ISSN 2645-873X (Print)
ISSN 2645-8748 (Online)

Vol.I, Issue I, 2018

THE CLIFF

Nursing Journal of
Kathmandu University

Yearly, Open Access
Peer Reviewed Journal

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SUBMISSION

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Nursing Research in Nepal: Trends and Way Forward

Pun KD

Nursing as a science is an evidence-based area of practice which began from the time of Florence Nightingale.[1] Substantial research findings are important these days upon which better nursing care can be built. Scientific evidence is mandatory to aid and improve nurses in various positions. The scope of nursing is ever widening from traditional hospital settings to decision making of health policy at the very top level.

Nursing research has grown greatly in the international arena largely due to more than ever before dedicated nurses evolving as keen researchers and significant number of nurses enrolling for doctoral degrees. Also it is of noteworthy that nurse researchers from around the world are disseminating their research findings in international scientific conferences and nursing journals.

With comparatively shorter nursing history than the Western world, Nepal has a long way to go in nursing research.[2] Formal training in nursing began in Nepal in 1956 AD, when the primary responsibility of nurses was perceived to be patient care only.[3] The scope of qualified nurse was limited to hospital settings only in the beginning however it gradually expanded to academia as nurse educators. The start of Bachelor program in nursing in 1977 by IOM and subsequently by various Nepalese universities in later decades became the impetus for nursing research since it was made a mandatory part of the degree.[4] With increase in understanding the importance of nursing research and the influence of global trends, nursing research started to garner interest and take root which now has potential to flourish with the offering of higher academic degrees like Masters and PhD in nursing by the Nepalese universities. Nepalese nurse researchers graduated both from within and outside the country are now seen enthusiastically involved in research.

No doubt motivation is a crucial factor for the success of any undertaking like conducting a research but other factors are of outmost important too, such as: availability of experts to supervise the research, support of the employer in terms of making resource material accessible, approval of leave etc. Short coming in these aspects has somewhat dampened the spirit of the eager nurse researchers. Critically analyzing the nursing research landscape of Nepal further, no or limited fund allocated for nursing research, greater workload and limited nursing journals in the country have undermined the potential of nurse researches in Nepal. If these obstacles are not addressed immediately and properly there is the danger of Nurses with Bachelor's degree taking research as just a partial fulfillment of their degree while those with postgraduate degrees and working in the academia, pursuing research activities only to fulfill their university's rules of professional advancement.

Looking at the way forward for nursing research, academic institutes need to come up with policy that facilitates leave sanctions, adjustment in workload, online journal and books along with strengthening resources in library. Further, wider motivating factors, specifically those that provide platform to share and learn research skill and knowledge, need to be explored to encourage nursing research in Nepal. Conferences, trainings on scientific research, fund allocation for nursing research and foreign collaboration to keep up to global trend are needed in significant frequency and amount to move forward. Publication of journals focusing on nursing research is mandatory. A few institutions including the Nepal Nursing Council have already started publishing nursing journals for Nepalese nurses to disseminate their research findings.

Acknowledging the importance of this fact, Kathmandu University is committed to enhance nursing researches. It has successfully organized first and second international nursing conferences in 2014 and 2018 respectively. These two conferences had become the meeting ground for national and international nurse researchers to share research findings and establish network for collaboration in future projects and also had published the proceeding of the conference as the journal.

As its continued efforts to encourage our nurse researchers, Kathmandu University is publishing its very first issue of the open access peer reviewed nursing journal. To share and be part of our success in this new endeavour, we welcome any constructive suggestion and criticism from all those who are interested.

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A Comparative Study to Assess the Caregiving Burden, Stress and Health Effects among the Primary Care Givers of Children with Acute Leukemia, Children with Chronic Illness and Normal Children

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Citation

Manandhar S, Sharma KK, Bakhshi S, Kabra S. A Comparative Study to Assess the Caregiving Burden, Stress and Health Effects among the Primary Care Givers of Children with Acute Leukemia, Children with Chronic Illness and Normal Children. *THE CLIFF.* 2018; 1: 3-8.

ABSTRACT

Background

Evidence suggests that parents of children with cancer report poorer health compared to parents of healthy children.

Objective

To compare the burden, stress and health effects among primary caregivers of children with leukemia, children with chronic illness (asthma) and normal children.

Method

This cross sectional descriptive study was conducted among ninety primary caregivers, thirty from each group i.e. primary caregivers of children with leukemia, asthma and normal children selected by convenient sampling. Caregiving Burden Scale, Perceived Stress Scale and SF-36 Questionnaire were used to assess the caregiving burden, stress and health effects among primary caregivers respectively.

Result

There was significantly higher level of burden and stress among caregivers of children with leukemia than caregivers of other groups ($p<0.05$). Among the caregivers there were significantly negative correlation of burden and stress with health effect ($p<0.05$). There was significantly poor health status (all domains)among caregivers of children with leukemia in comparison with caregivers of normal children while there was lower social functioning, higher role limitations due to physical health and role limitations due to emotional problem as compared to asthma group.

Conclusion

The caregivers of children with leukemia have significantly higher burden and stress as compared to caregivers of children with chronic illness and normal children. There is significant negative correlation of caregiving burden and stress with their health effects.

KEY WORDS

Care-giving burden, Chronic disease, Health effect, Stress

INTRODUCTION

The cancer patients need numerous activities pertaining management which affects patients as well as caregivers. Usually the health care providers fail to acknowledge that caregivers are going through a painful process too and need help and support.[1]

Unlike professional caregivers such as nurses, informal caregivers, typically family members, provide care to individuals with a variety of conditions, most commonly advanced age, dementia, and cancer.[2] Compared with non-caregivers, caregivers often experience psychological, behavioral, and physiological effects.[3]

There has been increasing consensus regarding the importance of understanding the needs of the entire family throughout the experience of childhood cancer.[4] Caregivers of cancer report worse quality of life, compared to caregivers of healthy children.[5]

The evidence is insufficient in published literature about the caregiving burden, stress and health effects among caregivers with children with leukemia. Proper and quick appraisal, care planning, service referral, and follow-up have the potential to reduce the stress of providing care so that caregivers are able to continue in their role without sacrificing their own health and well-being. It's important to identify the specific problems, needs, strengths of the family caregiver and the ability of the caregiver to contribute to the needs of the care recipient.

In view of these needs, this study was conducted to assess the burden, stress and health effects among primary caregivers of children with acute leukemia, to compare the same among primary caregivers of children with chronic illness and normal children and to determine the association between caregiving burden and stress with the health effect of the primary caregivers.

METHODS

This quantitative, comparative, cross- sectional study was conducted in Medical Oncology ward, Pediatric Oncology OPD, Dr. Bhim Rao Ambedker Institute, Rotary Cancer Hospital (BRAIRCH), Pediatric Day Care Unit and Pediatric Chest Clinic of All India Institute of Medical Sciences (AIIMS), New Delhi.

Data was collected using face to face interview with primary caregivers who came for the treatment of their children with acute leukemia and asthma; and care givers of normal children from urban community Ambedker Nagar during June 2015 - December 2015. Ethical clearance was obtained from the Ethics Committee of the institution.

After informed consent, caregivers of children aged 5 to 10 years, diagnosed with acute lymphoblastic leukemia or with moderate to severe persistent asthma for at least three months prior to the initiation of the study or with normal health, aged between 18 years to 40 years, willing to give informed consent and could understand Hindi or English were included in the study. A total of 90 subjects were recruited (30 in each group) using convenience sampling. Demographic profile and child characteristics were obtained. Structured questionnaire to assess burden, stress and health effects of primary care givers were administered (30 min) to all participants.

Questionnaire for demographic profile and child characteristics were developed by the researcher after extensive literature review and consultation with experts. Caregiver burden scale given by Zariet et al. 1980 was used for measuring level of care giver's burden and the word 'child' had been replaced instead of 'relatives' according to the need of the study.[6] It consists of 22 items, each having five options such as: Never=0, Rarely=1, Sometimes=2, Frequently=3, Nearly always=4. Cohen- perceived stress scale was used to assess stress level of the caregivers. It consists of 10 items: 6 items are negatively worded and 4 items are positively worded. Each item was rated on a 5point scale ranging from never (0) to almost always (4). Positively worded items were reverse scored and ratings were summed with higher scores indicating more perceived stress. SF-36 Questionnaire was used to assess the health effect which consists of 36 questions scored on a scale 0 to 100. Aggregate scores were compiled as a percentage of the total points possible. It consists of eight health concepts. Content validity and reliability of the tools were established before use. Permission was obtained for using the tools and confidentiality of information was maintained. Mean, standard deviation and frequency were used for descriptive statistics. One-way-Anova test was used for comparisons of groups. Data analysis was done using STATA 11 version.

RESULTS

The mean age of primary caregivers of children with leukemia was 33.85±4.57 years, with asthma was 34.46 ±5.22 years and those with normal children was 30.6±5.17 years. Majority of primary caregivers of children were females. Most of primary caregivers in leukemia group (66.7%) were from rural area. Majority caregivers were married and belonged to Hindu religion. About one fourth (26.7%) caregivers from leukemia group were illiterate while 30% caregivers from asthma group were graduates.

Among caregivers of children with leukemia 86.7% had received help for the caring their children, 93.3% of them had been absent from their work/job for the treatment of their children. Among the caregivers of children with asthma, 46.7% of caregivers were on routine medicines and 36.7% had consulted a physician thrice in the last year.

The mean age of children with leukemia was 7.76±1.85 years, with asthma was 8.3±1.70 years and of normal children was 6.9±1.76 years. Majority of children were

Table 1. Socio demographic characteristics of the primary caregivers (n=90)

Variables		Study Groups		
Age(in years)		**Leukemia**	**Asthma**	**Normal**
		32.83±4.57	34.46±5.22	30.6±5.17
Gender	Male	13(43.33%)	13(43.33%)	4(13.33%)
	Female	17(56.67%)	17(56.67%)	26(86.67%)
Place of Stay	Rural	20(66.67%)	11(36.67%)	5(16.67%)
	Urban	10(33.33%)	19(63.33%)	25(83.33%)
Marital Status	Married	30(100%)	29(96.67%)	29(96.67%)
	Unmarried	-	1 (3.33%)	-
	Widow	-	-	1(3.33%)
Religion	Hindu	26(86.67%)	27(90%)	28(93.33%)
	Muslim	4(13.33%)	2(6.67%)	1(3.33%)
	Others	-	1(3.37%)	1(3.33%)
Education Status	Illiterate	8(26.67%)	2(6.67%)	5(16.67%)
	Up to 10th	14(46.67%)	11(36.67%)	18(60%)
	Up to 12th	7 (23.33%)	5 (16.67%)	3(10%)
	Graduate	1 (3.33%)	9 (30%)	1(3.33%)
	Postgraduate	-	3 (10%)	3(10%)
Occupation	Homemaker	12 (40%)	13(43.33%)	18(60%)
	Unemployed	-	1(3.33%)	SS
	Employed	5(16.67%)	11(36.67%)	11(36.67%)
	Autonomous	13(43.33%)	5(16.67%)	1(3.33%)
Financial Assistance	Yes	26(86.67%)	14(46.67%)	8(26.67%)
	No	4(13.33%)	16(53.33%)	22(73.33%)
Absent from Work/ job	Yes	28(93.33%)	23(76.67%)	16(53.33%)
	No	2(6.67%)	7(23.33%)	14(46.67%)
Presence of health problem	Yes	6(20%)	14(46.67%)	6(20%)
	No	24(80%)	16(53.33%)	24(80%)
Takes routine medicines	Yes	4(13%)	14(46.67%)	6(20%)
	No	26(86.67%)	16(53.33%)	24(80%)
Consulted a physician in the last year	Not	24(80%)	11(36.67%)	20(66.67%)
	Once	5(16.67%)	4(13.33%)	4(13.33%)
	Twice	-	3(10%)	1(3.33%)
	Thrice	-	11(36.67%)	-
	More than	1(3.33%)	1(3.33%)	5(16.67%)
No. of Children	1	3(10%)	1(3.33%)	7(23.33%)
	2	10(33.33%)	23(76.67%)	11(36.67%)
	3	9(30%)	5(16.67%)	9(30%)
	4 and more	8(26.67%)	1(3.33%)	3(10%)
Any illness in siblings	Yes	1(3.33%)	8 (26.67%)	3(10%)
	No	29(96.67%)	22(73.33%)	27(90%)
Age (in years)	Mean±SD	7.76±1.85	8.3±1.70	6.9±1.76
Gender	Male	25(83.33%)	23(76.67%)	20(66.67%)
	Female	5 (16.67%)	7(23.33%)	10(33.33%)

boys with 83.33%(leukemia), 76.67% (asthma) and 66.67% (normal).

There was a negative correlation between burden with role limitation due to physical health, role limitation due to emotional problem, emotional well-being and social functioning (r= -0.516, r= -0.558, r= -0.639 and r= -0.616 respectively) while there was weak negative correlation with rest of domains in all the caregivers of three groups. There was strong negative correlation between stress and all domains of health effects in all the caregivers of three groups.

Table 2. Correlation of caregiving burden and perceived stress with health effects of the primary caregivers (n=90)

Variables	Caregiving burden		Perceived Stress	
Health Effect (SF 36):	**r**	**p value**	**r**	**p value**
1. Physical Functioning€	-0.403	0.001**	-0.591	0.001**
2. Role limitations due to physical health£	-0.516	0.001**	-0.622	0.001**
3. Role limitations due to emotional Problem£	-0.558	0.001**	-0.649	0.001**
4. Energy/ Fatigue€	-0.373	0.003**	-0.549	0.001**
5. Emotional Well- being€	-0.639	0.001**	-0.679	0.001**
6. Social functioning€	-0.616	0.001**	-0.619	0.001**
7. Pain€	-0.438	0.001**	-0.559	0.001**
8. General Health£	-0.432	0.001**	-0.646	0.001**

€=Pearson correlation test, £= Spearman test *p< 0.05, **p< 0.001

In leukemia group there was weak negative correlation between burden and health effects (r=<-0.5) which reported significantly higher role limitation due to physical health, lower emotional well- being and social functioning (p=<0.05).

In asthma group, there was strong negative correlation between burden and physical functioning, energy/ fatigue, emotional well- being, social functioning and pain (r=>-0.5) which reported significantly lower physical functioning, emotional well- being, social functioning, and general health and more pain (p=<0.05).

In normal group of caregivers, a strong correlation of burden with physical functioning, emotional well-being was found(r= -0.663 and r= -0.532 respectively) which shows significantly lower physical functioning, emotional well-being and general health (p=<0.05).

Among caregivers of children with leukemia there was strong negative correlation between stress and pain (r= -0.554) and general health (r= -0.595) which reported significantly more pain (p=0.001) and lower general health (p=0.005).

Among the caregivers of children with asthma there was strong negative correlation between stress and all domains of health effects (r= ->0.5) which suggests significantly poor health status (p=<0.01).

Table 3. **Correlation between burden and perceived stress with health effects of the primary caregivers in each group (children with leukemia, asthma and normal children) (n=90)**

Variables	Caregiving Burden						Perceived Stress					
	Leukemia(n=30)		Asthma (n=30)		Normal (n=30)		Leukemia(n=30)		Asthma(n=30)		Normal (n=30)	
	r	p value	r	p value	r	p value	r	p value	r	p value	r	p value
Health Effect(SF36):												
1. Physical Functioning€	-0.16	0.391	-0.53	0.003**	-0.66	0.001**	-0.22	0.25	-0.75	0.001**	-0.57	0.009**
2. Role limitations due to physical health£	-0.42	0.022*	-0.35	0.059	-0.13	0.5	-0.5	0.005**	-0.68	0.005**	-0.34	0.071
3. Role limitations due to emotional Problem£	-0.32	0.089	-0.3	0.107	-0.17	0.357	-0.26	0.173	-0.77	0.001**	-0.44	0.015*
4. Energy/ Fatigue€	-0.05	0.793	-0.56	0.001**	-0.11	0.56	-0.28	0.133	-0.71	0.001**	-0.38	0.039*
5. Emotional Well- being€	-0.43	0.017*	-0.66	0.001**	-0.53	0.003**	-0.28	0.132	-0.72	0.001**	-0.68	0.001**
6. Social functioning€	-0.48	0.008*	-0.71	0.001**	-0.15	0.416	-0.45	0.013*	-0.77	0.001**	-0.24	0.192
7. Pain€	-0.26	0.159	-0.59	0.007**	-0.19	0.326	-0.55	0.001**	-0.6	0.005**	-0.3	0.109
8. General Health£	-0.22	0.242	-0.37	0.042*	-0.43	0.017*	-0.6	0.005**	-0.76	0.001**	-0.41	0.025*

€=Pearson correlation test, £=Spearman test, *p< 0.05, **p< 0.01

Table 4. **Comparisons of caregiving burden, stress and health effects by group (n=90)**

Variables	Study Groups				Post hoc comparison p-value		
	Leukemia (n=30) mean ± S.D	Asthma (n=30)	Normal Children (n=30)	p value	Leukemia VS Normal	Leukemia Vs Asthma	Asthma VS Normal
Burden	55.733+13.51	31.96+16.67	29.93+10.73	0.001**	0.001**	0.001**	1.00
Stress	23.46 + 6.27	18.6 + 9.49	15.53+ 6.48	0.005**	0.001**	0.044 *	0.360
Health Effect (SF 36):							
1.Physical¥Functioning	73.2+16.10	71.5 +25.80	83.51+12.16	0.328*	0.111 *	1.00	0.048*
2. Energy/ Fatigue¥	56.7+17.92	64.33+20.95	67.5+15.96	0.069	0.075 *	0.33	1.00
3.Emotional Well- being¥	56.53 +15.32	68.4 +27.97	78.26+15.24	0.004**	0.001**	0.081	0.194
4. Social functioning¥	58.75+27.29	74.16+25.41	88.33+17.65	0.001**	0.001**	0.042 *	0.071*
5. Pain¥	52.58+28.93	58.75+29.03	72.66+20.09	0.013*	0.012 *	1.00	0.132
6. Role limitationsdue to physical health#	0 (0-100)	75 (0-100)	87.5 (0-100)	0.001**	0.001**	0.005**	0.272
7. Role limitations due to emotional Problem#	0 (0-100)	66.66 (0-100)	100 (0-100)	0.001**	0.001**	0.001**	0.23
8. GeneralHealth#	52.7 (0-85)	70 (0-95)	72.5(0-85)	0.033*	0.007 **	0.144	0.268

#data represented in median (min-max) and kruskalwallis test followed by multiple comparison using Wilcoxon ranksum test with bonferroni correction was applied, ¥One wayAnova corrected with Bonferroni test, *p<0.05

Among the caregivers of normal children, a strong negative correlation of stress was found with physical functioning (r=-0.573) and emotional well-being (r=-0.676) which shows a significantly lower physical functioning and emotional well-being (p=<0.01).

The mean scores of burden and stress among caregivers of children with leukemia group was 55.733±13.51 and 23.46±6.27 respectively which were significantly higher than caregivers of children with asthma and normal children (p=<0.01). It implies higher burden and stress among caregivers of children with leukemia in comparison with other groups while there was no significant differences in burden and stress among caregivers of children with asthma and normal with p=1.00 and p=0.360 respectively.

The mean score of physical functioning, emotional well-being, social function, pain of primary caregivers of children with leukemia are 73.2±16.10, 56.53±15.32, 58.75±27.29 and 52.58±28.93 respectively and the median value of role limitation due to physical health, role limitation due to emotional problem and general health was 0(0-100), 0(0-100) and 52.7(0-85) respectively which were significantly lower than caregivers of children with asthma and normal children with p= <0.05.

There was significantly poor health status among caregivers of children with leukemia in comparison with caregivers of normal children (p=<0.05) and lower social functioning (p=0.04), higher role limitations due to physical health (p=0.005) and role limitations due to emotional problem

(p=0.001) among caregivers of children with leukemia as compared to children with asthma.

There was significantly lower physical functioning (p=0.048) and social functioning (p=0.071) among the primary caregivers of children with asthma than normal children.

DISCUSSION

The present study results permit a broad discussion on how the cancer diagnosis and its care in children affect caregivers' lives. The caregivers' average age is 33 years with SD±4.57. Studies demonstrate that, when one of the children has cancer, employment contacts are broken due to the need to organize for child care and treatment, compromising family income, many caregivers end up losing their job after the diagnosis, due to the difficulty to balance care and work activities.[7,8] In this back drop present findings on need to remain absent from work as needed during hospitalization or follow up visits, etc. among the caregivers of children with leukemia (93.3%) and children with asthma (76.7%) is understandable.

In this study, 20% caregivers of children with leukemia mentioned some health problems and 16.7% had sought medical care at least once in the last year. Among caregivers of children with asthma, 46.67% mentioned some health problem and 36.67% had sought medical care at least thrice in the last one year. The data of caregivers of children with leukemia is comparable to findings of cross-sectional study done in Brazil, who reported that 21.9% of caregivers mentioned some health problem, 15.6% took medication regularly and 62.5% had sought medical care at least once in the last year.[1] However, the age group of children in the present study was 5-10 (average=7.76 years) years while it was 2-17 years in the cross-sectional study done in Brazil.[1]

In this study the health effects of primary caregivers of children with leukemia indicated compromise of all the dimensions of SF-36 (p= 0.05). Another study using SF-36 indicated compromise of the role limitations due to emotional problems (48.09%), vitality (61.84%), mental health (62.62%) and role limitations due to physical health (66.09%) among caregivers of children with cancer.[9] In the study of German which was done to see the impact of diagnosis, caregivers of children with cancer reported lower quality of life compared with caregivers of children with diabetes or epilepsy.[10]

There is evidence of a negative and statistically significant correlation among: general perceived health, mental health and emotional role functioning (SF-36) and the caregiver burden among caregivers of young epilepsy patients.[11]

In present study there was a significantly negative correlation between stress and some of the SF-36 domains. Higher score of stress showed poor health status of caregivers of children with leukemia (p=<0.05). Research suggests that caregivers may experience direct and indirect physical health consequences, higher levels of stress hormones and poorer sleep quality.[12,13] Comparable to present study, the results of a meta-analytic review indicated that caregivers of children with chronic illness endorse greater general parenting stress than caregivers of healthy children.

In the present study, there was significantly poor health status among caregivers of children with leukemia in comparison with caregivers of normal children (p=<0.05). There was significantly lower social functioning (p=0.04), higher role limitations due to physical health (p=0.005) and role limitations due to emotional problem (p=0.001) among caregivers of children with leukemia than children with asthma. Similarly, a study involving mothers to children with leukemia and control group in Japan, reported lower scores on all SF-36 domains than in the control group, with statistically significant results in 5 out of 8 domains.[14]

Comparative research involving caregivers of children with leukemia and other cancers are needed with a view to further clarify about the burden, stress, and health effects of this population and to support prevention and health promotion measures.

CONCLUSION

There was significantly higher level of burden, stress and poor health status among caregivers of children with leukemia than caregivers of children with asthma and normal children. These alterations may lead to further imbalances in their own health and affect the quality of care provided to children.

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Knowledge and Practice on Preventive Measures of Bird Flu among the Poultry Workers at Kaski, Nepal

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Ghimire GD, Poudel A. Knowledge and Practice on Preventive Measures of Bird Flu among the Poultry Workers at Kaski, Nepal. *THE CLIFF.* 2018; 1: 9-13.

ABSTRACT

Background

Nepal was free from highly pathogenic avian influenza (HPAI) until early 2009 January. The poultry workers are the first personnel to whom the bird flu can be transmitted.

Objective

To identify knowledge and practice on preventive measures of bird flu among poultry workers.

Method

A cross-sectional descriptive method was used. The study samples were 112 poultry workers of randomly selected poultry farms of Pokhara sub-metropolitan city and Lekhnath Municipality at Kaski District and convenience sampling technique was used for data collection. Semi- structured interview schedule and observation checklist were used for data collection. Both descriptive and inferential statistics (chi-square test) were used for data analysis.

Result

More than half (56.3%) of the respondents were males and 55.4% belonged to the age group of 25 to 39 years with mean age 34.11±9.76 years. Respondents having adequate knowledge on bird flu and its preventive measures were 50% while respondents having adequate practice on preventive measures were 55.4%. The most common personal protective measures used by respondents was hand washing with soap and water (94.6%).

Conclusion

It can be concluded that the practice level was found relatively better than the knowledge of respondents. Based on findings, it seems that there is still a room for improvement on knowledge and practices on preventive measures of bird flu. So the awareness programme on preventive measures of bird flu can be launched by using mass media.

KEY WORDS

Bird flu, Poultry worker, Preventive measures

INTRODUCTION

Avian influenza, an infectious disease of birds caused by strains of influenza virus type A, was identified first in Italy in 1878.[1] The Avian influenza subtype H5N1 is a highly pathogenic strain of the virus that has been confirmed in poultry populations across Asia. Backyard poultry is widely prevalent in almost all parts of the country whereas commercial poultry are mostly concentrated in the urban and semi urban areas that are equipped with electricity and road facilities. Nepal's open border with India and illegal trades of poultry and poultry products in the cross border areas has posed a serious threat. Widely prevalent backyard poultry farming systems, haphazard live poultry markets and weak bio-security measures in the commercial holding together with minimal awareness among the farmers, stakeholders and ordinary people are our greatest challenge.[2]

Prevention and control planning have to take account of the whole population, but there are subgroups which are particularly critical, such as poultry farmers, who are among those first in line when it comes to risk of contracting Avian influenza (AI).[3] Also they are expected to be a bridging population in terms of cross-species sharing of viruses and of spreading the disease into their local communities.[4] In Pokhara valley, there is a practice of importing chickens in poultry farm from outside the valley which may act as the risk factor of exposure. So, present study was conducted with the objective of assessing the knowledge and practice on preventive measures of bird flu among poultry workers.

METHODS

A cross-sectional descriptive study design was used to find out the knowledge and practice on preventive measures of bird flu among poultry workers in selected poultry farms in Kaski. The study samples were 112 poultry workers of selected poultry farms. The sample size of the study was estimated at 95% confidence level and 5% allowable error. Sample was calculated by standard formula on the basis of prevalence of knowledge 70%.[5] By Cochran formula, Sample size (n) $=z^2 pq/d^2 = 323$. Then, among the 150 total farms who met the inclusion criteria, the final sample size was $n/1+n/N = 102.5$. Then adding 10% non-response rate, final sample size was 112.

To get these samples, Pokhara sub-metropolitan City and Lekhnath Municipality were purposively selected. There were total 150 farms which met the inclusion criteria and fifty farms were selected by lottery method among the total of farms. Then total enumeration of each poultry worker of poultry farm of selected farms was done to get data. This method was adapted because of unavailability of the complete list of sample, time and cost feasibility.

The poultry workers who were veterinary professional or who were having less than 500 poultry in their farm and poultry owners who were not working in the farms as a worker, were excluded from the study. Likewise, poultry workers who were not in the farms during the period of data collection and un-cooperative workers who expressed their unwillingness to participate were also excluded from the study. Semi-structured interview schedule and observation checklist were developed with the help of the review of literature and informational book about bird flu published by Avian Influenza Control Project, Government of Nepal to assess knowledge and practice on preventive measures of bird flu. The interview schedule was divided into three parts. Part I of interview schedule consisted of information related to socio-demographic variables. Part II consisted of the knowledge questionnaire to assess the knowledge of poultry workers regarding bird flu. Part III consisted of questionnaire related to practice of preventive measures and Part IV consisted of observation check list for observing the use of personal protective measures at work.

The content validity of the instruments was maintained through consultation with research experts and subject experts. The instruments were translated into Nepali language and opinion of the concerned language experts was obtained for comprehensibility and simplicity of the language. Back translation into Nepali version was done to maintain validity of the instrument. Pretesting of the instrument was done among 10% of sample size in Kathmandu. On the basis of the pretesting instrument was revised to enhance its clarity and comprehension and finalized.

In this study, there were total fourteen questions related to knowledge and forty-four responses of them to measure the respondent's knowledge score of bird flu and its prevention. These were assessed for correctness and graded. For each correct answer, 1 score was given and the total score was forty-four. Level of knowledge was categorized according to obtained scored by the respondents.

Similarly, level of practice was categorized according to score obtained by combining the practice questions with direct observation of certain personal protective measures practices. There were eleven questions regarding respondents' practices and 2 points were given for "always practice", 1 point for "sometimes practice" and 0 for "never" with a possible maximum score of 22 and minimum score 0, while there were eight items on direct observation for assessing the personal protective measures such as use of gloves, boot, separate clothing, apron, eye glass, cap, mask and hand washing with a possible maximum score of 8 and minimum score of 0. Therefore, the total possible score for practice that may be attained by the respondent was a maximum of 30 and minimum of 0.

Data were collected after getting approval from the research committee of Lalitpur Nursing campus and Institutional Review Board, Tribhuvan University, Institute Of Medicine and Nepal Health Research Council, Nepal. Then, administrative letter along with copy of approved

instrument was submitted to the District Poultry Farmer's Association, Kaski. After getting their permission, residences having poultry farms were identified by help of the Chair person of District Poultry Farmers' Association, Kaski. Informed verbal consent was taken from poultry workers after explaining the purposes of the study prior to data collection. But the purpose was not explained before observation of personal protective practices considering that the study subject may change their behavior if they know somebody is observing. Data collection period was 17th April, 2014 to 16th May, 2014. Privacy was maintained while collecting the data. Confidentiality was ensured by not revealing the information received and personal identity of the respondents and using the information only for the purpose of the study. Workers were allowed to refuse to participate in the study at any time as they wish. The data were entered in the Statistical Package for Social Sciences (SPSS) version 20 and data cleansing was done. The data collected were analyzed by using descriptive statistics such as frequency, mean, standard deviation and inferential statistics and chi square test was used to identify association between knowledge and preventive practices regarding bird flu.

RESULTS

Table 1 shows that more than half of the respondents were males i.e 56.3% and 55.4% were within the age group of 25-39 years with the mean age 34.11 years with standard deviation 9.76. Similarly, a vast majority of the respondents (95.5%) were literate, majority of the respondents (70.5%) had up to 5 years experience in poultry work and more than half (58.9%) respondents had average working hours up to 8 hours per day in the poultry farm.

Table 2 illustrates the findings regarding the knowledge score of the respondents. Out of total knowledge score of 44, the mean was 22.15 with standard deviation of 6.38 and the minimum and maximum score ranged from 6 to 38. Half of total respondents (50%) had adequate knowledge (average or above average) and remaining half (50%) had lower knowledge (below average).

Table 3 presents the respondents' practices on personal protective measures while working in the farm which shows that most of the respondents (94.6%) had performed hand washing with soap and water after finishing the work in the farm. Ninety one percent had used face mask, 77.5% used boot while working, nearly half percentage (50.5%) had used gloves during handling poultry, 45.9% of respondents had worn separate clothing during working in the farm. Likewise, 29.7% had used cap, 27.1% had used apron and only 4.5% used eye glass during their work. Hence, there was no 100% practice even in a single protective measure used by respondents.

Table 4 shows the findings regarding the practice score on preventive measures of bird flu among poultry workers.

Table 1. Background characteristics of the respondents (n=112)

Characteristics	Frequency	Percentage
Sex of the Respondents		
Male	63	56.3
Female	49	43.8
Age (in years)		
15-24	18	16.1
25-39	62	55.4
40 & more	32	28.6
Mean age±SD = 34.11±9.76		
Literacy status		
Literate	107	95.5
Illiterate	5	4.5
Duration of Experience		
Up to 5 years	79	70.5
Above 5 years	33	29.5
Working Hours per Day		
Up to 8 hrs	66	58.9
Above 8 hrs	46	41.1

Table 2. Respondents' knowledge level on bird flu (n=112)

Knowledge Level	Frequency	Percentage
Lower knowledge (< 22.15)	56	50.0
Higher knowledge (≥ 22.15)	56	50.0
Mean score ± SD	22.15 ±6.38	

Table 3. Respondents' practice on personal protective measures (n=112)

*Observed Practices	Frequency	Percentage
Use of Apron	30	27.0
Use of Cap	33	29.7
Use of Gloves	56	50.5
Use of Mask	101	91.0
Use of Boot	86	77.5
Use of Eye glass	5	4.5
Use of Separate clothing	51	45.9
Hand washing with soap and water	105	94.6

*Multiple responses

Table 4. Respondents' practice level on preventive measures of bird flu (n=112)

Practice Level	Frequency	Percentage
Inadequate Practice (<20.57)	50	44.6
Adequate Practice (≥20.57)	62	55.4
Mean score ± SD 20.57 ±4.67		

Out of total practice score of 30, the mean was 20.57 with Standard Deviation of 4.67 and the minimum and maximum score ranged from 8 to 29. Majority of respondents (55.4%) had adequate practice (average or above average) and remaining 44.6% had inadequate practice (below average).

Table 5. Association between knowledge level and practice of respondents (n=112)

Variables	Higher Knowledge	Lower Knowledge	χ^2	p-value
	f (%)	f (%)	11.706	0.001*
Adequate Practice	40(64.5)	22(35.5)		
Inadequate Practice	16(32)	34(68)		

Chi-square test = * p≤0.05= statistically significant values

Table 5 depicts that there is significant association between knowledge of bird flu and practice of preventive measures of bird flu among respondents (p=0.001). Respondents who had higher knowledge on bird flu had practiced preventive measures of bird flu adequately and who had lower knowledge, also had inadequate practice.

DISCUSSION

In this study, most of the respondents (91%) answered that face mask should be used to prevent bird flu while working with poultry, and also same percentages (91%) were practicing it. It might be very easy method of prevention for them. This result is different from the other study that 53.1% had knowledge on it but only 27.1% were using mask while working in farm.[6] Likewise, most of the respondents (83%) mentioned that wearing boot is important to protect themselves from bird flu where as 77.5% were practicing it. In contrast with this result, there were only 15.6% who reported boot as preventive measure and only 7.3% were using boots.[6] Similarly, of the majority of respondents (74.1%) reported that separate clothing must be worn while working in the farm but only 45.9% had used in the practice which might be due to the unavailability of the protective equipments for practice. This result is supported by the study findings of Aly et al. in which 44.8% wore separate dress and apron.[7] In a study done in Nigeria, it was revealed that 70.5% adopted hand washing with soap and water as preventive measure.[8] Whereas in present study, most of the respondents (94.6%) were practicing hand washing with soap and water though only 69.6% had knowledge on it. This result gives an idea that the poultry workers who had lower knowledge were also doing good practice of hand washing. Likewise, regarding using gloves, 68.8% knew that it is necessary protective measure while half of them (50.5%) had been using it in practice. This might be due to their perception that wearing gloves is time consuming. This result is different from the findings of Aly et al. that only 30.5% of respondents wore gloves in practice.[7]

The study result revealed that half (50%) of respondents had higher knowledge and remaining half (50%) had lower knowledge whereas a according to a cross-sectional study conducted in Bhaktapur revealed that 70.8% of the respondents were aware about the preventive measures of avian influenza.[5] Similarly, a study also revealed that nearly two-thirds (61.3%) of the respondents had poor knowledge about AI.[12] In this study, although more than half (55.4%) had adequate practice and 50% respondents had adequate knowledge, it shows that there is need for immense improvement on knowledge of preventive measures of bird flu which can be attained by various community level awareness programs and training to be organized by poultry owner.

Regarding association between overall knowledge and practices of respondents, there was significant association (p= 0.001) between knowledge and practice of preventive measures of bird flu. So workers' practice is dependent on their knowledge. This finding is nearly different from the finding of Musa et al. that the practice of poultry workers was very high with little knowledge.[11]

CONCLUSION

It can be concluded that the practice level was found relatively better than the knowledge of respondents. The association between knowledge and practice is statistically significant so practice of poultry worker on preventive measures of bird flu was depended on their knowledge. Based on findings, it seems that there is still a room for improvement on knowledge and practices on preventive measures of bird flu. So the awareness program on preventive measures of bird flu can be launched by using mass media. Observation has been done in only some feasible practices which might reduce the generalizability of the result.

The results will also be applicable to the veterinary and health care planner and policy maker to plan and implement the program to improve knowledge and practice of worker for controlling the outbreak and spreading to human beings. Furthermore, the findings will serve as a base for future research in this area. Further study can be done to identify the attitude of workers and barriers to preventative practice. Observational study can be done to identify the bio-security requirements fulfillment in the farms by the poultry farmers according to poultry farming standards prescribed by Government of Nepal.

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An Epidemiological Study of Hypertension in a Rural Area of Kavre, Nepal

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Timalsina P, Bhuju C. An Epidemiological Study of Hypertension in a rural area of Kavre, Nepal. *THE CLIFF.* 2018; 1: 14-8.

ABSTRACT

Background

Hypertension is an important public health challenge and one of the risk factors for cardiovascular mortality especially in developing countries.

Objective

To determine prevalence of hypertension and risk factors in rural area of Kavre, Nepal.

Method

A cross sectional study was conducted in the rural field practice area which is catchment area of Dhulikhel Outreach Center, Dapcha from 7th May to 23rd July 2017. Total of 225 adults aged 18-64 years of age were included in the study. The structured interview method was used for collecting data and blood pressure was assessed and classified using JNC 8 criteria to grade hypertension.

Result

The prevalence of hypertension was 25.8% (95% CI: 21%-32%) and pre-hypertension was 26.7% (95% CI: 21%-32%). Among hypertensive patients, 72.4% (95% CI: 59.8%-82.2%) were unknown cases, 15.5% (95% CI: 8.3%-26.9%) were known case without medication and 12.1% (95% CI: 5.9%-22.8%) were known case under medication. In multivariate analysis, the prevalence of hypertension was significantly associated with smoking (AOR = 2.5 [95%CI: 1.1-5.5]; p = 0.027) and age more than 35 years of age(AOR = 4.0 [95%CI: 1.6 – 10.3]; p = 0.004).

Conclusion

These findings depict significant burden of hypertension in rural areas. Majority of the cases did not know about their hypertensive status. Hence health care providers should initiate screening and appropriate preventive measures regarding hypertension.

KEY WORDS

Hypertension, Pre-hypertension, Rural population

INTRODUCTION

Hypertension, a silent, invisible killer is fourth contributor of premature death in developing countries though it rarely causes symptoms in mild to moderate stages.[1] Hypertension attributes to the highest risk of deaths from cardiovascular diseases, and the risk of cardiovascular disease related to blood pressure is accelerating.[2]

As per the World Health Statistics 2015, 45% of death due to non-communicable diseases are caused by cardiovascular diseases.[3] Hypertension alone leads to 13% of global deaths.[4] In South-East Asia region, approximately 35% of adult population has hypertension.[5] According to world health ranking of top 20 causes of death in Nepal, coronary heart disease is second leading cause, stroke third and hypertension itself is 11th leading cause of death in Nepal.[6] Also, the recent data published in 2015 portraits that hypertension deaths in Nepal have reached 2.26% of total deaths annually.[7]

The first scientific hypertension survey in Nepal was done in 1981 by Mrigendra Samjhana Medical Trust which showed the prevalence of hypertension was 6% and its repeat study after 25 years of first survey showed that prevalence of high blood pressure has been increased by three folds.[8] A recent STEPS survey study of Nepal of 2013 revealed that the prevalence of hypertension in Nepal was 25.7% and another NDHS (National Demographic Health Surveillance) survey estimated hypertension among 17% of women and 23% of males aged 15 and older.[9,10]

Majority (81.39%) of Nepali population live in rural areas and study regarding prevalence of hypertension among this population and contributing risk factors will be an attempt towards updating information regarding hypertension in rural community of Nepal.[11]

The objective of the study was to assess the prevalence of hypertension and identify the risk factors of hypertension.

METHODS

The study was quantitative community based cross sectional study design. Adult population aged 18 to 64 years of age currently residing for at least six months at Namobuddha-7, Dapcha, Kavre District were chosen for study. This place was primarily chosen because it belonged to rural field practice area, which is catchment area of Dhulikhel Outreach Center, Dapcha.

Sample size was determined to be 200 by applying the formula, $n=(Z^2\alpha PQ)/d^2$, i.e. $n=((1.96)^2\times0.325\times0.675)/(0.065)^2$, where p was taken as 32.5% from a previous study, d = permissible error, taken as 20% error of 'p' from a previous study and 10% non-response rate was added to it.[12]

Systematic random sampling was used for selection of house, in which out of total 878 houses, every 4th house was selected and if the house was found to have more than one eligible case only one member was selected using Kish selection grid for simple random selection of member. By doing so we reached 225 houses.

The study was conducted using a self-designed structured questionnaire regarding socio-demographic data and possible factors affecting hypertension like tobacco intake, alcohol consumption, family history and dietary pattern. The questions were pretested before the interview and necessary changes were made. Interview and physical measurement was done for collecting data. Anthropometric measurement was taken using non-stretchable measuring tape and weighing machine. Blood pressure was taken using manual sphygmomanometer and stethoscope. The subject was placed in seating position and two readings were recorded. One was recorded after five minutes rest and another after filling questionnaire after around ten minutes of first one and the average of two readings was taken as final reading.

Data was analyzed using SPSS version 20.0 and simple descriptive statistical method (frequency, percentage) was used to describe background characteristics, prevalence of hypertension and risk factors and inferential statistics method (logistic regression) was used to assess the relation between dependent and independent variables.

Ethical clearance was taken from IRC of KUSMS and informed consent was taken from participants for data collection.

RESULTS

Among 225 subjects, more than one-fifth of population belonged to age group 50 to 64 years (27.1%) and least percentage of population was from age group 24 to 30 years of age (15.1%). Mean age of the subjects was 38.7 years ±12.5 years. Most of the respondents surveyed were literate (63.6%). Around three fourth of population was involved in agriculture (76.4%). Similarly, less than half (42.1%) were of normal weight. Majority (93.8%) were non-vegetarian. Likewise, less than one-third (28%) people smoked tobacco while around one-fourth (25.8%) of the population drink alcohol. Similarly more than one-third (39.1%) population had health risk according to waist hip ratio. (Table 1)

Among 225 subjects, nearly one-fourth of the population (25.8%) and other one-fourth of population (26.7%) were pre-hypertensive according to JNC criteria. (table 2)

Table 3 depicts the distribution of hypertension according to age and gender. This shows that majority cases of hypertension were present in age group more than 35 years than less than 35 years which was significantly significant ($p<0.001$). Also distribution of hypertension according to gender showed that male had more hypertension than female. However the difference was not significant.

Table 1. Socio-demographic information of the respondents (n=225)

Socio-Demographic Information	Frequency	Percentage
Age Group (Years)		
18-24	36	16.0
24-30	34	15.1
30-40	38	16.9
40-50	56	24.9
50-64	61	27.1
Gender		
Male	86	38.2
Female	139	61.8
Education		
Illiterate	82	36.4
Literate	143	63.6
Can read and write only	52	23.1
Primary	21	9.3
Secondary	53	23.6
Higher	17	7.6
Occupation		
Unemployed	13	5.8
Service	9	4.0
Labor	15	6.7
Self-Employed	16	7.1
Agriculture	172	76.4
BMI Status according to Asian Classification[13]		
Normal Weight	95	42.1
Underweight	11	5.1
Overweight	50	22.1
Pre-Obese	55	24.5
Obesity	14	6.0
Type of Diet Consumed		
Vegetarian	14	6.2
Non-vegetarian	211	93.8
History of Hypertension in Family		
No	195	86.7
Yes	30	13.3
Smoking		
No	162	72.0
Yes	63	28.0
Alcoholism		
No	167	74.2
Yes	58	25.8
Waist-Hip Ratio		
No risk	137	60.9
Risk	88	39.1

Table 2. Prevalence of hypertension among the respondents (n=225)

Categories of Blood Pressure	Frequency	Percentage
Low Blood Pressure	22	9.8(6.5–14.3)
Normal	85	37.8(31.7–44.3)
Pre-hypertension	60	26.7(21–32)
Hypertension	58	25.8(21–32)

Table 3. Distribution of hypertension by age and gender (n=225)

Age	Non-Hypertensive Frequency (Percentage)	Hypertensive Frequency (Percentage)	p-value
Less than 35 years	66 (94.30%)	4 (5.70%)	<0.001
More than 35 years	101 (34.84%)	54 (65.16%)	
Gender			
Male	61 (70.93%)	25 (29.07%)	0.789
Female	106 (76.26%)	33 (23.74%)	

Table 4. Current status of hypertensive cases (n=58)

Current Status of Hypertensive Cases	Frequency	Percentage (95% CI)
Not Known Case	42	72.4(59.8–82.2)
Known Case Without Medication	9	15.5(8.3 – 26.9)
Known Case Under Medication	7	12.1(5.9 – 22.8)

Table 4 shows that among hypertensive persons, about three-fourth (72.4%) did not know that they had hypertension. Nearly equal proportions of known cases were either under medication or without medication (12.1% and 15.5% respectively).

Both bivariate and multivariate logistic regression analysis were used to find the association of hypertension with various socio-demographic variables. All the variables with p-value less than or equal to 0.05 were considered significant. The variables with p-value less than 0.2 in bivariate analysis were further considered for multivariate analysis. Hypertension was significantly associated with age more than 35 years of age. There was four times more risk of having hypertension among person aged more than 35 years of age as compared to person less than 35 years of age. (AOR = 4.0 [95%CI: 1.6 – 10.3]; p = 0.004). There is 2.5 times more risk of having hypertension among those who smoke as compared to those who do not smoke (AOR = 2.5 [95%CI: 1.1 – 5.5]; p = 0.027). (Table 5 and 6).

DISCUSSION

Nepal is developing country which is going through a rapid demographic and epidemiological transition.[11] One of them is tripling of hypertension case in Nepalese community after 25 years.[8] This is because weak health system in the country leads to the number of people with hypertension that is undiagnosed, untreated and uncontrolled. This

Table 5. Bivariate analysis for risk factors of hypertension (n=225)

Variable	Subgroups	Odds Ratio (95% Confidence Interval)	p-value
Demographic Variables			
Age	Less than 35 years	Reference	
	More than 35 years	5.3 (2.1-13.2)	<0.001
Gender	Male	Reference	
	Female	0.8 (0.4-1.5)	0.469
Occupation	Unemployed	Reference	
	Service/Self-Employed	1.1 (0.1-12.1)	0.943
	Labor	3.1 (0.3-31.3)	0.342
	Agriculture	2.1 (0.2-17.3)	0.493
Education	Illiterate	Reference	
	Literate	0.8 (0.4-1.6)	0.510
Health-related Variables			
Family History of Hypertension	No	Reference	
	Yes	1.4 (0.5-3.6)	0.499
Type of Diet	Vegetarian	Reference	
	Non-vegetarian	0.8 (0.2-3.1)	0.752
Smoking	No	Reference	
	Yes	3.3 (1.6-6.5)	0.001
Alcoholism	No	Reference	
	Yes	1.9 (0.9-3.9)	0.081
BMI Status	Normal Weight	Reference	
	Underweight	0.4 (0.1-2.4)	0.417
	Overweight	1.0 (0.5-2.0)	0.753
Waist-hip Ratio	No Risk	Reference	
	Risk	1.6(0.8-3.2)	0.157

epidemiological study was thus conducted to determine prevalence of hypertension, its distribution and determinants among rural population of Kavre.

In present study, we found that prevalence of hypertension was 25.8% and prehypertension was 26.7% which is high in comparison with national STEPS survey and NDHS survey.[9,10]

The prevalence of hypertension in low and middle income countries ranges from 32.3% to 77.9%.[1] The prevalence of hypertension in Pakistan was 35.1%.[14] The prevalence of hypertension in rural community of India ranged from 8.6% to 36.5%.[3,9,10,15,16] This wide variation in prevalence might be due to social and cultural differences, dietary and lifestyle factors and also the age span used for the study.

In our study distribution of hypertension among age, gender, occupation, education and type of diet was analyzed. This finding correlates with findings from pooled analysis of 1479 population based measurement where hypertension is more among males.[3] Also the finding is consistent with

Table 6. Multivariate analysis for risk factors of hypertension (n=225)

Variable	Subgroups	Adjusted Odds Ratio (95% Confidence Interval)	p-value
Demographic Variables			
Age	Less than 35 years	Reference	
	More than 35 years	4.0(1.6 – 10.3)	0.004
Health Variables			
Smoking	No	Reference	
	Yes	2.5(1.1 – 5.5)	0.027
Alcoholism	No	Reference	
	Yes	1.0(0.4 – 2.3)	0.943
Waist-hip Ratio	No Risk	Reference	
	Risk	1.4(0.7 – 2.8)	0.390

epidemiological study of hypertension in Surkhet among 1159 population where hypertension was more common in both old age and male gender.[7] Study regarding prevalence of hypertension among 527 adults living in central region of Nepal also showed hypertension is more in male.[17] Another epidemiological study in 750 rural household community of India showed that hypertension was more prevalent in non-vegetarians. However, there is more hypertension among females. But this was not significant association.[15] These findings show that the distribution of hypertension in our study is highly consistent with the findings from other studies.

In our study, we identified the association between hypertension and various demographic and a health variable through logistic regression. It was found that hypertension was significantly associated with smoking and age more than 35 years of age.

Study of hypertension among 35125 people in low and middle income countries depicts association with increasing age, being female and being overweight or obese.[2] Survey of hypertension in 1005 subjects in rural Delhi reveals association with alcohol, age and education.[18] Another epidemiological study in Andhra Pradesh in 1025 subjects concludes association with age, tobacco and alcohol use, obesity and waist- hip ratio.[16] Similarly cross sectional study of hypertension in 587 participants in municipalities of Kathmandu, Nepal also has significant association with smoking, alcohol and body mass index.[12] Another study regarding hypertension in 527 adults of Central Development Region of Nepal reveals association with gender, age, literacy, physical inactivity, body mass index, smoking and alcohol consumption.[17] This variation in findings of association between hypertension and selected variables in our study might be due to the fact that people might have started healthy behaviors after they developed the hypertensive condition.

The limitation of the study could be that although blood

pressure was measured twice, the impact of recently taken diet or smoking and other confounding variables was not taken into consideration.

CONCLUSION

On the basis of findings and discussion, the conclusion has been drawn that prevalence of hypertension was high in rural Kavre. Moreover association of hypertension was found among persons with age group more than 35 years of age and with smoking.

Since one-third of hypertensive respondents did not know about their hypertension status, effective measures such as community based screening programs, health literacy for the prevention of risk factors could be taken for timely preventive and curative approaches.

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A Hospital-based Study on Spirometry and Associated Factors among Adult Patients of Respiratory Diseases in Dhulikhel Hospital

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Citation

Shakya P, Shrestha S. A Hospital-based Study on Spirometry and Associated Factors among Adult Patients of Respiratory Diseases in Dhulikhel Hospital. *THE CLIFF.* 2018; 1: 19-23.

ABSTRACT

Background

Spirometry which determines lung impairment like obstruction, restriction, was started in Dhulikhel Hospital in 2012 and hence this study generated information about findings of spirometry.

Objective

To determine the status of lung function via spirometry and their associated factors among adult patients.

Method

It was a hospital-based study done among adult patients aged ≥ 20 years visiting spirometry department of Dhulikhel Hospital in 1st January 2013 to 31st December 2013. Data were collected from record of spirometer and spirometry record book. Statistical Package for Social Sciences version 22 was used for analysis. Frequency and percentage were used for descriptive analysis and chi-square test was applied to identify the associated factors of lungs function.

Result

The total sample size was 330. The mean age was 46.50 years. Out of 217 abnormal lung functions; obstructive, restrictive, mixed and small airway limitations were found to be 39.9%, 23%, 34.1% and 3.2% respectively. Among 86 obstructive cases, 40.69% had significant bronchodilation reversibility test (Bronchial Asthma). There were significant association of abnormal lung function with age, smoking and indoor biomass fueling (p value <0.001, <0.001 and 0.001 respectively).

Conclusion

Abnormal lung function which was high in the study was significantly associated with age, smoking and indoor biomass fueling. Spirometry was helpful to prevent the inappropriate treatment of the cases with normal lung findings.

KEY WORDS

Lung function, Obstruction, Restriction, Reversibility test, Spirometry

INTRODUCTION

Spirometry measures how much and how fast a person can forcibly exhale air.[1] Spirometry detects lung impairment such as obstruction, restriction or a combination of both.[2] It is the most reproducible and objective measurement of airflow limitation as per the guideline of Global Initiative for Chronic Obstructive Lung Disease (GOLD).[3]

Forced mid expiratory flow (FEF25-75 percent) detects small airway limitation (bronchioles < 2 mm in diameter).[4] Ratio of Forced Expiratory Volume in 1 second to Forced Vital Capacity (FEV_1/FVC) detects airflow limitation.[5] The restrictive lung impairment is detected if FEV_1/FVC is normal or increased and FVC is decreased.[6] Hence, spirometry can detect both early dysfunction of lung as well as severity of established pulmonary disease.

Spirometry should be used widely to have accurate diagnosis of lung impairment. However, spirometry is not yet easily available in health care centers of Nepal as per the researchers' knowledge. There are few studies done for spirometry findings in Nepal.[7-9] Since, Dhulikhel Hospital started diagnostic spirometry in 2012, this study was important to identify the status of lung impairment detected by spirometry and its associated factors.

METHODS

It was a hospital-based study among the adult patients age ≥ 20 years presenting for spirometry procedure in Dhulikhel Hospital. The data were collected from record of spirometer and spirometry registry book. All the cases between 1st Janaury 2013 to 31st December 2013 fulfilling the eligibility criteria were taken as the study samples. Patients aged below 20 years were excluded from the study because most of the patients under 20 years came to evaluate bronchial asthma or to have pre-operation check up for restrictive lung disease like kyphoscoliosis. Patients below 20 years were acting as outliers for both independent variables [Body Mass Index (BMI), smoking and indoor biomass fueling] and dependent variables (Chronic Obstructive Pulmonary Disease is not a disease of less than 20 years). Other excluded cases were those with incomplete data in the spirometer record and spirometry registry book.

Spirometry was performed in the spirometer "MIR SPIRO LAB III" machine (Italy) by the researcher and co-workers. The data of four parameters of spirometry (FVC, FEV_1, FEV_1/FVC and FEF 25%-75%) were taken from the spirometer record based on the hospital registration number, while other data were taken from spirometry registry which included age, anthropometric measurements [height (cm), weight (kg)], ethnicity, smoking history and indoor biomass fueling history.

The outcome variables were normal (with all values of FEV_1, FVC, FEV_1/FVC and FEF 25-75% being normal) and abnormal lung function. Abnormal lung function was further categorized into four categories. They were obstructive lung disease (FEV_1/FVC <70% or 0.7), restrictive lung disease (FEV_1/FVC > 70% or 0.7 and FVC < 80%), mixed of obstruction and restriction (FEV_1/FVC < 70% or 0.7 and FVC < 80%) and small airway limitation (FEF 25%-75% < 50%). Obstruction was further categorized into four different types such as mild, moderate, severe and very severe obstruction with the value of FEV_1 ≥ 80%, 50-<80%, 30-<50% and ≤ 30% respectively.[3] Furthermore, based on significant bronchodilation for obstructive cases, they were categorized into obstruction due to COPD and obstruction due to bronchial asthma. The repeat test after 15 minutes of inhalation of 400 mcg of salbutamol was considered as post test. If post FEV_1 was increased by 200 ml or 12% from pre FEV_1, significant bronchodilation was considered identifying the cases with bronchial asthma.[3] Restriction and small airway limitation were identified if post FVC was < 80% and FEF 25-75% was <50% respectively.

All the collected data were coded and analyzed in SPSS version 22. Incomplete data were excluded. Mean and standard deviation were used for descriptive analysis of continuous data with normal distribution, while frequency and percentage were used for descriptive analysis of categorical variables.

The independent variables were age, gender, BMI, ethnicity, smoking and indoor biomass fueling. Age was catergorized with cut-off value of 40 years because COPD is more prevalent among those with age 40 years or more. BMI was categorized into underweight (BMI<18 kg/m^2), normal (BMI≥18 to <25 kg/m^2), overweight (BMI≥25 to <30 kg/m^2), and obese (BMI≥30 kg/m^2).[10] Smoking was categorized into non-smoker (abstinence of taking cigerettes till the date of spirometry procedure), current smoker (who had been smoking till the date of spirometry procedure or had not left smoking for at least 6 months of spirometry procedure) and former smoker (who had quitted smoking for at least last 6 months prior of spirometry procedure).[11]

Chi-square test at significance level at 0.05 was used to find out the association between abnormal lung function from the spirometry and independent variables.

Ethical permission was taken from Institutional Review Committee, Kathmandu University School of Medical Sciences. Only verbal consents were taken from all the patients for spirometry procedure.

RESULTS

Table 1. Out of 330 cases, females and respondents with age above 40 years were higher. More than half of the study respondents had normal BMI. Most of the respondents were from Kavrepalanchok. Non-smokers were higher than smokers. More than half of study respondents were exposed to indoor biomass fueling.

Table 1. Socio-demographic characteristics (n=330)

Variables	Frequency (%)
Gender	
Female	183(55.5)
Male	147(44.2)
Age	
20 to 40	129(39.1)
more than 40	201(60.9)
BMI	
Underweight	69(20.9)
Normal	184(55.8)
Overweight	66(20.0)
Obesity	11(3.3)
Districts	
Kavrepalanchowk	211(63.9)
Sindhupalanchowk	29(8.8)
Bhaktapur	52(15.8)
Kathmandu	16(4.8)
Others	22(6.7)
Smoking status	
Non smokers	171(51.8)
Current smokers	62(18.8)
Former smokers	97(29.4)
Indoor biomass fueling	
No indoor fueling	154(46.7)
Indoor fueling	176(53.3)

The study revealed higher number of abnormal lung function (Figure 1). Out of total abnormal lung funtion (n=217), most had obstructive lung disease followed by mixed, restrictive lung disease and small airway limitations (Figure 2).

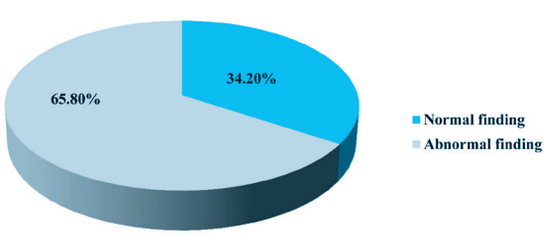

Figure 1. Status of lung function by spirometry (n=30)

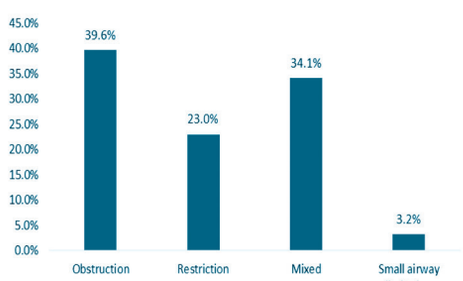

Figure 2. Types of abnormal lung function by spirometry (n=217)

Table 2. Status of lung obstruction (330)

Variable	Categories	Frequency (%)
Obstruction (n=86)	Mild	13(15.11)
	Moderate	58(67.4)
	Severe	14(16.27)
	Very severe	1(1.16)
Bronchodilation	Significant bronchodilation	35(40.69)
	No signicant bronchodilation	51(59.31)

Table 3. Association between spirometry findings and selected variables

Gender	Normal finding f(%)	Abnormal finding f (%)	p value	Odds ratio	CI
Female	69(37.7)	114(62.3)			
Male	44(29.9)	103(70.1)	0.139	1.4	0.89-2.25
Age					
20 to 40	63(48.8)	66(51.2)			
more than 40	50(24.9)	151(75.1)	<0.001	2.8	1.801-4.615
Smoking					
Non smoker	87(50.8)	84(49.2)	<0.001	5.298	3.162-8.878
Smoker	26(16.4)	133(83.6)			
Indoor biomass fueling					
No indoor biomass fueling	67(43.5)	87(56.5)	<0.001	2.176	1.370-3.459
Indoor bio-mass fueling	46(26.1)	130(73.9)			

Out of total obstructive cases, more than half of the study population had moderate obstruction followed by severe obstruction and mild obstruction. Similarly, out of total obstructive cases, more than half did not have significant bronchodilation reversibility test indicating presence of COPD while remaining were the cases of Bronchial Asthma with significant bronchodilation.

Abnormal lung function detected from spirometry finding was significantly associated with growing age (p-value <0.05), smoking (p-value <0.05) and indoor fueling (p-value <0.05). Respondents with age above 40 years, smokers and indoor biomass fueling had 2.8 times, 5.3 times and 2.1 times higher chance of developing abnormal lung function than respondents with age equal to 40 or below, non-smokers and non-indoor biomass fueling respectively (Table 3).

DISCUSSION

The study showed that among 330 respondents, 65.7% had abnormal lungs function detected by spirometry which included obstructive lung disease (39.6%) including both COPD and Bronchial Asthma, restrictive lung disease (23%), mixed of obstruction and restriction (34.1%) and small airway limitation (3.23%). Abnormal lung function

was associated with age, smoking and indoor biomass fueling. We found that higher number of respondents had abnormal lung function among those came for spirometry. This clarifies that out of total suspected cases for respiratory diseases based on the clinical evaluation, most of them had confirmatory diagnosis of lung impairment while still some portion found to have normal lung findings.[12] Thus, those patients with normal spirometry finding can be prevented from inappropriate treatment.

Majority of respondents had obstruction followed by mixed findings of obstruction and restriction in this study. Moreover, patients with no significant bronchodilation (COPD) findings were higher among obstructive cases. There could be three reasons for this high number of COPD cases. First, it was common to have COPD patients in the OPD in Dhulikhel Hospital.[13] The patients were then referred to spirometry department to have either confirmation of diagnosis of COPD or to identify severity of COPD.[14] Second, the number of respondents with significant bronchodilation (Bronchial Asthma) was fewer among adults as it was more prevalent among children, who were excluded in this study.[15] Third, the effort for hard and fast blow might have been inadequate among the respondents resulting in decreased values in spirometric parameters and thus showing no significant bronchodilation.[16] However, the reversibility rate (40.69%) in the current study indicating Bronchial Asthma was higher compared to the study done in Syria (11%).[17] And lower than in Sydney (57.8%).[14]

We obtained higher number of respondents with moderate obstruction than respondents with severe obstruction. One of the possible reasons could be less prescription for spirometry procedure among those clinically severe patients as spirometry is a difficult procedure to perform. Similarly, those severely obstructed cases might not have fulfilled the criteria for spirometry procedure making them excluded from the study.[14]

Furthermore, the trend of distribution of COPD (15.11% mild, 67.4% moderate, 16.27% severe, and 1.16% very severe obstruction) was comparable with one of the studies done in New Mexico (19% mild, 50% moderate, 26% severe, and 5% very severe disease) according to the GOLD criteria.[18] The reason behind obtaining lower number of mild cases could be the unawareness to go for medical checkup as early as possible after developing the symptoms making the early stages of COPD undiagnosed.[14,19]

In terms of associated factors of abnormal lung function, though it did not show significant association with gender, it seemed women had tendency to develop abnormal lung function than men in the current study which could be one of the impacts of exposure to indoor biomass fueling among Nepali women while cooking food than men.[20] In addition to indoor biomass fueling, smoking is also prevalent among Nepali women increasing the possibility of COPD.[21] Aging decreases lung function, which was evident by having 2.8 times higher odds of having abnormal lung function among respondents of age 40 years or more than those of age below 40 years which was supported by the study done in Norway.[22,23] Abnormal lung function was found to be more prevalent among smokers than non-smokers in the current study which was in support of many studies done in relation of lung function with smoking status.[18,24] It was 5.3 times higher chance of developing lung impairment if one continues smoking cigarette. Aditionally, in the current study there was significant association of smoking with abnormal lung function which was similar to the study done is Syria with p-value of 0.001.[17] However, this Syrian study took only women as study population which was contrast with the current study. Nevertheless, this result would be useful to provide evidence to show the association of smoking with harmful effects in the lungs leading to COPD.

On the other side of smoking, there is a huge problem of indoor biomass fueling in Nepal as discussed in the earlier paragraph.[20] About 74% of those being exposed to indoor biomass fueling, had developed abnormal lung function which was statistically significant to increase the chance of developing abnormal lung function by 2.1 times. This evidence was support by a case-control study done in Turkey.[25]

The obtained prevalence of restrictive cases (15.15%) was nearly similar to the prevalence of restrictive cases (19.4%) in the study done in Norway.[23] The number of patients coming with the symptoms of restrictive lung function was likely to be lower and most of them came for pre-operational lung evaluation by spirometry procedure as per researcher's experience.

The current study showed minimal cases with small airway limitation with FEF25-75% with less than 50% despite of all other findings under normal limit. So, it can be inferred that FEF25–75% does not add substantial information with respect to the diagnosis of airflow obstruction in reference to the conclusion drawn from the report published.[26]

There were some strengths of this current study such as it included the data of one whole year which could give the picture of status of spirometry findings within a year in Dhulikhel Hospital. We can infer the obtained results of the study for practical implication such as if we minimize exposure to associated factors of abnormal lung function like smoking and indoor biomass fueling; there is a possibility to reduce the occurrence of abnormal lung funtion in the adult population of Nepal.

However, there are some limitations of the study, such as the study could not give causal relationship as it was a cross sectional study. Generalisation cannot be done due to limited sample size. The study did not included patients who were unable to perform spirometry, which might have biased our results.

CONCLUSION

The study revealed more than half of the study population had abnormal lung function and was significantly associated with age, smoking and biomass indoor fueling. So, the study suggests that reducing smoking and indoor biomass fueling could help to decrease abnormal findings of the lung function. Spirometry evaluation is important to exclude the normal cases and prevent them from having inappropriate treatment.

ACKNOWLEDGEMENT

We acknowledge department of nursing; department of internal medicine and Ms. Sherima Pradhan, Respiratory Unit Nurse.

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Effectiveness of Educational Intervention on Knowledge Regarding Reproductive Health among Secondary Level Students of a Private School of Kathmandu, Nepal

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Bajracharya S, Shakya S. Effectiveness of Educational Intervention on Knowledge Regarding Reproductive Health among Secondary Level Students of a Private School of Kathmandu, Nepal. *THE CLIFF.* 2018;1:24-7.

ABSTRACT

Background

Reproductive health is a crucial part of general health and a central feature of human development. Majority of the adolescents still do not have access to adequate information on sexual and reproductive health. Therefore, there is immense necessity to provide awareness in order to enable them to prevent themselves from different sexual and reproductive health problems.

Objective

To assess the effectiveness of educational intervention on knowledge regarding reproductive health among the adolescents.

Method

An educational intervention study was conducted in 2072 BS. among the adolescents of Siddhartha Vanasthali Institute. Stratified random sampling technique was used to select 100 students of Grade IX. Semi-structured self administered questionnaires were used to assess effectiveness of intervention on knowledge regarding reproductive health.

Result

Only 30% of the students had good knowledge before intervention. The mean knowledge score before the intervention was 36.02±0.672, while the mean knowledge score after intervention was 48.27±0.337, with almost all (98%) having good knowledge. The difference between pretest and posttest knowledge score was found to be highly significant ($p<0.01$).

Conclusion

The study suggests that reproductive health education can improve the knowledge of the adolescents. Thus, such programmes must be given due importance to safeguard the reproductive health of the adolescents. The study findings showed that very few percent of the adolescents had good pretest knowledge. Thus, it can be recommended that the school teachers should be counseled to take interactive sessions encouraging the students to clear their queries freely.

KEY WORDS

Adolescents, Knowledge, Reproductive health

INTRODUCTION

World Health Organization (WHO) defines adolescence as the period of life between 10 and 19 years of age.[1] Adolescents experience not only physical changes but also emotional, psychological, social and mental changes. Adolescent health needs, behaviours and expectations are unique and routine health care services are not well geared to provide these services.[2]

Adolescence is a period of dynamic transition. Puberty brings with it an intensification of sexual response and the beginning of sexual behavior which leads to sexual and reproductive health problems.[3]

Adolescents find themselves sandwiched between a glamorous western influence, which arouses their curiosities and instincts, and a stern conservatism at home, which strictly forbids discussion on sex.[4] An adolescent's sexual and reproductive health is strongly linked to their particular social, cultural, and economic environment. Access to health care and sources of education, information, and support also varies widely.[5] This has lead to increase in pre-marital sexual activity.[6] Such unsafe sexual activities conducted under ignorance can cause various fatal and non-fatal reproductive health problems.

Knowledge regarding reproductive health among adolescents is very essential to lead healthy lives and protect themselves from different reproductive health problems. The educational institutions occupy important place in creating awareness among adolescents about any such issues. Adolescents develop their reproductive health skills from school, which helps them to survive and to improve health of themselves and their families. The main aims of this study were to assess the knowledge of adolescents on the selected aspects of Reproductive Health: reproductive organs, secondary sexual characteristics, menstruation, contraception, teenage pregnancy and Sexually Transmitted Infections/Human Immunodeficiency Virus (STI/HIV) and to assess the effectiveness of intervention programme on knowledge of adolescents on different aspects of Reproductive Health.

METHODS

This was an intervention study conducted in February and March 2016 to assess the knowledge on Reproductive Health among adolescents of Siddhartha Vanasthali Institute (SVI) located in Banasthali of Kathmandu. One group pretest posttest design was used for the study. The study participants were 100 students including both male and female studying in grade IX. The students who were willing to participate in the study were included. The students who were not present during the educational session were excluded from the study.

Stratified random sampling technique was used for selection of the students. Twelve students were selected from each section from A to G, in which there were total 30 students in each section whereas 16 students were selected from the larger section H having 40 students. Lottery method was used to select the required number of the students from the name lists of each section from the register of the school.

Data collection was done by using predesigned and pretested semi-structured self administered questionnaire which was prepared based on the curriculum of grade IX. The validity of the tool was established through literature review, consultation with the experts and peer review for cross checking and verification of the tool. The questionnaire was prepared in simple and understanding manner which included socio-demographic information, exposure to mass media and knowledge on reproductive health. Pre-testing of the questionnaire was done in 10% of the sample in a different school. Modification of the tool was not done as the pretest result showed no confusion or misunderstanding.

The questionnaires were first distributed among the students for pretest after clear instruction. Classes on the related topics were conducted in two sessions for two days by the researchers themselves based on the school curriculum. The topics of the sessions were reproductive organs, secondary sexual characteristics, menstruation, contraception, teenage pregnancy and STI/HIV. The average duration of each session was around 40-45 minutes. Posttest was conducted after one month of the educational session among the same participants.

The collected data were analyzed in Statistical Package for Social Sciences version 21 by using descriptive and inferential statistics. Mean, frequency and percentage were calculated for descriptive analysis while independent t test, paired t test and ANOVA were used for inferential statistical analysis. The analyzed data were then presented in tables and figures with the use of Microsoft Word 2007 and Microsoft Excel 2007. Knowledge was scored taking the reference from Sharma and Sheoran, 2013 and classified its level into poor, average and good as <50%, 50-70% and >70% respectively.[6]

Ethical approval was obtained from the Institutional Review Committee of Nepalese Army Institute of Health Sciences, Sanobharyang, Kathmandu. Formal permission for the study was taken from the concerned authorities of the selected school. Verbal informed consent was taken from the respondents before data collection. None of the respondents were forced to participate in the study.

RESULTS

The mean age of the respondents was 14.63±0.72 years with half (50%) belonging to 15 years of age. Three fifth of the respondents were females (60%) and two thirds belonged to Brahmin/Chhetri ethnicity (66%), while 3%

Table 1. **Socio-demographic characteristics of the respondents (n=100)**

Characteristics	Percent (%)
Age (in years)	
13	5.0
14	36.0
15	50.0
16	9.0
Mean age=14.63±0.720 years	
Sex	
Male	40.0
Female	60.0
Ethnicity	
Brahmin/Chhetri	66.0
Janajati	28.0
Madhesi	3.0
Others	3.0
Education of Father	
Illiterate	1.0
Secondary	9.0
Higher Secondary	27.0
Bachelor and above	63.0
Education of Mother	
Illiterate	2.0
Secondary	28.0
Higher Secondary	34.0
Bachelor and above	36.0
Occupation of father	
Business	59.0
Service	38.0
Labour	2.0
Social worker	1.0
Occupation of mother	
Homemaker	59.0
Service	21.0
Business	18.0
Agriculture	2.0

lies in other category i.e Dalit, Muslim and Thakuri. With regards to educational status of the parents, higher percent of fathers (63%) had attained bachelor and above education than mothers (36%). Likewise, more than half of the fathers (59%) were engaged in business whereas the same percent of the mothers (59%) were engaged in housework.

Nearly one third (30%) of the respondents had good knowledge in pretest, while almost all (98%) had good knowledge after educational intervention.

Female students had significantly higher mean knowledge score than male students. Similarly, the students of section H had highest mean knowledge score (42.06) followed by section C (38.00). The differences were found to be highly significant (p<0.01).

Table 2. **Pretest knowledge score and demographic characteristics (n=100)**

Characteristics	Mean Knowledge Score	Std. Deviation	Number	p value*
Age				
13	40.40	5.68	5	0.468
14	35.86	5.12	36	
15	35.96	7.06	50	
16	34.56	10.42	9	
Sex				
Male	34.30	7.16	40	0.036**
Female	37.17	6.21	60	
Section				
A	29.75	8.01	12	
B	36.50	9.05	12	
C	38.00	4.05	12	
D	35.25	5.17	12	<0.01**
E	36.92	5.58	12	
F	34.33	5.53	12	
G	33.33	5.30	12	
H	42.06	3.28	16	

*Independent t test and ANOVA
** p value <0.05 at 95% confidence interval

Table 3. **Difference between pretest and post test knowledge Score (n=100)**

Characteristics	Mean Pretest knowledge	Mean Post test knowledge	p value*
Overall Knowledge	36.02±0.67	48.27±0.34	0.01**
Knowledge among male and female respondents			
Male	34.30±7.16	47.80±3.30	0.221
Female	37.17±6.21	48.58±3.41	0.008**

*Paired t test
**p value <0.05 at 95% confidence interval

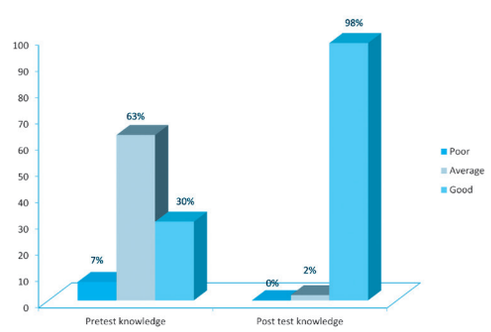

Figure 1. **Level of knowledge before and after intervention**

The mean knowledge scores before and after the intervention were 36.02±0.672 and 48.27±0.337 respectively, the difference of which was found to be significant (p<0.05). Females showed significantly higher knowledge score after intervention (p=0.008) but no significant difference was found between pretest and posttest knowledge score among males.

DISCUSSION

This study evaluated the effectiveness of health education on knowledge of the students regarding reproductive health. Half of the students were of age 15 years which is different in another study conducted in 2005 in Chandigarh, India.[4] Concerning the sex, most of them (60%) were female. Similarly, more than half of the study participants were Brahmin/Chhetri (66%) and majority belonged to Hindu religion (85%) which is similar to the findings of the intervention study done in India in 2011.[7]

Before educational intervention, only 30% of the students had good knowledge. This finding is not satisfactory as it is generally expected that after completion of the particular course in school, majority of the students should have good knowledge on the topic. After educational intervention, there was a considerable increase in the knowledge of the students. Most of them 63% had average knowledge during pretest, while almost all 98% had good knowledge during posttest. The mean knowledge score before the intervention was 36.02±0.672 which was sharply increased to 48.27±0.337 during posttest. The difference between pretest and posttest knowledge score was found to be highly significant ($p<0.01$).

It was found that knowledge among female students was significantly increased after educational intervention, however in male students, there was no significant change in knowledge. Female students had higher mean knowledge score than male students both before and after intervention. However, no significant difference was found in other categories like age, ethnicity, family type and religion.

The study did not have any sampling mortality. The design of the study was one group pretest, posttest design which lack control group so there would be threats to internal validity, maturation, testing and history effect. Therefore, it is recommended that the results should be used cautiously.

CONCLUSION

A significant increase in knowledge was found among the students after educational intervention. The mean knowledge scores before and after the intervention were 36.02±0.672 and 48.27±0.337 respectively, the difference of which was found statistically significant ($p<0.05$). More than half showed average knowledge during pretest, while almost all showed good knowledge in posttest. This shows that the educational intervention provided to the students was effective in increasing their knowledge on reproductive health. Such sessions on reproductive health can be dealt with by health professionals as they have expert knowledge on it. Free and interactive class sessions should be conducted so that adolescents can learn better and freely share their queries with the subject teachers. Parental approach can also help to flow the information about reproductive health and its issues among children. This encourages the adolescents to share and discuss about reproductive health lifelong. There is also need to strengthen health policies and programmes for adolescents regarding reproductive health like activation of mass media, group counseling, distribution of pamphlets and booklets etc. which help to promote their reproductive health among these groups.

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Utilization of Antenatal Care Services among Mothers of Under Five Children in Dhungkharka, Nepal

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Shrestha S, Prajapati R, Shrestha GK. Utilization of Antenatal Services among Mothers of Under Five Children in Dhungkharka, Nepal. *THE CLIFF.* 2018; 1: 28-32.

ABSTRACT

Background

Maternal health services during pregnancy helps to ensure healthy outcomes for mothers and newborns. Utilization of antenatal care services is the basic component of maternal care which can improve the outcome of the pregnancy.

Objective

To find outthe utilization of antenatal care (ANC) services among mothers of underfive children.

Method

A descriptive cross-sectional study was carried out among the mothers of underfive children in Dhungkharka. A pre-tested questionnaire was administered to 170 mothers between 15-45 years of age group. Household survey was done by using face-to-face interviews. Data was collected from 1st July to 30th July of 2014and analyzed using simple descriptive statistic with SPSS version 16. Association with utilization of ANC was assessed by using chi-square test.

Result

Among the total respondents, the majority (96.5%) of them attended ANC clinic, out of them 79.9% attended ≥4 ANC visits. Utilization of ANC services were associated with the mothers' educational level and number of the children and no association was found between age, occupation, smoking status and walking distance to health center.

Conclusion

Utilization of ANC services was higher in the study area compared to national data. Mothers' educational status and number of children were associated with the utilization of the ANC services.

KEY WORDS

ANC visit, Antenatal care, Utilization

INTRODUCTION

The World Health Organization (WHO) estimated that in 2015, roughly 303,000 women died during and following pregnancy and childbirth.[1] It was found that about 88 to 98% of all maternal deaths could be avoided by proper handling during pregnancy and labor.[2] Antenatal care utilization in the developing countries is low when compared to that of the developed countries which is 97%.[3] Skilled attendance during delivery is 54% in developing countries while it is 99% in the developed countries and postpartum care utilization is 30% compared to 90% in developed countries.[3,4]

The Iron Supplementation Program for pregnant women to prevent from Anemia was introduced as part of Ministry of Health and Population's (MOHP) nutrition program, covering all 75 districts of Nepal. The program involved distributing iron-folate supplements to pregnant women through health facilities and outreach clinic.

However, the maternal mortality ratio (MMR), 258 per 100,000 live births, is still high among the South Asian Countries.[5] Forty-two percent of pregnant women suffer from nutritional anemia. Twenty six percent mothers received no ANC services, 40 percent did not take iron tablets during pregnancy, and 37 percent did not complete 2 TT (Tetanus toxoid) vaccines in their last pregnancy in Nepal.[5] Addressing maternal health requires the understanding of ANC services received by mothers during the designing and delivering of ANC Services to the rural mothers.[6]

Hence, this study aims to assess utilization of antenatal service among mothers of under five children.

METHODS

Descriptive cross-sectional study was conducted in ward number 6 and 7 of Dhungkharka community. Dhungakharka is a rural area in Nepal, 25 kilometers far from the Dhulikhel and it takes 5 hours to reach due to improper roads. Sample size was not calculated in advance but all total 170 mothers of age 15-45 years, having child <5 years were included during study period by using purposive sampling technique Door-to-door survey was carried out from 1st July to 30th July in 2014 using structured questionnaire. The questionnaire comprised of two parts: the first part consisted of the socio-demographic information and second part included information related to utilization of antenatal services. Data was obtained by using face-to-face interview technique.

The Institutional Review Committee of Kathmandu University School of Medical Sciences, Dhulikhel Hospital approved the study protocol. All participants were informed about the nature and purpose of the study and informed consent was obtained before the data collection.

The quality assurance of the data was maintained through daily assessment by questionnaires filled by the researcher herself; in cases of error or incompleteness, immediate correction was done. The data were entered into the Statistical Package for Social Science Software (SPSS) version 16.0 for analysis using descriptive and inferential statistics (Chi square test).

RESULTS

The socio-demographic characteristics of respondents have been presented in Table 1. Mean age respondents was 24.9±4.7 years with range of 17-45 years. More than three fourth of respondents (77%) were from age group of 20-29. The majority (85.9%) were literate and more than two third (68.2%) were housewives. The majority of the respondents (82.4%) followed Hinduism. Very few (2.7%) were smokers. Among the total respondents, 79.4% had two children or less and 50% of them had child less than one year.

Table 1. Socio-demographic information of study respondents (n=170)

Variables	Frequency	Percentage
Age in years		
<20	10	5.9
20-29	131	77.0
≥ 30	29	17.1
Educational status		
Literate	146	85.9
Illiterate	24	14.1
Occupation		
House wife	116	68.2
Service holder	4	2.4
Self employed	50	29.4
Religion		
Hindu	140	82.4
Buddhist	30	17.6
Smoking status		
Smoker	5	2.9
Non-smoker	165	97.1
Number of children		
<Three children	135	79.4
≥Three children	35	20.6
Age of the youngest child		
<1 year	85	50.0
1-3 years	71	41.8
>3 years	14	8.2

The information about ANC visit of the respondents is presented in the table 2. Out of 170 respondents, 96.5% attended ANC clinic. Among those who attended ANC visits, more than two third (68.2%) of the respondents had to walk more than 1 hour to reach the nearest health facility. More

than three fourth (79.9%) of the respondents had 4 ANC visits or more. Almost 40% (37.8%) of the respondents had visited a Hospital for the ANC visit. The majority (82.9%) of women reported that they had to wait less than an hour for ANC checkups in the health facility.

Table 2. Information about ANC visit of the respondents

Variables	Frequency	Percentage
ANC visit (n=170)		
No	6	3.5
Yes	164	96.5
Walking distance to nearest health facility (n=170)		
≤ 1 hour	54	31.8
> 1 hour	116	68.2
Number of ANC visit (n=164)		
<4 visits	33	20.1
≥4 visits	131	79.9
Place of ANC visit (n=164)		
Hospital	62	37.8
Health post	100	61
Private Clinic	2	1.2
Waiting time for ANC checkup (n=164)		
<1 hour	136	82.9
≥1 hour	28	17.1

The utilization of ANC services of respondents is presented in the table 3. Out of 170 respondents, almost all (97.1%) received injection TT vaccine, among 165 respondents 27.9 % of them received only one injection of TT. Likewise, a majority (91.2%) of them had taken medication for deworming, while very few 2.9 % of them had not taken Iron tablets as their supplements. Among 165 respondents (92.1%) of them had taken the iron tablets from health post and a few (22.9%) had not taken calcium tablets during pregnancy. Almost all (95.1%) of them received information on nutrition during pregnancy.

The association between utilization of Antenatal service and selected demographic variables is presented in the table 4. The higher proportions of utilization of antenatal services were found in literate mothers as compared to illiterate mothers (p=.037). Similarly, utilization of ANC services was significantly more among mothers with 3 or less children than among those with more than 3 children (p=0.017). But no significant association was seen between utilization of antenatal services and age of mothers, occupation, smoking status and walking distance to health center.

DISCUSSION

This is a cross-sectional community-based survey to find out the utilization of antenatal health care services. We found that 96.5% of mothers attended ANC services at least once and among those, around 80% of them had four or more visits. Among 170 respondents, 72.1% had taken TT2, and 97.1% had taken iron tablets during the pregnancy time.

Table 3. Distribution of utilization on ANC services

Variables	Number	Percentage
Vaccination of TT (n=170)		
Not received injection	5	2.9
Received injection	165	97.1
Number of TT (n=165)		
Received one injection	46	27.9
Received two injection	119	72.1
Took deworming medication (n=170)		
No	15	8.8
Yes	155	91.2
Use of Iron tablets (n=170)		
No	5	2.9
Yes	165	97.1
Place of received Iron tablets (n=165)		
Health post	152	92.1
Buy themselves	13	7.9
Use of Calcium tablets (n=170)		
No	39	22.9
Yes	131	77.1
Health information received on nutrition during pregnancy (n=164)		
No	8	4.9
Yes	156	95.1

Table 4. Association between utilization of antenatal service and selected demographic variables (n=170)

Variables	Utilization of Antenatal care services		p value
	Number	Percentage	
Age in years			
≤ 30 years	148	97.4	0.123
>30 years	16	88.9	
Education level			
Literate	143	97.9	0.037
Illiterate	21	87.5	
Occupation			
housewife	112	96.6	1.000
Other than housewife	52	96.3	
Smoking status			
Smoker	5	100	1.000
Non-smoker	159	96.4	
Number of children			
< 3 children	133	98.5	0.017
≥ 3 children	31	88.6	
Walking distance to nearest health facility			
≤ 1 hour	52	96.3	1.00
> 1 hour	112	96.6	

The study showed that 96.5% of the respondents attended ANC clinic which is higher than a Nigerian study where 76.8% of the respondents attended ANC clinic.[7] And almost similar findings were shown in the study conducted in Addis Ababa, Ethiopia which showed 94% of the pregnant women visited the health facility for ANC check-up.[8]

In our study we saw that 68.2% of the women had to walk >1 hour to reach nearest health facility, however in an Ethiopian district women had to walk far as in our geography where 34.2% of the mother had 1-2 hour of walking distance.[9]

The present study shows that 79.9 % of the respondents visited four or more than four visits which is much higher than the national figure where 51% of the women had four ANC visit in 2015/2016, lower than the study conducted in India where 85.5% of the participants received at least three antenatal care services from any health facility.[4,10] It could be attributed to performance of Accredited social health activist and presence of sub centre in the village in India. However the study conducted by Christopher et al. in Ghana, Kenya and Malawi where stated that only 46% attend ANC four or more times.[11] It could be the distances to health facilities from their home, women face a three-hour walk.

The study revealed that 17.1% of the respondents reported that that they had to wait an hour or more than one hour which is less in comparison to the study conducted by Yang et al. where 20.3% of Japanese women had to wait ≥ 30 minutes for ANC service who had received ANC. This suggests a better scenario in terms of lesser waiting time in the context of Nepal in comparison to Kham District, Japan.[12]

The women in Dhungkharka showed that 72.1% of the them received two injections of TT which is higher than the national data where only 66% of the women received TD2 and 2+ in 2015/2016.[4]

In the present study revealed that 91.2% of the women had taken deworming medication which was much higher than the study conducted by Abosee et al. in Hadiya Zone, Southern Ethiopia. where only 7% of women had taken drug for intestinal parasite.[9]

This study revealed that 95.1% of the respondents received health information on nutrition similar study conducted by Rasheed et al. in primary health centers, Al-Khobar, where 74.5%, 71.4% and 68.2% of women were informed about dairy products, Protein-rich foods and fruits respectively.[13]

In our study we found that there is no association between utilization of ANC services and age of the mother which is in contrast to the study conducted by Kawungezi where the ANC service utilization was significantly influenced by maternal age; mothers aged 25-29 years were less likely to utilize ANC services than women who were 35 years and older.[14]

In our study we found that there is association between utilization of Antenatal services and education status of the participants. Similar study conducted by Adhikari et al. found that utilization of complete ANC was positively associated with education status of women.[15] The reason could be that educated mothers were more likely to be aware of the need for ANC and registering with the health facilities.[15]

This study shows there is significant association between utilization of antenatal care services and number of children which is in contrast to the study conducted by Deo et al. where association was not found between ANC services and parity.[16] This might due to women with more than three children didn't not have time to visit to the health center because of household work.

The strengths of this study are: it is door-to-door survey and data collected using face-to-face interview. The main limitation of this study is: data were collected based on the recalls of mothers so that some degree of the over reporting and under reporting of utilization of antenatal health services may be expected. Finding could not be generalized because of non-probability sampling technique. Similar study can be done in a larger sample size.

CONCLUSION

The admission CTG test is simple, noninvasive and useful test to detect fetal distress which is already present at the time of test and can predict fetal well being during the next few hours of labour. This test might lead to higher incidence of operative delivery at low resource country because of lack of fetal blood sampling test to confirm fetal hypoxia. With this conclusion we recommend that, repeat CTG test to be done after 5-6 hours of reactive admission test.

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A Study on Nutritional Status of Under Five Children of Melamchi Municipality

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Prajapati R, Shrestha S, Bhandari N. A Study on Nutritional Status of Under Five Children of Melamchi Municipality . *THE CLIFF.* 2018; 1: 33-7.

ABSTRACT

Background

Nutritional status of children is a major indicator of child health and also an important predictor of the entire population health status. Malnutrition among children remains a major public health problem in Nepal.

Objective

The objective of this study was to assess the nutrition status of under five children and associated factors of malnutrition.

Method

A community based analytical cross-sectional research design was conducted in Melamchi Municipality of Sindhupalchok District. Purposive sampling technique was used for data collection from 130 numbers under-five children. Semi structured questionnaire was developed and interview technique was used for data collection and anthropometric measurements (height, weight) were taken from the children to identify the level of nutritional status. For data analysis, Statistical Package for Social Sciences version 20 was used for descriptive statistics (frequency, percentage) and inferential statistics (chi square test).

Result

Among the 130 under five children, underweight was seen among 25.4% children, stunting among 54.6% and wasting among 23.1% children. It was found that mother's age and educational status had statistically significant association with malnutrition of children.

Conclusion

In the study, there was more prevalence of malnutrition (underweight, stunting, wasting) on the study population as compared to existing national data. It is recommended that special focus should be considered for delayed child birth and education of mothers for better nutrition of children.

KEY WORDS

Anthropometry, Nutritional status, Under five children

INTRODUCTION

The nutritional status of children is important factor for health, growth and development for their future life.[1] World Health Organization (WHO) estimated globally of around 6.6 million under five children death in the year 2012.[2] Malnutrition is responsible for over 50% of 10-11 million under-five deaths from preventable diseases.[3] Also, nutritional well-being is crucial for attaining many of the Sustainable development goals.[4]

In 2011, globally 165 million under five children were stunted, 101 million children were underweight and 52 million children were wasted.[4] Protein energy malnutrition (PEM), stunting and wasting are common health problem of the developing countries. Nutritional assessment involves anthropometric measurement, biochemical tests, clinical observation, functional assessment, dietary survey, ecological study and study of vital statistics.[5]

The rate of child under-nutrition in Nepal remains a major health problem despite a steady decline in recent years. Nepal Demography Health Survey (NDHS) in 2016 reports 36% stunting, 10% wasting and 27% underweight among under five children.[5] Rural and mountain children are more likely to be underweight than urban, terai and hilly children.[5,6]

The common causes of malnutrition are lack of access to the availability of food, poor feeding practices, inappropriate complementary food practice, infections, low birth weight, lack of mother's education and low knowledge of micronutrient management. Early marriage age and lack of maternal autonomy are also the factors affecting nutritional status of children.[1,4] The objective of the study was to assess the level of nutritional status of under five children in different aspects and associated factors.

METHODS

A descriptive cross sectional research study was conducted in Melamchi Municipality of Sindhupalchok district from 16th to 30th April 2017. Ethical approval was taken from Institutional Review Committee (IRC) of Kathmandu University School of Medical Sciences. For data collection, mothers who had children of age 6 to 60 months were selected purposively for the study. Children with congenital abnormality and severely sick during data collection period were excluded. According to NDHS (2011) the prevalence of stunting in central development region is 45.5%. Based on this prevalence at 5% level of significance and 20% allowable error and adding 10% non response rate, the final sample size was taken as 130 under-five children.

A semi-structured questionnaire was developed by researcher herself after extensive literature review, consulting subject experts and colleagues. The questionnaire was translated into Nepali language for ease of data collection from mothers. Pretesting was done on 10% of the mothers who were not included in the main study. Before the data collection, the purpose of the study was informed and informed consent was taken from mothers of under five children. Data was collected by face-to-face interview with the mothers. Anthropometric measurements: length/height and weight were taken from under five children. For measuring height, children were made to stand bare foot on a floor against the wall and with feet parallel and joined together and with heels and buttock touching the wall. The height was marked on the wall and then it was measured with a tape. Length of child within the 24 months was taken in supine position. For measuring the weight, weight (Salter's) scale was used. For measuring the nutritional status; weight-for-age, length/height-for-age, and weight-for-length/height were calculated -for- same age as WHO reference population and calculated in percentage to categorize them into different levels of underweight, stunting and wasting.[7,8]

Data was coded and entered in SPSS 20 version. Descriptive statistical method like percentage and frequency were used. For inferential statistics, Chi square test was applied to assess association between prevalence of malnutrition (underweight, stunting, wasting) and selected socio-demographic variables.

RESULTS

The age of the mothers ranged from 15 to more than 35 years. More than half of the mothers (51.5%) were from the age group 20 to 25 years. Most of the families were single in type (71.3%). Almost one-fifth of the mothers (23.8%) were illiterate. Disadvantage Janajat were maximum (46.9%) residing ethnicity. The dominant religion was Hindu (88.5%) and nearly half of the mothers were housewives (46.9%).

Regarding information of obstetrical history of mothers, most of mothers (96.9%) had visited antenatal clinic (ANC) during pregnancy. Among the mothers who visited ANC, most of them (88.9%) had visited ANC four or more times. Majority of mothers had taken complete dose of Tetanus Toxoid (TT) vaccine (98.4%) and Albendazole (95.2%). Similarly among the 130 children, 69 were male and 61 female. Among them 46.2% were the first children. More than half of the mothers (56.2%) had done exclusive breast feeding.

The nutritional status of under five children according to weight for age, most of the children i.e 74.6% children had normal weight, Grade I underweight or Protein energy malnutrition (PEM) was 17.7% while Grade II underweight or PEM was only 7.7%.

Regarding the nutritional status of children according to length or height for age, 45.4% of the children were in normal nutritional status, 39.2% had mild stunting, 10.8% had moderate stunting and 4.6% were severely stunting.

Table 1. Socio-demographic information of mothers (n=130)

Socio-demographic Information of mothers	Frequency	Percentage
Age of mother		
15-20 years	8	6.2
20-25 years	67	51.5
25-30 years	33	25.4
30-35 years	19	14.6
≥35 years	3	2.3
Type of family		
Single	93	71.5
Joint	34	26.2
Extended	3	2.3
Educational level		
Illiterate	31	23.8
Literate	25	19.2
Primary	20	15.4
Secondary	24	18.5
Higher secondary	22	16.9
Above Higher Secondary	8	6.2
Ethnicity		
Disadvantage Janajati	61	46.9
Brahmin/Chhetri	37	28.5
Relatively advantaged Janajati	20	15.4
Dalit	6	4.6
Others	6	4.6
Religion		
Hindu	115	88.5
Buddhist	14	10.7
Muslim	1	0.8
Occupation		
Housewife	61	46.9
Agriculture	35	26.9
Business	28	21.6
Service	6	4.6

Regarding the nutritional status of children according to weight for length or height that is wasting, 76.9% were in normal nutritional status, 16.9% mild wasting and only 1.5% severe wasting.

Chi-square test was used to determine the association between the selected variables and nutritional status according to weight for height. The malnutrition was higher (52.4%) in the children whose mother's age ≤20 years whereas lower (20.2%) in the children whose mother's age >20 years. Similarly the malnutrition was higher (41.9%) in children whose mothers are illiterate whereas lower (20.2%) in children whose mothers are literate. It was found that mother's age and educational status had statistically significant association with malnutrition (underweight) of children (p-value 0.002 and 0.015 respectively).

Table 2. Information regarding obstetrical history of mothers and Children (n=130)

Obstetrical information of mothers	Frequency	Percentage
ANC visit		
Yes	126	96.9
No	4	3.1
Number of ANC checked up(n=126)		
< 4 times	14	11.1
≥4 times	112	88.9
Tetanus Toxoid injection (n=126)		
Not taken	2	1.6
Taken	124	98.4
Albendazole (n=126)		
Yes	120	95.2
No	6	4.8
Gender of the Children		
Male	69	53.1
Female	61	46.9
Birth order		
First	**60**	**46.2**
Second and more	70	54.8
Breast feeding		
Less than 6 month	57	43.8
Up to 6 month and more	73	56.2

Table 3. Nutrition status of children (*Weight for age) (n=130)

Nutritional status	Frequency	Percentage
Normal (≥80%)	97	74.6
Grade I underweight or PEM (71-80%)	23	17.7
Grade II underweight or PEM (61-70%)	10	7.7

*(Weight for age classification was done according to Indian Academic of Pediatric (IAP) and National Center for Health Statistics (NCHS) standards.
Percent of Weight for age=[weight of a child / weight of a normal child of the same age]×100).[7,8]

Nutritional status of children was seen to be significantly associated with ethnicity (p-value 0.042). It was found that stunting was more common among Janajati (60.2%) than among Brahmin/Chhetri (40.5%).

It was not found any association of mother's age, ethnicity, religion, educational status, and place of birth, exclusive breast feeding, sex of children and birth order with nutritional status of children according to weight for height that is wasting.

Table 4. Nutritional status of the children (*heights for age) (n=130)

Nutritional status	Frequency	Percentage
Normal (≥95%)	59	45.4
Mild stunting or impaired (87.5-95%)	51	39.2
Moderate stunting or impaired (80-87.5%)	14	10.8
Severely stunting or impaired (<80%)	6	4.6

(*Height for age according to Waterlow's classification and NCHS standards.
Percent of height for age= [Length or height of a child/height of a normal child of the same age] ×100).[7,8]

Table 5. Nutritional status of the children (*weight for height) (n=130)

Nutritional status (%)	Frequency	Percentage
Normal (≥90%)	100	76.9
Mild wasting (80-90%)	22	16.9
Moderate wasting (70-80%)	6	4.6
Severe wasting (< 70%)	2	1.5

(*Weight for height classification according to Waterlow's classification.
Percent of weight for height= [height of a child/height of a normal child of the same age] ×100.)[7,8]

DISCUSSION

The present study found that the prevalence of stunting among the under five children was 54.6%, wasting 33.1% and underweight 25.4%. The prevalence of stunting, wasting and underweight in this study were higher in Melamchi than in a study done in 2014 in neighboring areas Dolakha and Kavre (39.9% stunting, 7% wasting and 18.9% underweight).[3] Also, comparing with the recent national data, the prevalence of stunting and wasting in Melamchi were higher than that of the whole country (36% stunting, 10% wasting) whereas the prevalence of underweight was slightly less than that of the national data (27% underweight).[6] This difference reflects the higher burden of childhood nutritional problems in the study area.

Almost one fifth of the mothers were of age less than or equal to 20 years. It was seen that there was significant association between prevalence of malnutrition and mothers' age (p value 0.02). More children with mother's age up to 20 years (52.4%) were malnourished than those with mother's age more than 20 years (20.2%). This might be because women with higher age are more experienced and conscious about child care and nutrition.

The present study showed that children of illiterate mothers were more likely to be malnourished than children of literate mothers (p value 0.015). This finding is consistent to the information presented in NDHS 2016 in which the percentage of children with malnutrition is higher as the education level decreases.[6] Likewise, this finding is also similar to a multi-center study in Pakistan which showed a strong association of malnutrition with maternal illiteracy.[9] This is also explainable as educated mothers are more conscious about nutrition and food hygiene making their children at low risk for being malnourished.

Table 6. Association between nutritional status of children and selected socio-demographic variables (according to weight for age; malnutrition) (n=130)

Characteristics	Nutritional Status		p-value
	Normal	Malnutrition	
Mother's age:			
≤20 years	10 (47.6%)	11 (52.4%)	*0.002
> 20 years	87 (79.8%)	22 (20.2%)	
Ethnicity:			
Brahmin /Chhetri	30 (81.1%)	7 (18.9%)	0.285
Janajati and others	67 (72.0%)	26 (28.0%)	
Religion:			
Hindu	87 (75.7%)	28 (24.3%)	0.529
Other than Hindu	10 (66.7%)	5 (33.3%)	
Educational Status:			
Illiterate	18 (58.1%)	13 (41.9%)	*0.015
Literate	79 (79.8%)	20 (20.2%)	
Occupation:			
Housewife	45 (73.8%)	16 (26.2%)	0.835
Other than housewife	52 (75.4%)	17 (24.6%)	
Place of delivery:			
Home delivery	13 (68.4%)	6 (31.6%)	0.570
Institutional delivery	84 (75.7%)	27 (24.3%)	
Exclusive breast feeding:			
< 6 month	43 (75.4%)	14 (24.6%)	0.849
≥6 month	54 (74.0%)	19 (26.0%)	
Sex of the children:			
Male	55 (79.7%)	14 (20.3%)	0.156
Female	42 (68.9%)	19 (31.1%)	
Birth Order:			
First child	45 (75.0%)	15 (25.0%)	0.926
Other than first child (second or more)	52 (74.3%)	18 (25.7%)	
Total	**97 (74.6%)**	**33 (25.4%)**	--

(Note: * indicates statistically significant association with malnutrition)

Likewise, significant association was seen between ethnicity and stunting (p value 0.042). Janajati children were more likely to be stunted than Brahmin/Chhetri children. This might be because Brahmin/Chhetri, being the upper social class ethnicity in the country, the parents might also have been better educated than parents of other ethnicity. Hence, they provide better nutrition and child care, protecting their children from possible risk of malnutrition.

CONCLUSION

From the study it was found that more than half of the children had stunting, one fourth of them had under

weight and nearly one fourth of them had wasting which are higher than the national scenario. The prevalence of malnutrition was higher in children among younger mothers and illiterate mothers as compared to mothers with child birth at olderage and literate mothers. Hence, special consideration should be focused on age of marriage and age of child birth. Awareness programme should be conducted for the illiterate mothers to prevent malnutrition for the children.

ACKNOWLEDGEMENT

We would like to thank Melamchi Municipality office for allowing us for conducting this study in the area. Our grateful thank goes to students of B.Sc. Nursing 12th batch students of KUSMS, first community group for their contribution in data collection.

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Quality of Nursing Work Life among Nurses Working in Nobel Medical College, Biratnagar

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Citation

Ghimire S. Brooks BA Quality of Nursing Work Life among Nurses Working in Nobel Medical College, Biratnagar. *THE CLIFF.* 2018; 1: 38-43.

ABSTRACT

Background

Quality of working life has a significant role in increasing labor productivity in many large organizations. Nurses employed in health care centers play crucial role in achieving health development. But despite of its significant role in patient care, it is still marginalized.

Objective

The objective of the study is to determine the quality of nursing work life among nurses.

Method

A descriptive cross-sectional design was used to determine the quality of nursing work life among nurses working in Nobel Medical College, Biratnagar. Two hundred nurses were selected by simple random sampling technique. The collected data were tabulated and analyzed by using descriptive and inferential statistics.

Result

The overall mean score of quality of working life was at low level with the score of 100.5. The nurses had moderate level of quality of life with regard to work life-home life, work design context and work world whereas high level on work context. Age of nurses and type of unit currently working had significant association with the quality of nursing work life.

Conclusion

The nurses believed that they had heavy work load, less staff during the shift, and low salary. Nurses play a significant role in improving the quality of life of patients. So, measures should be taken to improve their quality of working life.

KEY WORDS

Nurses, Quality, Work life

INTRODUCTION

Quality of nursing work life is a process of getting an insight into organizational effectiveness and how to perform better by stakeholders and organization's employees simultaneously. This concept basically defines the way by which well-being of an employee is safeguarded.[1]

Nurses are among the employees whose lives are mostly affected by the quality of work life due to dynamic changes in the work environment. Poor work conditions and excessive workload are the prime issues in nursing. The quality of work life assessment is a significant and basic effort to deal with this problem.[2]

Nurses being the largest health care providers should get satisfactory quality of life. The study conducted in Iran to determine quality of nursing work life showed that 60% of nurses had moderate level while 37.1% and 2% had undesirable and good quality of working life, respectively.[3]

As the important employee component of hospitals, nurses are crucial to the proper functioning of the organization. And, improvement in employee productivity is a common theme in health care services. Improvement in the quality of nursing work life is a perquisite to increase productivity.[4]

METHODS

A descriptive cross-sectional design was used to determine the quality of nursing work life among nurses working in Nobel Medical College, Biratnagar. The nurses who were willing to participate were selected by simple random sampling technique.

Referring the prevalence of quality of nursing work life to be 56.7%, a sample size of 200 (193 rounded upto 200) was calculated with a confidence level of 95% and allowable error of 7%.

Data was collected using a questionnaire with first section dealing with demographic data in relation to age, marital status, religion, educational qualification, working experience, salary, care giving responsibility, type of educational institution where they have studied and working area. The second section consisted of Brook's Quality of Nursing Work Life Survey which was developed by Brooks and Anderson to assess the Quality of nursing work life. The tool contains statements about nursing work life. Quality of Nursing Work life focuses on four dimensions:- Work life-Home life , Work Design ,Work context and Work World. The tool consists of 41 questions. Each question has a score rating from "1-6". The minimum score is '1- strongly disagree' and maximum score is '6-strongly agree'. The score of QNWL survey ranges from 42-252. The QNWL is divided in to low (42-112), moderate (113-182) and high (183-252) according to the scores. This is same for each subscale.

The data was collected between 1st May to 15th May, 2017. The investigator administered tool to the nurses. The nurses were asked to complete the questionnaire based on their preference towards their work life.

The collected data were coded, entered, cleaned, and analyzed using SPSS version 22. Frequency and percentage distribution was used to determine the level of quality of nursing work life. Chi square test was used to see the association of the quality of nursing work life score with demographic variables.

Ethical clearance from Institutional Review Committee of Nobel Medical College was obtained. An informed consent was administered to each participant before collecting the data.

RESULTS

Table 1 depicts the frequency and percentage distribution of the nurses according to their demographic variables. Maximum numbers i.e. 77.5%of the subjects were in the age group 20-25 years, majority i.e. 64.5%of the subjects were unmarried, majority i.e.90%of the subjects belonged to Hindu religion, maximum of 76% subjects had completed Proficiency in certificate level Nursing, majority i.e.92 % studied nursing in private institution, 45% had working experience less than one year, majority of the subjects 60.5%had monthly salary form ten thousand and one to fifteen thousand, 55.5%were working in general ward, majority of the respondents 44.5%had responsibility of caring children and elderly at home.

Table 2 depicts the frequency and percentage distribution of the items in quality of nursing work life scale. Majority of the nurses were able to balance their work with their family needs. Maximum number of nurses stated the importance of having crèche facilities in hospital. Majority of them felt there was adequate supervision and feedback from the supervisors. Maximum number of nurses had good communication with other employees and felt respected by physicians in work setting. Majority of them feels secured in working environment and believed work setting provides career advancement facilities. Maximum number of nurses believed that the salary is inadequate but feels that they have a secured job.

Table 4 depicts the results of quality of nursing work life. The overall mean score of the level of quality of working life was at low level with the mean score of 100.50 and standard deviation of 57.88. The nurses had high level of quality of life based on work context and moderate level with regard to work world, work life-home life and work design context.

Above table envisage the outcome of chi square analysis being carried out to bring out the association between the quality of nursing work life scores with their demographic variables. Age and type of unit currently working had significant association with quality of nursing work life.

Table 1. Socio-demographic information of respondents (n=130)

	Categories	Frequency	%
Age (in years)	Less than 20	5	2.5
	20-25	155	77.5
	More than 25	40	20
Marital status	Married	69	34.5
	Unmarried	129	64.5
	Separated	2	1
Religion	Hindu	180	90
	Christian	8	4
	Buddhists	12	6
Educational qualification	Auxiliary Nurse Midwife	19	9.5
	Proficiency in Certificate level Nursing	152	76
	Bachelor of Science in Nursing	29	145
Working experience	<1	90	45
	1 - 3 years	70	35
	< 3 years	40	20
Salary	Below 10000	22	11
	10001 - 15000	121	60.5
	15001 - 20000	51	25.5
	Above 20001	6	3
Type of educational institution	Private	184	92
	Government	16	8
Working area	Critical care	48	24
	Emergency room	14	7
	General ward	111	55.5
	OT	27	13.5
Care giving responsibility	Have children and elderly people at home	89	44.5
	Either have children or elderly people at home	46	23
	Do not have children or elderly people at home	65	32.5

Table 2. Opinions of nurses regarding the working life (n=200)

Items	Agree(f,%)	Disagree(f,%)
I am able to balance work with my family needs.	165 (82.5)	35 (17.5)
It is important for a hospital to offer employees on-site ill child care services.	194 (97.0)	6 (3)
I have energy left after work.	138 (69)	62 (31)
Rotating schedules negatively affect my life.	110 (55)	90 (45)
My organization's policy for family-leave is adequate.	115 (57.5)	85 (42.5)
It is important for a hospital to offer their on-site child care services.	184 (92)	16 (8)
I receive a sufficient amount of assistance from nursing assistants and service workers.	158 (79)	42 (21)
I receive quality assistance from unlicensed support personnel.	148 (74)	52 (26)
I am satisfied with my job.	144 (72)	56 (28)
My workload is too heavy.	158 (79)	42 (21)
I have autonomy to make patient care decisions.	146 (73)	54 (27)
I perform many non-nursing tasks.	106 (53)	94 (47)
I experience many interruptions in my daily work routine	132 (66)	68 (34)
I have enough time to do my job well.	138 (69)	62 (31)
There are enough Nurses in my work setting.	96 (48)	104 (52)
I am able to provide good quality patient care.	164 (82)	36 (18)
It is important to have a designated, private break area for the nursing staff.	93 (46.5)	107 (53.5)
I am recognized for my accomplishments by my nurse manager/supervisor.	177 (88.5)	23 (11.5)
My nurse manager/supervisor provides adequate supervision.	168 (84)	32 (16)
I am able to participate in decisions made by my nurse manager/supervisor.	176 (88)	24 (12)
Upper-level management has respect for nursing.	145 (72.5)	55 (27.5)
I receive feedback on my performance from my nurse manager/supervisor	182 (91)	18 (9)
Nursing policies and procedures facilitate my work.	174 (87)	26 (13)
I am able to communicate well with my nurse manager/supervisor.	178 (89)	22 (11)
There is a teamwork in my work setting.	180 (90)	20 (10)
I communicate well with the physicians in my work setting.	172 (86)	28 (14)
I feel respected by physicians in my work setting.	158 (79)	42 (21)
I am able to communicate with other therapists (physical, respiratory, etc.)	176 (88)	24 (12)
Friendships with my co-workers are important to me.	185 (92.5)	15 (7.5)
I receive support to attend in-services and continuing education programs.	174 (87)	26 (13)
My work setting provides career advancement opportunities.	157 (78.5)	43 (21.5)
It is important to me to have nursing granting programs through my work setting.	123(61.5)	77 (38.5)
The security department provides a secure environment.	141 (70.5)	59 (29.5)
I have adequate patient care supplies and equipment.	131 (65.5)	69 (34.5)
I feel safe from personal harm (physical, emotional, or verbal) at work.	148 (74)	52 (26)
I feel a sense of belonging in my workplace.	165 (82.5)	35 (17.5)
In general, society has accurate image of nurses.	139 (69.5)	61 (30.5)
My salary is adequate for my job given the current job market conditions.	80 (40)	120 (60)
I would be able to find the same job in another organization with about the same salary and benefits.	146 (73)	54 (27)

I feel my job is secure	124 (62)	76 (38)
My work impacts the lives of patients/ families.	173 (86.5)	27 (13.5)
It is important for a hospital to offer employees on-site daycare for elderly parents.	126 (63)	74 (37)

Table 3. Quality of nursing work life scores in nurses n=200

Qnwl Scale	Maximum Score		Mean	Standard Deviation
Total QNWL	42-252	Low (42-112) Moderate (113-182) High (183-252)	100.50	57.88
Work life-home life	7-42	Low (7-18) Moderate (19-29) High (30-42)	26.83	4.4
Work design	10-60	Low (10-26) Moderate (27-44) High (45-60)	41.48	8.3
Work context	20-120	Low (20-38) Moderate (39-77) High (78-120)	87.38	18.64
Work world	5-30	Low (5-12) Moderate (13-20) High (21-30)	20.02	4.6

Table 4. Association between quality of nursing worklife scores and demographic variables (n=200)

Demographic variables	Categories	Frequency	Quality of life		χ^2 value	P value
			Moderate	High		
Age	Less than 20	5	2	3	18.50	0.00009
	20-25	155	25	130		
	More than 25	40	19	21		
Marital status	Married	69	21	48	3.28	0.069
	Unmarried	131	25	106		
Religion	Hindu	180	21	48	0.80	0.37
	Others	20	25	106		
Educational qualification	Auxiliary Nurse Midwife	19	5	14	0.21	0.90
	Proficiency in Certificate level	152	35	117		
	Bachelor of Science in Nursing	29	6	23		
Years of working experience	<1	90	16	74	2.70	0.26
	1 - 3 years	70	20	50		
	< 3 years	40	10			
Salary	Below 10000	22	5	17	2.37	0.49
	10001-15000	121	31	90		
	15001-20000	51	8	43		
	Above 20001	6	2	4		
Type of educational institution	Private	184	43	141	0.18	0.67
	Government	16	3	13		
Type of unit currently working	Critical care	48	9	39	9.83	0.02
	Emergency room	14	1	13		
	General ward	111	34	77		
	OT	27	2	25		
Care giving responsibility	Have children and elderly people at home	89	16	73	2.35	0.31
	Either have children or elderly people at home	46	13	33		
	Do not have children or elderly people at home	65	17	48		

DISCUSSION

The objective of the study was to identify the quality of nursing work life among nurses. Quality of nursing work life affects the patient's quality of life. The nurses with good quality of life can render quality care to the patients.

Nurse's lives are fully affected by the level of quality of work life. Job dissatisfaction, poor working conditions are the issues in nursing. In the present study, the majority of the nurses were satisfied with their job. But the quality of working life was still low. Contrasting findings were reported in the study conducted on Iran showed that quality of working life is at moderated level and only 3.6% of nurses were satisfied with their work.[2] Similar findings were reported on a study done on Coimbatore in which majority of the nurses were satisfied with their career as a nurse.[5] The study done on Maharashtra, India reported that the nurses in the government settings were more satisfied. The government nurses were satisfied with the salary, continuing education programmes and the promotion options.[6]

The study was aimed to identify the predictors of the nurses' QWL reported that nurses had heavy workload. This was the major factors for poor quality of work life and job dissatisfaction.[7] The nurses reported that they don't have adequate staffs in their work setting. Inadequate staffing is another main factor which contributes to excess work load, dissatisfaction and high turnover rate. This eventually results into inadequate time to provide quality patient care.

The predictors of job satisfaction were age, work experience and the flexibility in shift duty rotation reported in a study done in Trichy.[8] The direct patient care and quality of care are also an important predictors of job satisfaction.[9] Job satisfaction has inverse relationship with stress.[10]

In the present study, majority of the nurses were satisfied with their job. Contrasting findings were found on study conducted in Korea that nurses were least satisfied with their work.[11]

Evidence from various studies shows that lack of healthy work environment is directly linked to shortages of nurses, poor quality of nurse's work life, poor patient outcomes and job dissatisfaction.[12,13]

Salary is the other strong marker for job satisfaction among the employees. It influences the intention to leave the job as well as job satisfaction. The present study concluded that 60% of the nurses believed that salary was not adequate for them. This was in accordance with the results of the study conducted on Iran reported that two thirds of the nurses reported that salary was low.

The majority of the nurses in the present study believed that they were able to balance work with family needs. This result was in contrast with the findings in which majority of nurses reported that the balance between total life environment and work was low.[14]

The results of present study showed that there was significant association between qualities of nursing work life scores with demographic variables like age and type of unit currently working. The findings were in contrary with the study conducted in Iran which reported that age, marital status, educational status; experience had no association with quality of nursing work life.[3] A significant association was found between educational level, experience, type of hospital with the quality of nursing work life score.[15]

The study is conducted in single setting, so the sample size is small. Therefore, the results cannot be generalized over a larger population.

CONCLUSION

The present study assessed the quality of nursing work life among nurses. The study revealed that the nurses had low quality of nursing work life. The quality of human life is related to quality of work life. A quality work life assessment is a basic and important effort to deal with this issue. The study related to quality of work life should be conducted in health care settings. A similar study can be conducted in larger scale to determine problems and challenges faced by nurses. The major factors that influence their work life can be identified to address the issue.

ACKNOWLEDGEMENT

The authors would like to express sincere thanks to all the nursing incharges, staffs and participants for their cooperation and participation in this study and to Dr. Beth Brooks for providing permission to use the tool for the study purpose.

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Assessment of Health Condition among Brick Kiln Workers in Kathmandu Valley, Nepal

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Citation

Prajapati LM, Sanjel S, Joshi SK. Assessment of Health Condition among Brick Kiln Workers in Kathmandu Valley, Nepal. *THE CLIFF.* 2018; 1: 44-9.

ABSTRACT

Background

Brick manufacturing industry in Nepal is one of the fastest growing industrial sectors in Kathmandu Valley. The industry brings more work opportunities in rising numbers, but contributes as one of the highest contributor of health hazards among people with low socioeconomic status.

Objective

To determine socio-demographics characteristics of brick kiln workers and to assess health conditions of brick kiln workers in Kathmandu Valley.

Method

Applying a cross sectional study design, health examinations were completed during February-March 2015 using a health assessment pro forma targeting brick kiln workers in Kathmandu Valley. Health assessment was done for 400 brick kiln workers from 16 brick kilns. Brick kilns workers who had been working for more than one year were included in the study. Proportions, means and ranges were calculated for socio-demographics and health conditions. Chi square (χ^2) test was applied to compare the difference of occurrence of illnesses and injuries among brick kiln workers in work zones at $p<0.05$ level. Statistical analyses were performed using the IBM SPSS Statistics 21.

Result

Significant proportion of <19 years and >70 years of workers were employed in the brick industries. Educational achievement was minimal and higher ever smokers (40.0%) and current smokers (84.0%) among smokers. The prevalence of illnesses were anemia (2.8%), conjunctivitis (8.0%), hearing loss (2.8%), and dermatitis (25.5%) and skin allergies (25.5%) with significant association with anemia, dermatitis and skin allergies on the work zone ($p<0.05$). The prevalence of injuries were musculoskeletal deformities (40.0%), burns marks (8.5%), cut injuries/marks (36.3%) and evidence of fractures (16.0%) with significant relationships with musculoskeletal deformities, burns/burn marks, cut injuries/marks and fracture injuries/marks within the work zone ($p<0.05$).

Conclusion

Vulnerable population who had risk behavior was the major groups of workers. Protection of health of workers is urged strategy in the brick kilns because brick kiln is the workplace having high level of hazards especially based on the work zones.

KEY WORDS

Brick kiln workers, Brick manufacturing industry, Health conditions, Work zones

INTRODUCTION

The brick manufacturing industry has become one of the fastest growing industrial sectors in Nepal.[1] Despite this industry brings more work opportunities with rising in the numbers, this also serves as one of the highest contributors to the pollutions and related illnesses among brick kiln workers and the surrounding community.[2,3] Brick kilns are the most polluted worksite in Nepal, causing respiratory, gastrointestinal, reproductive, psychosocial and skin diseases.[4,5] Brick kiln workers face varieties of illnesses in higher number than other occupations with minimal occupational safety and in negligible amount of health services in Nepal.[6,7] Additionally, the studies on occupational safety and health are also few in Nepal.[4,7,8]

It is found that the range of age is 12-73 years indicating exploitation of <18 years children (20.0%) and >60 years old people (3.8%), and male population with low literacy level (40.5%).[7] Majority of the brick kiln workers are seasonal migrant involving in the brick manufacturing from long period of time.[5,7,9,10] It is evident that poor socio-demographic status contributes adverse consequences on the health of workers.[2,10,11]

The occurrence of injuries during brick work is 52.0% accounting cuts/bruises/open wounds (29.8%), injuries on leg/foot (34.8%), back (12.0%), shoulder (7.0%), arms/ hands (23.2%), head (7.8%), eyes/ ears (0.5%), abdomen (2.0%), and hip (0.5%).[7] The incidence of illness during brick work is 88.5% with shortness of breath (31.5%), persistent cough (27.2%), skin diseases (14.8%), stomach illnesses/ diarrhea (21.5%), fever (37.0%), headache (58.2%), extreme fatigue (64.5%), feeling weak (68.2%) and overall body ache (19.8%).[7] Although there is a high prevalence of injuries/illnesses, the health interventions are very poor in the brick kilns.[4,5,7] This study was conducted to determine socio-demographics and health conditions of brick kiln workers.

METHODS

General health examinations were carried out in Kathmandu valley, applying the cross sectional study design, which includes three densely populated districts (Kathmandu, Lalitpur and Bhaktapur), targeting brick kiln workers. There were 106 operating brick kilns in Kathmandu Valley at the time of the health examinations (Bhaktapur: 62 brick kilns, Lalitpur: 26 brick kilns and Kathmandu: 18 brick kilns). First, all the brick kilns were visited and added as part of the potential sampling frame. Multi-stage probability proportionate to size (PPS) sampling was applied to select brick kilns and brick kiln workers.[12] In total, 9 kilns from Bhaktapur, 4 kilns from Lalitpur and 3 kilns from Kathmandu district were selected. A total of 400 brick kiln workers from Bhaktapur, Lalitpur, and Kathmandu districts were recruited proportionately for the interviews. Only brick kilns workers who had been working for more than one year were included in the study. Health examinations were completed during February - March 2015 using a health examination pro forma.

To include workers from all work zones of brick kiln, a strategy was developed based on grouping workers with similar job duties within a production unit of a plant, which is called similar exposed groups (SEGs).[13,14] Brick kiln similar exposed groups are commonly classified into work zone as green brick molding (GBM), green brick stacking/ carrying (GBS/C), red brick loading/carrying (RBL/C), coal preparation/carrying (CP) and firemen (FM). It stands to reason that different job classifications may result in widely different levels of exposure to hazards.

Proportions, mean, median and range were calculated for socio-demographics (age, gender, marital status, schooling and duration of work) and health conditions. Chi square (χ^2) test was applied to compare the difference of occurrence of illnesses and injuries among work zone. The level of significance was set at $p<0.05$. Statistical analyses were performed using the IBM SPSS Statistics 21.

Ethical approval for study was obtained from the institutional review committee of Kathmandu University School of Medical Sciences. Participation in the study was voluntary and informed consent was obtained from the brick kiln owners before examining the workers. Written consent (or a thumb print in the case of illiterate workers) to publish the data was obtained from each worker before interview

RESULTS

Among 400 brick kiln workers, almost 20.0% of workers were less than 19 years of age. The mean±SD age of workers was 31.74±12.97 years with a range of 12 to 73 years. Among those, 63.0% of brick workers obtained only primary education. Almost 40.0% workers were ever smokers and among smokers, 84.0% of workers were current smokers (Table 1). Among workers, 20.0% were from GBM and GBS/S each, 21.0% were from RBL/C, 18.8% were from CP, and 20.2% of them were FM zones (fig. 1).

Illnesses/injuries were assessed through health examinations among brick kiln workers. The prevalence of anemia was almost three percent, conjunctivitis was eight percent, hearing loss was almost three percent, and dermatitis and skin allergies were each 25.5% (Fig. 2). Anemia, dermatitis and skin allergies were significantly different for the WZs ($p<0.05$) (Table 2).

Musculoskeletal deformities were found in 40.0% of workers, burns marks were found in 8.5%, cut injuries/ marks were found in 36.3% and evidence of fractures were found among 16.0% among brick kiln workers (Figure 3). Occurrence of musculoskeletal deformities, burns/burn marks, cut injuries/marks and fracture injuries/marks were significantly different for work zone ($p<0.05$) (Table 3).

Table 1. **Socio-demographic information of the respondents (n=400)**

Socio-demographic characteristics	Frequency	%
Age group		
≤19 years	81	20.2
20 - 29 years	119	29.8
30 - 39 years	84	21.0
40 - 49 years	68	17.0
50 - 59 years	33	8.2
60 - 69 years	11	2.8
≥70 years	4	1.0
Gender		
Female	102	25.5
Male	298	74.5
Caste		
Brahmin/Chhetri	27	6.8
Janajati	130	32.5
Dalit	138	34.5
Madhesi	95	23.8
Muslim	10	2.5
Birthplace		
Within district	14	3.5
Outside district	185	46.3
India	201	50.3
Migration		
Always live in work site	136	34.0
Move every season	264	66.0
Level of education		
Primary	102	63.0
Lower secondary	43	26.5
Secondary and higher secondary	14	8.6
University	3	1.9
Duration of work (in years)		
≤5 years	265	66.2
6-10 years	63	15.8
11-15 years	30	7.5
16-20 years	23	5.8
≥21 years	19	4.8

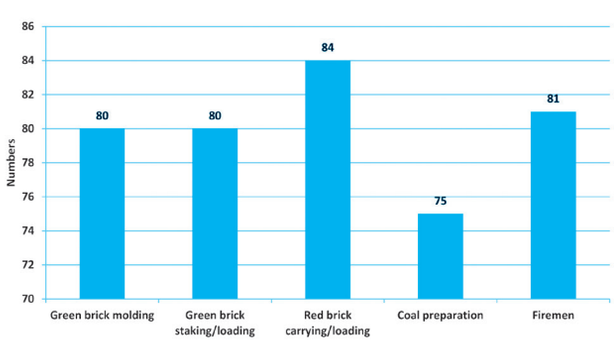

Figure 1. **Distribution of brick kiln workers among different work zones (n=400)**

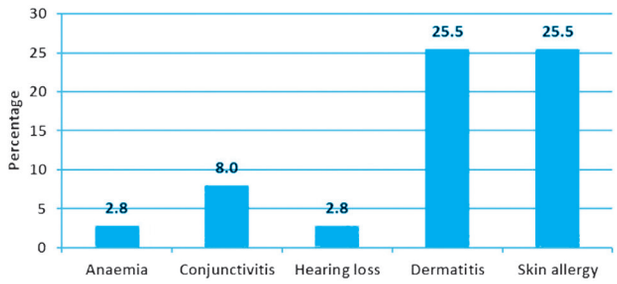

Figure 2. **Occurrence of illnesses among brick kiln workers (n=400)**

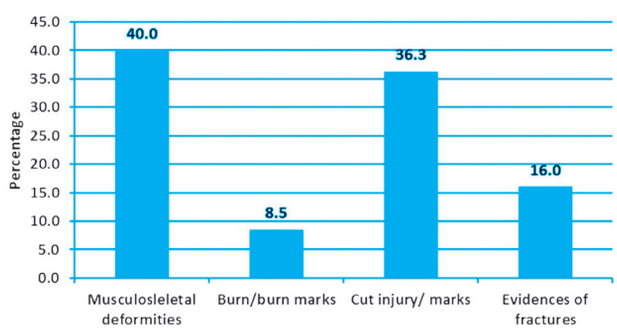

Figure 3. **Occurrence of injuries among brick kiln workers (n=400)**

Almost half of workers received health services within last annum with the median expenditure of Rs. 5000.00 with the range of Rs. 100.00 - 3,00,000.00. Nearly one fourth of the workers borrowed money for health care which was with median of Rs. 20,000.00 with the range of Rs. 500.00 – 2,00,000.00 (Table 4).

DISCUSSION

In this study, only 3.5% of the brick kiln workers were from within the Valley districts, 46.3% were from outside the valley districts and interestingly 50.3% of the workers were from India with two thirds (66.0%) being seasonal migrant workers, as revealed in the study conducted by Jha et al. in 20169. In this present study, almost 60.0% of the workers were illiterate, and among the literate, 63.0% of them achieved primary level of education followed by lower secondary (26.5%), Secondary/ higher secondary (8.6%) and University (1.9%) degrees. In this present study, 66.2% were involved in brick work for ≤5 years, followed by 6-10 years (15.8%), 11-15 years (7.5%), 16-20 years (5.8%) and ≥21 years (4.8%). Contrasted with findings from this study, a study conducted in India found that the workers involved in brick industry works for < 3 years (14.6%), 3-5 years (52.7%) and >5 years (32.7%)15.

Introduction of potentially detrimental matters, for example gases and particulate matter from modern industrial civilization, is recognized as having a tremendous negative and harmful impact on living organisms including human

Table 2. Illnesses among similar exposure groups (n=400)

Illnesses	Work zones					p value
	Green brick molding	Green brick staking	Red brick loading	Coal preparation	Fireman	
Anaemia						
Absent	73 (91.3%)	78 (97.5%)	83 (98.8%)	74 (98.7%)	81 (100.0%)	0.006**
Present	7 (8.8%)	2 (2.5%)	1 (1.2%)	1 (1.3%)	0(0.0%)	
Conjunctivitis						
Absent	76 (95.0%)	78 (97.5%)	75 (89.3%)	65 (86.7%)	74 (91.4%)	0.090
Present	4 (5.0%)	2 (2.5%)	9 (10.7%)	10 (13.3%)	7 (8.6%)	
Hearing loss						
Absent	80 (100.0%)	78 (97.5%)	79 (94.0%)	74 (98.7%)	78 (96.3%)	0.175
Present	0 (0.0%)	2 (2.5%)	5 (6.0%)	1 (1.3%)	3 (3.7%)	
Dermatitis/skin problems						
Absent	65 (81.3%)	61 (76.3%)	52 (61.9%)	57 (76.0%)	63 (77.8%)	0.048*
Present	15 (18.8%)	19 (23.8%)	32 (38.1%)	18 (24.0%)	18 (22.2%)	
Skin allergy						
Absent	68 (85.0%)	63 (78.8%)	49 (58.3%)	57 (76.0%)	61 (75.3%)	0.002**
Present	12 (15.0%)	17 (21.3%)	35 (41.7%)	18 (24.0%)	20 (24.7%)	

Table 3. Injuries/injury marks among similar exposure groups (n=400)

Injuries/injury marks	Work zones					p value
	Green brick molding	Green brick staking	Red brick loading	Coal preparation	Fireman	
Musculoskeletal deformities						
Absent	37 (46.3%)	56 (70.0%)	43 (51.2%)	46 (61.3%)	58 (71.6%)	0.002**
Present	43 (53.8%)	24 (30.0%)	41 (48.8%)	29 (38.7%)	23 (28.4%)	
Burns/ burn marks						
Absent	79 (98.8%)	76 (95.0%)	81 (96.4%)	62 (82.7%)	68 (84.0%)	<0.001**
Present	1 (1.3%)	4 (5.0%)	3 (3.6%)	13 (17.3%)	13 (16.0%)	
Cuts injuries/ marks						
Absent	72 (90.0%)	48 (60.0%)	33 (39.3%)	48 (64.0%)	54 (66.7%)	<0.001**
Present	8 (10.0%)	32 (40.0%)	51 (60.7%)	27 (36.0%)	27 (33.3%)	
Fractures injuries/ marks						
Absent	79 (98.8%)	66 (82.5%)	70 (83.3%)	49 (65.3%)	72 (88.9%)	<0.001**
Present	1 (1.3%)	14 (17.5%)	14 (16.7%)	26 (34.7%)	9 (11.1%)	

Table 4. Receiving health services and its costs for brick kiln workers (n=400)

Receiving health services	Frequency	Percentage
No	209	52.3
Yes	191	47.8
Health care expenditure	Median: Rs. 5,000.00; Range: 100.00 - 3,00,000.00	
Borrowing money for the medical care or medicines		
No	308	77.0
Yes	92	23.0
Amount of money borrowed	Median: Rs. 20,000.00; Range: Rs. 500.00 – 2,00,000.00	
Became able to pay off this debt yet		
No	60	65.2
Yes	32	34.8

health.[16] There are multiple risk factors and the illnesses are directly related with biomechanical, psychosocial, nutritional, clinical and respiratory ailments.[15] Hazards in the brick kilns cause human injuries and increase economic cost by decreasing working capacity.[17] A study found that the low quality physical environment and working conditions and practices in brick industries has contributed to musculoskeletal injuries and chronic health ailments18. Biomechanical analysis pointed out that the workers are continuously adapting awkward postures, such as squatting, bending and lifting, resulting in severe back pain and constant aches in the hands and feet. In terms of nutritional status, most of the women were emaciated and malnourished.[15] In our study, illnesses were assessed through health examinations among brick kiln workers. The prevalence of anemia was almost three percent,

conjunctivitis was eight percent, hearing loss was almost three percent, dermatitis was 25.5% and skin allergy was 25.5%. In a previous study, it was found that irritation of skin and eyes were ranked highest.[19] In this study, anemia, dermatitis and skin allergy were significantly different for the work zone ($p<0.05$). In a previous study it was found that most of the workers were emaciated and malnourished.[15]

Joint and bone deformities, musculoskeletal discomforts from repetitive motion, blistered hands, bruised feet from dropped bricks, lacerations, breathing difficulties, malnutrition, bacterial and viral diseases, and injuries from moving vehicles were the major injuries in the brick industry.[20] In our current study, injuries and injury marks were assessed by examination of the brick kiln workers. Musculoskeletal deformities (MSDs) were found in 40.0%, burns marks 8.5%, cut injury/ marks 36.3% and evidence of fractures were 16.0% among brick kiln workers. In addition, occurrence of musculoskeletal deformities, burns/burn marks, cut injuries/marks and fracture injuries/marks were significantly different for WZs ($p<0.05$). A similar type of study carried out in Asam, India, revealed that 90.5% of the workers had anemia, 73.9% had general weakness and 66.6% had yellow conjunctiva, 73.6% workers were feeling dizziness during working time, 96.8% had pallor on the palm of the hand, 82.2% workers were identified fatigue symptoms, 63.3% had examined presence of bitot's spots on the eyes.[21] A previous study revealed that workers in brick kilns are prone to musculoskeletal disorders.[22] The extent of occurrence of illnesses and injuries were directly correlated with the duration of work.[23] It is evident that prolonged sitting in squatted postures causes numbness in the lower legs resulting from lack of blood supply due to sustained muscle compression, which in turn leads to MSDs.[15]

The study was only based on the physical examination. Any laboratory or radiological test could not be carried out. Due to logistic constraints anthropometrical assessment to assess nutritional status could not be done.

CONCLUSION

The use of vulnerable groups of workers was high in brick industry. Protecting their health in terms of injuries/ illnesses is one of the priority matters. As the literacy rate of these groups are significantly low, education concerning prevention of injuries/illnesses should be the focus of programs. Exposure to smoking along with exposure to dusts further aggravates health, especially respiratory health, of the brick kiln workers. An anti-smoking campaign needs to be conducted in the brick kilns to aware them of the injurious effects of smoking. The intake of a balanced diet is out of their capacity with their earnings. When assessments of illnesses of workers were done obtaining their work type, the workers involved in the GBM, GBS/C and RBL/C had high level of illnesses. The conditions demand pre-placement and periodic health examination of the workers as well as consideration for protection of the health of workers who are involved in these particular tasks.

ACKNOWLEDGEMENTS

Our acknowledgments go to the health personnel who were involved in the health examinations. We thank brick kiln owners and workers.

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Perceived Stress and Coping Strategies Regarding Pubertal Changes among Adolescent School Girls of Dharan, Nepal

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Citation

Shrestha B. Karn BK. Chaudhary R Perceived Stress and Coping Strategies Regarding Pubertal Changes among Adolescent School Girls of Dharan, Nepal. *THE CLIFF.* 2018; 1: 50-5.

ABSTRACT

Background

Adolescence is a major transitional period when they experience biological, psychological and social changes. The changes that occur during puberty appear to be risk factors for stress for which different coping strategies are adopted by the adolescents.

Objective

To assess the perceived stress regarding pubertal changes and coping strategies used for resolution of perceived stress among adolescent school girls of Dharan.

Method

A descriptive cross-sectional design was used including 628 adolescent girls of age 10-15 years by using proportionate random sampling technique. Data were collected by using structured questionnaire. Self-developed scales were used to measure perceived stress and coping strategies. Mean, median, One Way ANOVA, independent t-test and correlation was used for statistical analysis.

Result

The mean age ± SD of adolescent school girls was 14 ±0.9 years. The mean age ± SD at menarche was 12.38 ± 1.41 years. Out of maximum score 165, the mean score of perceived stress was found to be 78.18 ± 20.17 and out of maximum score 155, the mean score of coping strategies was 79.08 ± 16.17. The major stressor for perceived stress regarding pubertal changes is physical changes and more frequently utilized coping strategies was keeping feelings to oneself followed by seeking spiritual support.

Conclusion

There was positive correlation between perceived stress regarding pubertal changes and coping strategies. Adolescents perceive stress regarding pubertal changes for which they use different coping strategies. Information regarding pubertal changes helps to increase coping for resolution of stress perceived by adolescent school girls.

KEY WORDS

Coping Strategies, Nepal, Perceived Stress, Pubertal Changes

INTRODUCTION

Adolescence is a period of transition from childhood into adulthood.[1] It is generally regarded as the psychological, social and maturational process initiated by the pubertal changes. The dramatic changes of rapid hormonal, physiological and physical changes during puberty might be expected to engender some psychological effects, insofar as they represent a developmental transition for which the individual is not always fully prepared.[2]

Stress is most common among adolescents because of rapid physical, psychological, social and sexual changes during adolescence.[3]

Adolescents who report high levels of perceived stress are at high risk for negative outcomes, such as depression, substance abuse, academic underachievement, and diminished life satisfaction.[4]

Girls experienced more stress and psychological difficulties during pubertal years and puberty was related to acceleration in the development of unhealthy behaviors.[1]

The conceptualization of perceived stress allows for consideration of resources like coping by certain individuals which will allow experiencing external stress without experiencing compromised functioning.[5] To deal with the psychological, physical, cognitive, and social challenges of adolescence successfully, the adolescent must employ a variety of coping strategies. The coping methods, whether adaptive or maladaptive, can impact on emotion, behavior, and social development.[6]

As adolescents are vulnerable groups, there is need to focus studies among adolescents group and need to focus on their physical and psychological problems. Thus this study was conducted to assess perceived stress related to pubertal changes among adolescent girls, and to assess what coping strategies they are using for resolution for their perceived stress.

METHODS

This descriptive cross sectional research was conducted among adolescent school girls studying in lower secondary, secondary and higher secondary schools of Dharan Municipality; in Nepal from 4th Nov to 7th Dec 2012. Proportionate random sampling technique was used to select schools for the study. There were eighty one lower secondary, secondary and higher secondary schools in Dharan Municipality according to the list provided by Dharan Municipality Office, Sunsari. Out of these schools, 61 schools were private schools and rest was governmental schools, i.e. the ratio of government and private schools were approximately 1:3. For sampling, a list of these 81 schools was made and 10% of schools were selected by proportionate random sampling technique i.e. 2 government and 6 private schools were selected by lottery method. Then all adolescent girls i.e. 628 girls from selected schools who meet eligibility criteria were included in the study. Adolescent school girls of age 10-15 years who already had menarche and willing to participate were included in study. But adolescents with diagnosed psychiatric morbidities were excluded.

A structured questionnaire was developed on basis of literature review. Perceived stress scale was constructed by reviewing related literatures6. This scale consists of 33 items with four different domains. All stressor items were measured using a five point likert scale ranging from 1 (never) to 5 (very often). Similarly, scale related to coping strategies was constructed based on related literatures.[7,8] This tool included 31 items. The frequency of coping strategy utilization was assessed using a five point likert scale ranging from 1 (never) to 5 (very often).

Validity of the tool was established by extensive literature review, consultation with advisor, subject specialists. Pretesting was done in two schools of Dharan: one government and one private school which were excluded from the main study. Necessary modification was done after pretesting. The questionnaire was translated into Nepali and reverse translation was done. Reliability analysis was done by Cronbach's alpha reliability coefficient test which reveals Cronbach's alpha reliability for perceived stress was □ = 0.790 and Cronbach's alpha reliability for coping strategies was □ = 0.718.

Ethical approval was obtained from Institutional Ethical Review Board of BP Koirala Institute of Health Sciences. Permission was obtained from Municipality Office, District Education Office, and authority of respective school to conduct study. Verbal informed consent was obtained and voluntary participation of the respondents was carried out.

For Statistical analysis, Statistical Package for Social Sciences (SPSS) 16 version was used. Frequency, mean, median, percentage for descriptive statisticas and OneWay ANOVA, Independent t-test and Pearson and Spearman's correlation were applied to find out the relationship between dependent and independent variables at 95% confidence interval.

RESULTS

Table 1 depicts that significant percentage (36.5%) of the respondents were of age 15 years. More than two-third (78.8%) of the respondents were Hindu. Half (50.2%) of respondents were disadvantaged Janajatis. More than two third (73.4%) of the respondents were from private schools. More than one fourth (28.8%) of the respondents were from eighth standard in school. Significant number of the respondents (40.1%) had menarche at the age of 13years, followed by 12 years (36.9%). The respondents' mean age ± SD at menarche in years was 12.38 ± 1.41. Most (91.6%) of the respondents had prior information about pubertal changes.

Table 1. Socio-demographic characteristics of respondents (n=628)

Characteristics	Category	Frequency	Percentage
Age (in Years)	Twelve	37	5.9
	Thirteen	152	24.2
	Fourteen	210	33.4
	Fifteen	229	36.5
Religion	Hindu	495	78.8
	Kirat	42	6.7
	Buddhist	49	7.8
	Christian	37	5.9
	Muslim	5	0.8
Ethnic Group	Dalit	35	5.6
	Disadvantaged Janajatis	315	50.2
	Disadvantaged not-Dalit Terai caste groups	26	4.1
	Religious minorities	5	0.8
	Relatively advantaged Janajatis	125	19.9
	Upper caste groups	122	19.4
Type of School Studying in	Government	167	26.6
	Private	461	73.4
Grade of students	Six	48	7.6
	Seven	170	27.1
	Eight	181	28.8
	Nine	139	22.1
	Ten	90	14.3
Age at Menarche (in years)	Ten	10	1.6
	Eleven	65	10.4
	Twelve	232	36.9
	Thirteen	252	40.1
	Fourteen	60	9.6
	Fifteen	4	0.6
	Don't know	5	0.8
Mean Age at Menarche(12.38 ±1.41years)			
Prior information regarding pubertal changes	Yes	575	91.6
	No	53	8.4

Table 2 depicts that out of total obtainable score of 165, the mean Perceived Stress Score (PSS) among respondents was 78.18 with standard deviation (SD) 20.17. Similarly the mean perceived stress score of respondents with domains of pubertal changes like physical changes was 31.35 with SD 9.06., with social comparisons were 12.22 with SD 4.61, with family and peers relations were 17.43 with SD 5.63 and with cultural events were 17.18 with SD 7.51.

Table 3 displays that most common coping strategies used by adolescents girls for perceived stress was keeping feelings to themselves (70.8%). The mean score of overall coping strategies was 79.08 with standard deviation 16.17.

Table 4 depicts that there was significant association of socio-demographic variables religion, ethnicity and type of school studying in with domain perceived stress regarding cultural events.

The type of school adolescents studying in has significant association with overall perceived stress score and coping strategies score.

Similarly the respondents' prior awareness on pubertal changes has significant association with domain perceived stress on family and friends relations as well as with coping strategies score.

Besides that age of the respondents had positive correlation with perceived stress regarding pubertal changes($r = 0.132$, $p=0.001$), its two domains: stress regarding physical changes($r = 0\ 133$. $p=0.001$) and stress regarding family and peer relations ($r = 0.112$. $p=0.005$) and coping strategies for perceived stress ($r = 0.108$. $p<0.05$)

Similarly perceived stress regarding pubertal changes of respondents had positive correlation with coping strategies($r = 0.454$. $p<0.001$)

DISCUSSION

The finding of the study showed that mean percentage score for Perceived Stress was 47.38 and for its domains were 52.25% for physical changes, 40.73% for social comparisons, 49.8% for family and peers relations and 42.95% for cultural events. This is inconsistent with the finding of a study conducted in Pakistan which showed mean percentage score for perceived stress among

Table 2. Perceived stress domains regarding pubertal changes (n=628)

Perceived Stress Domains	No. of Items	Obtainable Value	Obtained score range	Mean ±SD	Mean Percentage Score ±SD
Stress regarding Physical Changes	12	12 – 60	12-57	31.35±9.06	52.25 ± 15.10
Stress regarding Social Comparisons	6	6 – 30	6-30	12.22±4.61	40.73± 15.36
Stress regarding Family and Peers Relations	7	7 – 35	7-33	17.43±5.63	49.80 ± 16.08
Stress regarding Cultural Events	8	8 – 40	8-40	17.18±7.51	42.95 ± 18.77
Perceived Stress Score	33	33 – 165	33-146	78.18±20.17	47.3± 12.22

Table 3. Coping strategies for perceived stress (n=628)

Coping Strategies Domains	No. of Items	Obtainable Value	Obtained range	Mean ± SD / Median (IQR)	Mean/ Median Percentage Score
Keeping to themselves	1	1-5	1-5	3.54 ± 1.26	70.80 ± 25.20
Suppression	1	1-5	1-5	2 (1-3)	40.0± 26.60
Social Isolation	1	1-5	1-5	1 (1-3)	20.00
Ventilating feelings	2	2-10	2-10	4 (2-6)	40.00
Relaxation	1	1-5	1-5	3.37 ±1.41	67.40 ± 28.20
Seeking Spiritual support	1	1-5	1-5	3.39 ± 1.50	67.80 ± 30.00
Acceptance	1	1-5	1-5	3 (1-4)	60.00
Wishful Thinking	1	1-5	1-5	3.39 ± 1.50	67.80 ± 30.00
Information Seeking	2	2-10	2-10	6.15 ± 2.50	61.50 ± 25.00
Seeking Diversion/ Distraction	10	10-50	10-40	25.21 ± 5.81	50.42 ± 11.62
Social support	4	20	4-20	11.21 ± 3.75	56.05 ± 18.75
Humor	1	5	1-5	1.89 ± 1.27	37.80 ± 25.4
Engaging in Demanding Activity	4	20	4-18	7.11 ± 3.14	35.55 ± 15.70
Professional Help	1	5	1-5	2 (1-4)	40.00
Total coping strategies	31	155	31-119	79.08 ± 16.17	51.01 ± 10.43

adolescent female of age 10-16 years was 63.57.[9] This study revealed that the major source for perceived stress regarding pubertal changes was due to physical changes. This is consistent with the finding of a study conducted in Australia which highlighted physical changes associated with puberty as a major source of stress in adolescent females.[6]

This study revealed that the adolescent school girls had used multiple coping strategies for resolution of perceived stress regarding pubertal changes like keeping feelings to themselves followed by seeking spiritual support, wishful thinking, relaxation, information seeking, acceptance, seeking social support , ventilating feelings and so on. Similar to this finding a study conducted in Australia showed that the adolescent school girls utilized multiple coping strategies like, ventilating feelings, seeking diversions, seeking social support, seeking family support, substance use, seeking spiritual support, investing in close friends, seeking professional support, engaging in exercise, being humorous.[6]

The present study revealed that there was positive correlation between age of the adolescent school girls and Perceived stress Score (r=0.132, p=0.001). This shows as age increases, perceived stress regarding pubertal changes also increases. Similar finding was observed in a study of Van Jaarsveld et al. which showed increased stress levels across all years from age 11years to age 15years i.e. mean perceived stress score increased from 5.8 to 7.1.[10]

The study findings showed that there was positive correlation between age of the adolescent school girls and coping strategies used by them (r= 0.108, p=0.007) which indicates that as age increases, use of coping strategies increases. The finding of the study is consistent with a study conducted by Krenke which showed that the use of active and internal coping styles increased across early and late adolescence.[11]

There was positive correlation between perceived stress and coping strategies and it was statistically significant (r= 0.454, p<0.001).

The finding is relevant to the finding of a study conducted by Glasscock et al. which showed that coping appears to be more strongly related to perceived stress among girls.[12]

In this study, the inclusion criteria were adolescent girls who were of 10-15 years and already had menarche. But adolescent girls aged 10-12years were not included as respondents who had menarche could not be found in this age group.

CONCLUSION

This study revealed that adolescent girls perceive stress regarding pubertal changes and to cope with this stress, they use multiple coping strategies like keeping feelings to themselves, seeking spiritual support, wishful thinking using relaxation techniques, seeking information etc.

An awareness program on developmental changes during adolescent period can be conducted to prepare adolescents for upcoming physical and psychological changes in them.

This study will be helpful for family members to understand their role to manage developmental stress among adolescents and will also be helpful to the adolescent friendly health services in planning the awareness program for adolescent population.

Table 4. **Association of perceived stress, its domains and coping strategies with socio-demographic variables**

Variables	Physical Changes		Social Comparisons		Family & Peers Relations		Cultural Events		Total Perceived Stress		Coping Strategies	
	Mean ±SD	p value	Mean±SD	p value	Mean±SD	p value	Mean±SD	p value	Mean±SD	p value	Mean±SD	p value
Religion												
Hindu	31.31± 9.13	0.898*	12.30 ± 4.73	0.621*	17.49 ± 5.63	0.354*	17.70 ± 7.54	0.001*	78.80 ± 20.14	0.481*	79.21± 16.22	0.687*
Kirat	32.26± 9.09		11.38 ± 3.82		16.60 ± 5.12		14.79 ± 6.97		75.02 ± 19.83		80.64 ± 17.20	
Buddhist	31.04± 9.38		12.20 ± 4.58		17.12 ± 6.16		17.22 ± 7.86		77.59 ± 23.24		77.20 ± 15.03	
Christian	30.89± 7.38		11.89 ± 3.74		17.38 ± 4.76		13.59 ± 5.77		73.76 ± 15.08		79.05 ± 15.94	
Muslim	34.20± 12.61		14.20 ± 5.76		22.00 ± 9.51		11.60 ± 3.57		82.00 ± 27.17		71.20 ± 18.26	
Ethnicity												
Dalit	31.20± 8.01	0.826*	12.23 ± 4.62	0.629*	18.46 ± 5.53	0.128*	19.00 ± 8.04	<0.001*	80.89 ± 19.05	0.605*	81.49 ± 15.18	0.325*
Disadvantaged Janajatis	31.42± 9.03		12.38 ± 4.53		17.43 ± 5.44		15.84 ± 6.93		77.07 ± 19.63		79.86 ± 15.07	
Disadvantaged not-dalit terai caste groups	30.08± 7.64		12.08 ± 5.03		18.27 ± 5.00		16.92 ± 7.04		77.35 ± 19.12		76.65 ± 11.49	
Religious minorities	34.20± 12.61		14.20 ± 5.76		22.00 ± 9.51		11.60 ± 3.57		82.00 ± 27.18		71.20 ± 18.26	
Relatively advantaged janajatis	31.97± 9.81		12.34 ± 4.85		17.68 ± 6.07		18.60 ± 7.55		80.59 ± 22.04		79.49 ± 16.91	
Upper caste groups	30.74± 8.84		11.62 ± 4.47		16.51 ± 5.55		18.93 ± 8.25		77.80 ± 19.89		76.79 ± 17.53	
Type of School studying in												
Government	31.98± 9.30	0.602**	13.41 ± 4.99	0.105**	18.28 ± 5.80	0.215**	19.19 ± 8.03	0.002**	82.86 ± 20.85	<0.001**	82.08 ± 15.28	0.005**
Private	31.12± 8.97		11.79 ± 4.39		17.12 ± 5.54		16.45 ± 7.18		76.48 ± 19.67		77.99 ± 16.36	
Grade of students												
Lower secondary	31.21± 8.71	0.614**	12.39 ± 4.58	0.218**	17.26 ± 5.71	0.311**	17.31 ± 7.65	0.557**	78.17 ± 20.12	0.993**	78.92 ± 16.62	0.752**
Secondary	31.59± 9.65		11.92 ± 4.66		17.73 ± 5.48		16.95 ± 7.26		78,19 ± 20.14		79.35 ± 15.39	
Awareness regarding pubertal changes												
Yes	31.51± 8.97	0.369**	12.16 ± 4.57	0.204**	17.39 ± 5.48	0.010**	17.11 ± 7.42	0.073**	78.18 ± 19.82	0.980**	79.21± 16.22	0.025**
No	29.58± 9.86		12.85 ± 5.02		17.79 ± 7.12		17.89 ± 8.47		78.11 ± 23.88		80.64 ± 17.20	

One way ANOVA Independent t-test*

ACKNOWLEDGEMENT

I would like to thank ethical review board of BPKIHS, Municipality office of Dharan, District Education Office, School principals for granting me permission to conduct this study. I also would like to thank my research advisors, Mr. Basant Kumar Karn and Ramanand Chaudhary for their support and at last all those adolescent girls who participated in this study.

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Graduates and Nursing Students' Viewpoints about the Bachelor in Nursing Science Program

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Citation

Singh R, Shrestha S, Chalise P. Graduates and Nursing Students' Viewpoints about the Bachelor in Nursing Science Program. *THE CLIFF.* 2018; 1: 56-61.

ABSTRACT

Background

Kathmandu University (KU) has a distinct Bachelor in Nursing Science (BNS) curriculum. The course is of a long duration and includes applied science courses as extra subjects with other subjects prescribed by Nepal nursing council. Both the inclusion of applied sciences and course durations are different in comparison to the same program in other universities of Nepal, due to which there are different arguments in the market and most of the candidates of BNS are not willing to join this program.

Graduate nurses and BNS students themselves represent the best means to elucidate whether the inclusion of applied sciences in the BNS curriculum and longer duration of the course are beneficial or not.

Objective

To explore the views of graduates and student nurses of BNS program of Kathmandu University about the duration of the program and inclusion of applied science courses in the curriculum.

Method

Descriptive cross sectional survey was conducted using both qualitative and quantitative methods among graduates and nursing students of BNS program of Kathmandu University. Quantitative data was collected from 61 graduates and 11 BNS students using self-administered questionnaires and data was analyzed by using descriptive statistics. Focus group discussion (FGD) was performed among 22 students into two groups and content analysis was done to explore the core opinion from them.

Result

An overwhelming majority of graduates and most of the BNS students believed that applied science courses are helpful to understand basic science courses and other nursing subjects clearly. However, few students believed that this applied science courses are extra burden and not necessary to study in nursing.

When asked about the duration of the program, the majority expressed that the four year course is better than the course which was less than four years because the latter is acceptable internationally and they do not need to study extra credit hours to be qualified to do further study abroad.

Conclusion

Identifying viewpoints of graduates and students helps to evaluate the program. The present findings confirm that inclusion of applied science courses in nursing curriculum are beneficial and are practically applicable in nursing practice. Regarding duration of the course, participants expressed that four years course is better.

KEY WORDS

Applied science courses, BNS curriculum, Course duration, Graduates, Viewpoints

INTRODUCTION

A pioneer educational system is a system able to evaluate and change its programs and operations according to the expectations and requirements of the society and of the students.[1] Ongoing evaluation of the program also provides the decision-makers with ideas to make necessary changes and hence, improve the program. The benefits of educational activities for the students, the expertise achieved during the education period, the role of educational activities in this achievement, and the educational life in training centers are the priorities of a modern educational approach.[1]

It is always advocated that nursing care should be based upon scientific concepts. Therefore, knowledge on concepts of science is desirable to help students understand better in human biology in health and illness. Nursing requires a holistic understanding of patient care, which includes bedside manner as well as science content, explicitly physics, chemistry and biology. For example nurses need to understand how to convert micro liters into milliliters so they do not administer an incorrect drug dosage to patients. Students also need to understand evolutionary processes in order to understand how bacteria can evolve into superbugs.[2] The best nurses are those that can incorporate the art and the science of nursing.[3]

Kathmandu University (KU) started Bachelor in Nursing Science (BNS) program in 2011 in its constituent program, i.e. Kathmandu University School of Medical Sciences (KUSMS) and later in 2012 it was started in two affiliated medical colleges, i.e. in College of Medical Science (COMS) Bharatpur and Nobel Medical College (NMC) Biratnagar. But due to some problems this program was discontinued after taking two bat ches in these two affiliated colleges. At present this BNS program is running in KUSMS only. Total graduates from KU at the time of data collection were 151 and the total number of current students was 33.

Initially, the course duration of BNS was 3 and a half years in KU 4, while the Bachelor in Nursing (BN) program in other universities was 2 years which was later extended to 3 years. Later in 2016, the BNS curriculum of KU was revised and the duration of program was extended to 4 years which includes the last year for a full internship.[5] Furthermore, there is inclusion of pure science subjects (Physics, Chemistry and Biology) in BNS curriculum while these subjects are not included in BN/BNS curriculum of other universities in Nepal. There is an ongoing debate both in favor and against the relatively longer course duration for BNS program in KU.

Hence, we conducted this opinion survey among graduates and students of BNS from KU about these issues. The main aim of this study was to explore the opinion of the BNS program particularly theinclusion of applied science courses and the duration of that program among graduates and students of BNS program from Kathmandu University. All respondents had an experience with applied science courses and had studied these courses at KUSMS.

METHODS

This was a descriptive cross sectional study conducted using both qualitative and quantitative methods. Data was collected from May to August 2017. Questionnaire was used to collect the viewpoints of graduates and students of BNS program of KU.

Quantitative data was collected from 72 participants by using self-administered questionnaire. At first information and contact address of graduates were collected from all three nursing schools where BNS program was conducted. All 151 graduates were approached via telephone and online communication (email and/or social networking sites), but only 61 of them participated in this study. Data was then collected from the BNS students from KUSMS in a group of 11 students using self-administered questionnaire. Data collected from online questionnaire were automatically saved in Google Spread sheet, which were downloaded upon completion of data collection. Necessary coding and classification of the data was done for further analysis. Quantitative data was analyzed by using descriptive statistics i.e. frequency and percentage distribution.

Open ended survey questionnaire were used for collecting qualitative data to explore the real viewpoints of the participants on the research questions. The questionnaire was developed on the basis of researchers' experience, literature review and discussion among the investigators with a view to meet the study objectives so that the respondents' opinion could be explored.

Focused Group Discussion (FGD) was performed with 22 BNS student volunteersof KUSMS to gain an in-depth analysis on the research questions into two groups. The reason to divide in two groups was to enable an effective interaction among the participants. The FGD ranged from 30 to 40 per session and was recorded with an audio recorder and later transcribed for further analysis. Content analysis by Graneheim and Lundman (2004) was done to explore the core opinions of the respondents.

Ethical permission for the study was taken from Institutional Review Committee of KUSMS and informed consent was taken from respondents prior to data collection.

RESULTS

1. Quantitative findings

For the quantitative part, there were a total 72 participants,out of which 61 were graduates and the remaining 11 studentswere of BNS program. Among the 61 graduates, 31 (43%) were from KUSMS, 16 (22.2%) from COMS, Bharatpur and 14 (19.5%) from NMC, Biratnagar.

Table 1. **Demographic information of the respondents. (n=72)**

Characteristics	Frequency	Percentage
Number of Graduates from different Colleges	61	84.7
Kathmandu University School of Medical Sciences	31	43.0
College of Medical Sciences, Bharatpur	16	22.2
Nobel Medical College, Biratnagar	14	19.5
BNS students (KUSMS)	**11**	**15.3**
First year	4	5.6
Third year	7	9.7
Current status of graduates		
Working/ studying abroad	13	21.3
Teaching	18	29.5
Clinical Nursing	27	44.3
Program Field Nurse	1	1.6
Looking for job	2	3.3

More than two fifth of the graduates (44.3%) were working as a clinical nurse within the country while nearly 30% were involved as nurse educators. It is to be noted that more than one fifth of the graduates were working or studying abroad.

Table 2 shows the responses of the participants to specific questions related to inclusion of applied science courses in BNS curriculum. Majority of the respondents, 62 (86.1%) expressed that applied science courses are helpful in BNS program, while 60 participants (83.3%) felt it was easier for them to understand concepts in nursing by relating with applied Science knowledge. Nevertheless, 23 participants (31.9%) felt that they had extra burden in BNS course due to pure science classes.

2. Qualitative findings

2.1 Viewpoints regarding inclusion of applied Science in BNS curriculum

The viewpoints regarding inclusion of applied Science in BNS curriculum fell into 3 categories:

a. Scientific reasoning

Participants expressed their viewpoint that having studied applied science courses had helped them to get a better understanding of concepts in nursing and basic science courses through scientific reasoning. They expressed that applied science courses are practically applicable in nursing practices. They believed that it is easier to understand certain nursing procedures by relating it with science and biological phenomenon.

b. Equivalent to internationally acceptable degree

Participants believed that having the science courses made their degree equivalent to an internationally acceptable one. This would help them in pursuing a nursing career or higher degrees abroad.

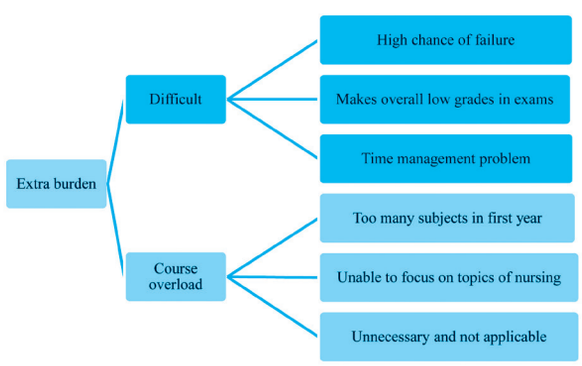
Table 2. **Respondents' opinion regarding inclusion of applied science course in BNS curriculum. (n=72)**

Questions	Responses	
	Yes	No
Do you think that applied Science courses are helpful in BNS program?	62 (86.1%)	10 (13.9%)
Do you think that it was easier to understand concepts in nursing by relating with applied Science knowledge?	60 (83.3%)	12 (16.7%)
Do you feel that you had extra burden in BNS course due to pure Science courses?	23 (31.9%)	49 (68.1%)

c. Extra burden

However, some of the participants also felt science courses as an extra burden in their nursing degree. Science courses were taken as tough subjects in which it was difficult to score good grades.

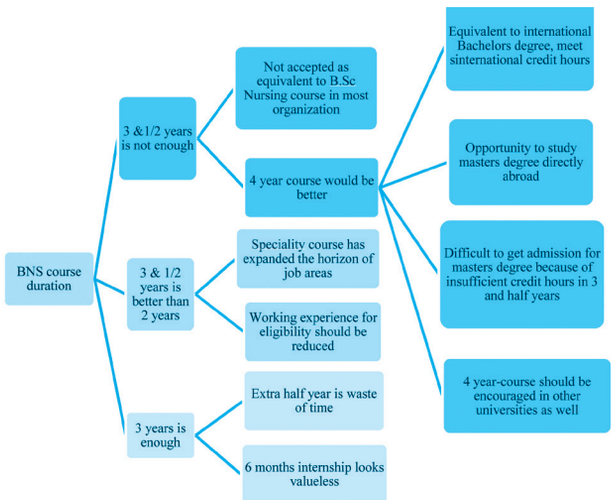
Having applied science courses was also perceived as course overload in the first year BNS. Too many new subjects in one academic year created confusion and made it difficult for them to focus on nursing subjects. Some of them even thought these science courses werenot necessary in nursing.



2.2 Viewpoints regarding duration of BNS course

The viewpoints regarding duration of BNS course fell into 3categories: 3 and half years duration not enough,3& 1/2 years is better than 2 years and 3 years is enough.

The first viewpoint we identified was that students felt the 3 and half years duration course was not enough, they would rather prefer 4 years course. They believed that 3 and half years course would not be considered as equivalent to 4 years B.Sc Nursing course. Also, they said they preferred 4 years course duration as it would make them easier to fulfill credit hours criteria for further studies abroad. Some participants also suggested that 4 years BNS course should be encouraged in other universities as well. However, some participants felt that 3 and half years course duration is good enough while some thought it to be a waste of an extra 6 months as 3 years course only could also have been enough.



Focus Group Discussion (FGD)

Findings emerged from the FGD data using content analysis method of qualitative data. There were mainly two questions:

1. What is your opinion on the inclusion of pure science subjects in BNS curriculum? What do you think,is it helpful or useless? Why?

2. The total duration of the BNS course has been increased to 4 years since 2016, while it was previously 3 and a half years. Also, the BNS program in other universities is still a 3 years course. What is your opinion in favor or against this extension? Please justify with reasons.

Participants' views are illustrated below with exemplar from their responses using pseudonyms for the participants.

Participants expressed their views mainly on three categories as the other respondents expressed in the self-administered questionnaire.

Majority of the respondents agreed that inclusion of applied science courses in BNS curriculum is helpful though these are tough subjects. Participants express this in the following statement:

Provides scientific reasoning:

"….We had studied about osmosis and diffusion in Biology. We could later relate those to how dialysis works by osmosis and diffusion." *(P 1, FGD 1)*

"…. Yes, because physics is applied in different areas of nursing like maintaining body mechanics, body posture etc. Likewise, Science is applied in topics like drugs and their chemical formula." (P 4, FGD 1)

"…. Yes, because everything we do in nursing care has a scientific rationale, with the help of applied science courses we can perform any nursing care with knowledge of a scientific rationale." (P 10, FGD 1)

"….I also think it is good to include applied science in BNS curriculum. I agree with participant 7 and 9, and 11, it has been easier for us to relate basic science course with applied science course." (P 12, FGD 2)

"…I think it is helpful, but I feel some of the practical classes in physics and biology are not important. (P 4, FGD 2)

Internationally acceptable:

"…. It is helpful because having science courses in the BNS curriculum adds extra credit for further studies abroad." (P 5, FGD 1)

"…. I think inclusion of applied science course in BNS curriculum is helpful because besides helping in scientific rationale it also helps for further study abroad and for carrier development." (P 2, FGD 2)

It is extra burden:

"….I also feel that it is extra burden for us. Every individual has his/her own interests. If I had interest in Science, I would enroll in Science Stream, but as I have interest in nursing, these science subjects have deviated my focus in nursing and have to focus in applied course to pass these science subjects." (P 3, FGD 1)

"….It is difficult for time management. There are 6 subjects in Integrated Health Science, plus, we have a vast pure science courses with little prior knowledge in science (up to SLC level). This has made it difficult for time management. So it is extra burden" (P 7, FGD 2)

"….I agree with Participant 10, Science courses are not burden. Only the important and necessary topics in theory class and necessary practical classes should be covered, so that we could increase our class hours for the basic health science courses. That would make it easier and better. (P 9, FGD 1)

Duration of the Course:

Most of the participants agreed on four years course duration is better than less than four years course.

"… after graduation we may wish to go abroad for further study or for work. If we studied 4 years Bachelor level course, we won't need to do any extra courses. Therefore, 4 years course is good. (P 2, FGD 2)

"… 4 years course is standard than 3 year course." (P 5, FGD 1)

"… If we complete 4 years course, it is useful wherever we go in the world. We won't have to do any extra courses." (P 12, FGD 2)

"… 4 years Bachelor course is recognize worldwide. We also want the same." (P 4, FGD 1)

"….I think it is better to have 4 years course duration. If it becomes equivalent to abroad (nursing) courses, 4 years course is better. After all, we will have to study again (if it is not of 4 years duration)." (P12,FGD 2)

DISCUSSION

Ability of understanding scientific reasoning, as mentioned by the participants in the study, was one of the advantages of having studied science courses in the BNS curriculum. According to Goudreau, Boyer and Letourneau, the current context of increasingly complex nursing care requires a high level of clinical reasoning in nursing practice.[6] In many clinical situations, there may be no clear guidelines and few or even no relevant clinical trials to guide decision-making. In these cases, the latest basic science about cellular and genomic functioning may be the most relevant science. Practitioners still have to learn how to discern generalizable scientific knowledge, know how to use scientific knowledge in practical situations.[7]

Experience and concerns about eligibility for pursuing Master degree course in nursing abroad were raised while discussing about the duration of the BNS course. While the Master's degree course in nursing in various universities within the country accept all kinds of Bachelors degree in nursing within the country for eligibility, the criteria for the same in foreign countries vary.[8-10]

According to Nursing and Midwifery Board of Australia for registration, *"Your qualification makes you eligible to apply for registration to practice as a registered nurse in the country where you completed the program of study" and "Your overseas qualification is equivalent to an Australian bachelor degree (registered nurse) as a minimum."*[11] Likewise, to be a registered nurse in USA, the criteria for foreigners include having graduated from an accredited Registered Nursing program, being a Registered Nurse (RN) and having practiced as an RN for at least two years. Additionally, to get license in the US, many states require nurses to complete a Foreign Educated Nurses (FEN) refresher course. The course consists of 120 hours in the classroom and 120 hours of clinical practice under the supervision of a licensed Registered Nurse.[12] Also, the announcement for Australia Awards Scholarship that provides the opportunity to gain an internationally recognized qualification from an Australian University states that a subject is eligible to apply for the award if he/she holds an equivalent of an Australian Bachelor's degree (either four years Bachelor's degree; or two/threeyears bachelor's degree with Master's degree) and also has at least three years of relevant professional experience pursued after Bachelor's degree (four years for applicants with two years Bachelor's degree).[13]

Some participants had a feeling of extra burden due to science courses. This could be because of time management problems for studying various subjects. A previous qualitative study on nursing students' time management mentioned that students felt dissatisfied with time management problems. Students did not seem to be able to do anything and avoid studying due to too much workload.[14] A study from Nigeria showed a significant relationship between time management and their academic performance in higher institutions.[15]

Regarding the duration of BNS course, there were mixed opinions with some favoring 3 years course duration, some favoring 3 and half years duration and some favoring 4 years course duration as being equivalent to international bachelor's degree. These varied opinions might be because there used to be a 2-year duration Bachelor in Nursing course under various universities in Nepal which was later changed to 3 years course in various universities. Therefore, some of them might favour 3 years and 3 and half years duration course. Additionally after introduction of 4-years duration B.Sc. Nursing courses in Nepal, comparison of BNS and B.Sc Nursing started in the health care market. Hence some of the students might be, therefore, preferring 4 years duration of the BNS degree. Furthermore as told by the graduated participants themselves, having a four years duration degree fulfills the credit hours for further education in foreign countries.

CONCLUSION

This study was done to explore the viewpoints of graduates and nursing students regarding BNS program. On the basis of above findings, we concluded that inclusion of applied science courses in the nursing curriculum is useful to understand the nursing and basic science subjects. Furthermore it helps to develop scientific reasoning while performing nursing practice and is practically applicable in nursing practice. Regarding the duration of the program, participants expressed mixed views.But majority of them expressed four years duration is better in order to be internationally acceptable.

Further studies should be investigated to assess the viewpoints of BNS students of other universities on the same topic which provides the decision makers with ideas to make necessary changes in the curriculum.

ACKNOWLEDGEMENT

We would like to acknowledge the Nursing Program Co-ordinator of Nobel Medical College, Biratnagar and Nursing Co-ordinator of College of Medical Sciences, Bharatpur for providing contact information of the BNS graduates from the respective colleges. We would also like to thank Mr. Kapil Thapa from IT department, Dhulikhel Hospital for helping us create the online questionnaire forms.

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THE CLIFF
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Author Guideline

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Authors Guidelines

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