity of access to healthcare, decentralize the mode of health service delivery, effectively delivery of health services, improve the communication among the health personnel and improve the quality of service.[3] So in the context of Nepal also telemedicine is important to address these above mentioned aspects and to improve the overall status of health care delivery system.

CONCLUSION:

To improve and sustain the telemedicine and e-health activities in Nepal, it is necessary evaluate the existing ongoing services that are implemented by the government as well as other external development partners. It will support to find out the strengths and best practices of the program that can be replicated and will also support to find out the limitations which can be improved. Similarly the government should also focus on upgrading necessary infrastructure such as increase the band-width of the internet, ensure power back-up system and should also focus on the upgrading the existing equipments. Government also needs to focus on improving the motivational factors for the health workers to increase their engagement in the rural-telemedicine related activities. Similarly to increase the utilization of the existing services, it is also necessary to focus on the promotional activities and also to inform the community peoples about the existing services through mass media.

To improve the existing status of rural-telemedicine program, government should focus on forming the technically competent management team which can provide necessary managerial and technical support as well as will be accountable for the program related activities. Presently, the rural-telemedicine program doesn't have specific management team and is broadly managed under Logistic Management Division. Similarly the government should also focus on other challenges that are related with the regular fund to sustain the program activities, clear policy of government on telemedicine and e-health programs, trained and motivated human resources to get involved in the program activities, supportive infrastructure and technology, initiation for making the service interoperable at the national level and compatible with international stander and activities for increasing the community support for encouraging them to participate in the program activities.

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Tables and figures

- Number within specified limits.
- No repetition of data in tables/graphs and in text
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