

QUALITY OF LIFE OF THE PATIENTS TREATED WITH HEAD AND NECK CANCER: A CROSS SECTIONAL STUDY

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ABSTRACT

Cancer is one of the leading causes of death in Bangladesh where head and neck cancer is quite frequent among several types of cancer. Several researches already established that head and neck cancer creates significant impacts on an individual to perform the daily living activities. The purpose of the study is to identify the quality of life of the patients treated with head and neck cancer. A cross sectional study was conducted among 15 patients treated with head and neck cancer through Functional Assessment of Cancer Therapy- Head and Neck (FACT-H&N) questionnaire to identify various aspects of quality of life which includes physical, emotional, functional, and social well-being as well as specific additional concern that particularly focus on communication and swallowing. Data was collected through face to face interview of the participants who completed their treatment. Among the participants 93 % were male and 7% were female where maximum (40%) were 56-65 years old. Most of the participants (74%) diagnosed with laryngeal carcinoma where majority (53%) of the participants treated through radiotherapy. The study identified head and neck cancer and its treatment generates adverse impact on all aspects of quality of life where specifically 33% had significant swallowing and eating problem, 40% had considerable voice problem and overall 67% participants experienced different types of communication difficulty. The result suggest that inability of communication, voice problem, swallowing and eating difficulty act as catalyst which impact on physical, emotional, functional and social well-being of patients treated with head and neck cancer.

Keyword: - Head and Neck Cancer, Treatment of Head and Neck Cancer, Quality of life, and Additional Concern

1. INTRODUCTION

Cancer is one of the common causes of death around the world which occurs due to uncontrolled cell division and growth [23]. Cancer can origin in any part of the body, when it origins in the region of head and neck it is called head and neck cancer [8]. Cancers has different types where head and neck cancer is the sixth most common cancer around the world. Annually about 650,000 new cases of head and neck cancer are diagnosed where 350,000 deaths are occurred [2]. A study of World Health Organization (WHO) estimated that approximately 49,000 oral cancer and 71,000 laryngeal cancer cases in Bangladesh though the real scenario is unknown due lack of reporting system and under-diagnosis of the patients [25]. Most of the cancer patients are treated with surgery, radiation or chemotherapy or both [10]. After a prolonged several treatments of head and neck cancer, many anatomical and physiological changes occur which interferes individual's ability particularly in communication and swallowing [5]. According to Langendijk et al. (2008) head and neck cancer and its treatment can affect all aspects of quality of life such as physical, emotional, financial and social [11]. The study aimed to find out the real circumstances of the patients treated with head and neck cancer.

2. LITERATURE REVIEW

Cancer is one of the leading life threatening diseases around the world. Almost 22 million people suffering from cancer and approximately 10 million new cases are diagnosed each year around the world where more than 60% are diagnosed from developing countries. It is the third leading cause of death (about 3.8 million) in developing countries [16]. Worldwide 640,000 new people developed head and neck cancer in every year and 356,000 deaths occurred annually [9]. In terms of male female ratio of mortality an average 7.3 in males and 3.2 in females dies per 100,000 [20]. Specifically, head and neck cancer is frequent in Europe and almost 0.5 million new cases are diagnosed with it. In America, approximately 39,250 people developed head and neck cancer where 11,090 deaths occurred in 2006 [5]. Head and neck cancer is also very common in developing countries particularly in South and Southeast Asia where male are suffering more than female [9].

Cancer is also one of the major killer diseases in Bangladesh [23]. According to the Bangladesh Bureau of Statistics, cancer is the sixth leading cause of death. In Bangladesh, almost 1.3 to 1.5 million people suffering from cancer and about 0.2 million new cases are adding every year [26]. Among several cancer, the five most common cancers are head and neck, gynecological, lung, breast and esophageal in Bangladesh [7].

The most common treatment of head and neck cancer are radio therapy, chemotherapy and surgery. In radio therapy, high energy x-rays or other particles are use to kill cancer cells [3]. Systematic use of drugs through the bloodstream to kill targeting cancer cells throughout the body uses as a treatment of chemotherapy [1]. The surgical management is the treatment option of moving away of cancer cells from the body [2]. The choice of treatment depends on different factors of the patient which includes clinical stage, primary site and respectability of the carcinoma. Intervention of head and neck cancer involve destroying cancer cells but all they have a significant side effect [10]. The most common side effect in patients undergoing radiation therapy is xerostomia and secondary side effect is damage of the salivary glands [18]. Aremucositis, dysphagia, hoarseness, erythema, and desquamation of the skin are also seen frequently after radiation therapy [4]. The side effect of chemotherapy depends on the drugs that are used for the treatment. Some common side effect of chemotherapy is lower resistance of infection, sores in the mouth and lips, loss of appetite, nausea, vomiting, diarrhea, hearing loss etc. [6]. Side effect of surgery depends on the site and size of tumors and the section of cells from head and neck region. Laryngectomy is one of the common surgery can cause the problem in producing voice, decrease the ability to smell and taste [22].

All the side effects of the treatment of head and neck cancer can results poor quality of life particularly in physical, emotional, social and economical [12]. Nguyen et al. (2002) found that speech and swallowing problem are the main complain of the post treatment head and neck cancer patients [18]. Inability to communicate and swallow can result difficulty to maintain personal relationship, hinder work opportunity, increase economic insecurity as well as dependents to others [5]. Lin, Starmer and Gourin (2012) reported that patients treated with head and neck cancer experience the highest rate of depression which can result isolation from society and increase the risk of suicide [13].

3. METHOD

Patients who had cancer in head and neck region and completed their treatment were selected for the study from follow up of National Institute of Cancer Research and Hospital (NICRH). The study was conducted through face to face interview following a demographic information chart and a standard questionnaire. Patients' age, sex, education level, residence, occupation, anatomic site of cancer and treatment detail was included in demographic information chart. Physical, emotional, functional, social well-being and additional concern which was mainly related to eating, swallowing, voice and communication was included in FACT – H&N standard questionnaire. It is a measurement system and collection of health-related quality of life questionnaires that assess multidimensional health status of patients with head and neck cancer [14]. It was developed by Cella et al. in 1996 with comparison of general people and the patients of U.S. [24]. The FACT-H&NS consist of the FACT-G (general) and the H&NS. The FACT-G is a 27-item compilation of general questions divided into four primary quality of life domains: Physical Well-Being, Social/Family Well-Being, Emotional Well-Being, and Functional Well-Being. The H&NS is a 12 item compilation which mainly focuses on swallowing, voice and communication of patients with HNC. It assesses the effects of cancer and its treatment which include overall quality of life in the physical, emotional, social, and functional domains (FACT-G), as well as the impact of site-specific side effects (Head and Neck Specific Concerns). The reliability and validity of the questionnaire is confirmed by several studies [21]. A Bengali modified FACT-H&NS

questionnaires were presented to conduct direct interview to both male and female head and neck cancer patients who completed at least 4 weeks treatment including surgery, chemo and radiotherapy. Information of diagnosis and treatment was taken from history and medical records file of each patient.

4. RESULTS

The study was conducted to discover various aspects of quality of life specifically additional concern which may have some correlation on daily living. Investigators putted some demographic information in order to find out association of head and neck cancer with age, sex, education, residence, and financial back ground. Table-1 demonstrates that 93% of the participants were male and 7% were female. Regarding educational status, 13% were completed education at primary level, 33% completed at secondary level and 20% completed at higher secondary level where 27% participants were illiterate. Majority of the participants (33%) were farmer and most of them (60%) were from rural area.

Table-1: Demographic characteristics of patients with head and neck cancer

Demography	Number	Percentage
Gender		
Male	14	93%
Female	1	7%
Education		
Illiterate	4	27%
Primary	3	13%
S.S.C	5	33%
H.S.C	3	20%
Graduate/Above	1	7%
Occupational Status		
Farmer	5	33%
Businessman	4	27%
Service	2	13%
Day Labor	2	13%
House Wife	1	7%
Retired/Aged	1	7%
Living Status		
Rural Area	9	60%
Urban Area	6	40%

Table-2 shows incidences of head and neck cancer increased noticeable after age 46 years and most prevalent in the age 56-65 years (40%). The lowest prevalent of the participants found between age 66-75 years and 76-85 years.

Table-2: Percentage of incidence of patients with head and neck cancer according to their age

Age (In year)	Number	Percentage
35-45	2	13%
46-55	5	33%
56-65	6	40%
66-75	1	7%
76-85	1	7%

Table-3 indicates that majority of participants (74%) had carcinoma of larynx. Separately 13% had carcinoma of tongue and 13% had carcinoma of buccal mucosa.

Table-3: System wise distribution of head and neck cancer

Site	Number	Percentage
Larynx	11	74%
Carcinoma of Tongue	2	13%
Buccal Mucosa	2	13%

In table-4, medical report obtained that most of the participants (53%) were treated only by radiotherapy where 27% participants were treated with the combination of chemotherapy and radiotherapy and 20% were treated with surgery and radiotherapy.

Table-4: Treatment pattern of patients with head and neck cancer

Nature of treatment	Number	Percentage
Radiotherapy	8	53%
Chemotherapy and Radiotherapy	4	27%
Surgery and Radiotherapy	3	20%

In physical wellbeing subscale chart-1, there was a moderate growth of lack of energy level from little bit to very much which ranged between 7% and 33% respectively. Among the participants 47% had somewhat nausea. Majority of the participants (73%) answered that they had very much trouble of meeting the needs of their family because of their physical condition. Almost every participant experienced pain at different level where most of them (40%) had quite a little pain into their body though 20% experienced no pain. In terms of side effect of the treatment of head and neck cancer 47% participants were very much bothered where 40% were quite a bite bothered. Majority of the participants (86%) were not forced to spend time in bed and.

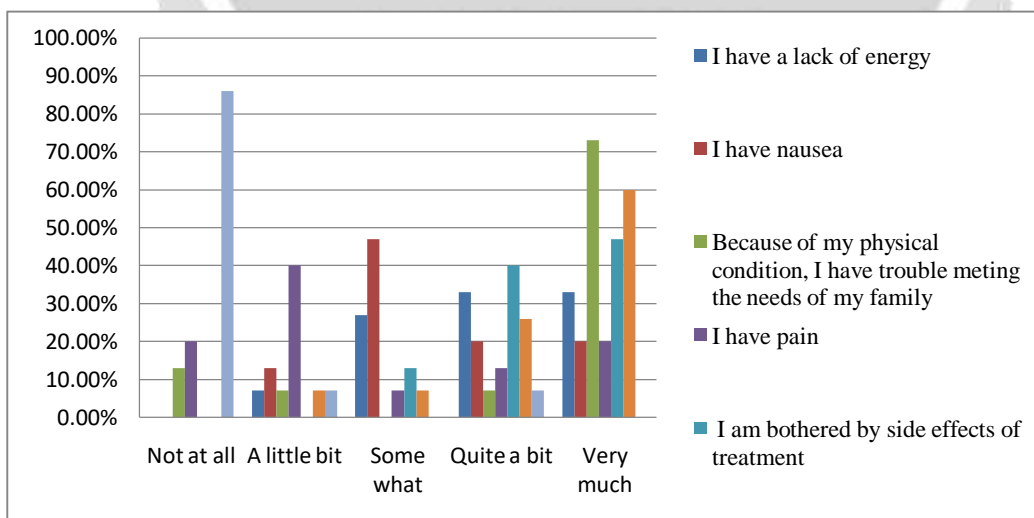


Chart- 1: Physical Well-being of the Participants

Chart-2 represents that 40% of the participants had somewhat relation where no one had strong relation with their friends. Majority of the participants (46%) were getting significant emotional support from their family where 40% were getting somewhat support from friends. In case of family acceptance of illness most of them were accepted by family ranged between quite a bit 40% and very much 40%. It was observed that 46% of the participants were very satisfied with family communication about their illness where 67% were very close to their partner.

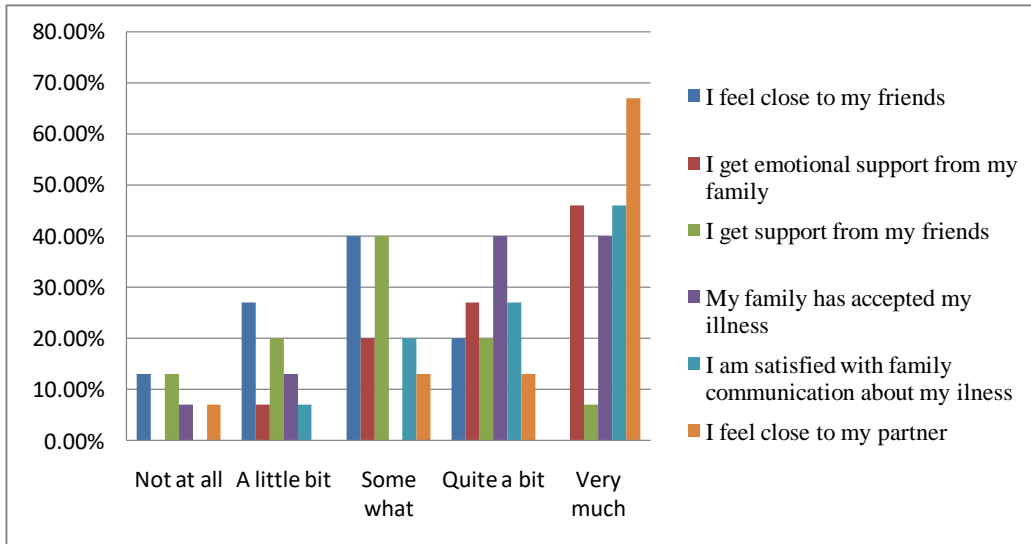


Chart-2: Social/family Well-being of the Participants

Chart-3 obtained that most of the participants (86%) were very much sad for their current status where 33% were not satisfied at all in case of coping with their illness. Majority of the participants (60%) were severely losing hope in the fight against of their illness. 73% of the participants were some-what nervous where 86% were extremely worried about dying. Highest number (93%) of the participants reported that they are very much worried about their condition will get worse.

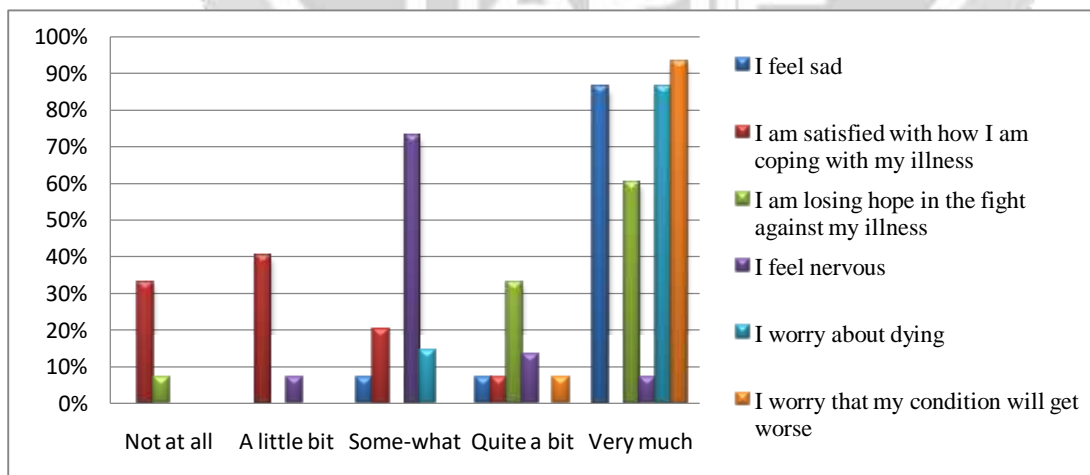


Chart-3: Emotional Well-being of the Participants

In functional well-being chart-4, 53% participants were able to work a little bit where 33% were unable to work at all. It is observed that 33% of the participants reported that their work is fulfilling a little bit. Most of the participants (60%) responded that they are not able enjoy their life. Among the participants 73% had not accepted their illness where only 7% accepted their illness. Most of the participants (53%) were not enjoying at all the things they usually do for fun. In terms of the perception of the participants (47%) were not content with present quality of life at all where 40% participants were little bit content with their present quality of life.

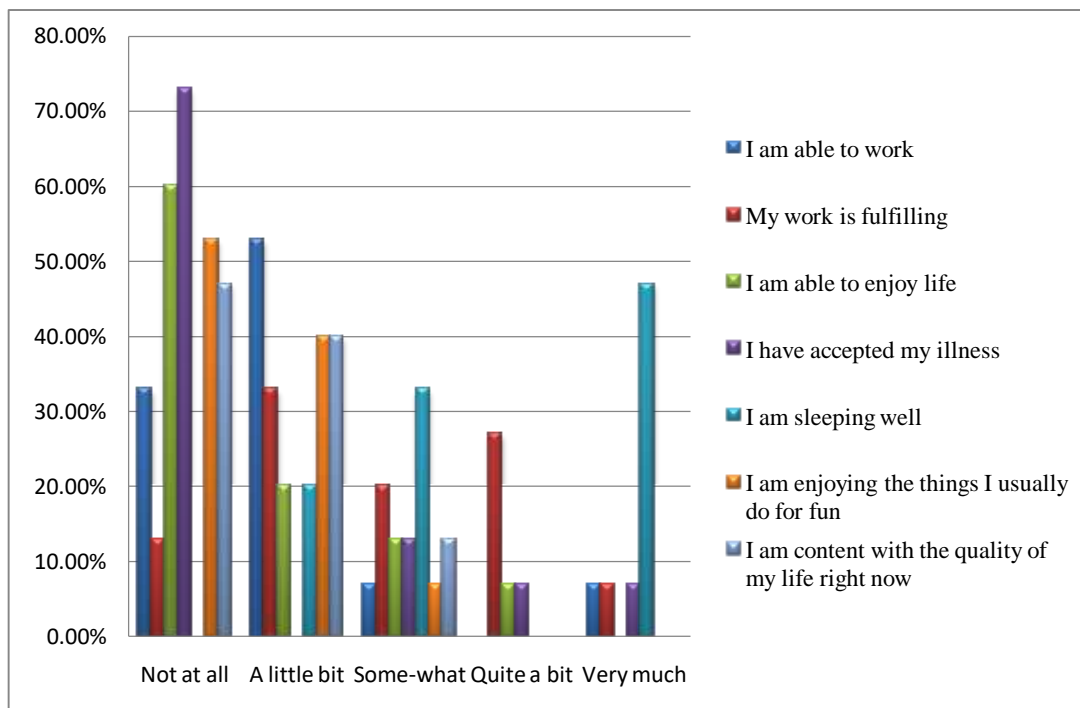


Chart- 4: Functional Well-being of the Participants

Table-5 represents additional concern where 33% participants reported that they are a little bit able to eat the foods that they like and 20% were unable to eat at all. Majority of the participant (40%) experienced severe dry mouth though 33% mentioned they didn't have trouble in breathing at all. The table shows that several (40%) participants didn't have their usual voice quality and strength in the mean time only 7% mentioned they had their actual voice similar as previous. In terms of food intake 47% participants reported that they were unable to eat as much food as they need at all. 40% participants reported that they were very much unhappy with how their face and neck look. A mixed result found in swallowing where 20 % totally unable to swallow naturally and easily, 33% a little bit, 7% somewhat, 27% quite a bit and only 13% were very much able. 60% participants were not smoking or other tobacco products where no one found who drink alcohol. In case of communicating with others a varied response found where only 7% mentioned they were unable to communicate at all, 27% a little bit, 33% somewhat, 20% quite a bit and 13% had no problem to communicate with others. Among the participants, 27% answered they were unable to eat solid foods at all where 40% represented a little bit ability, 13% somewhat, 7% quite a bit and 13% had no problem at all. The table also demonstrated that 33% participants had severe pain in their mouth, throat or neck, 7% had quite a bit, 20% had somewhat, 27% had a little bit and only 13% of the participants had no pain.

Table- 5: Additional Concern of the Participants

Additional Concern	Not at all	A little bit	Some what	Quite a bit	Very much
I am able to eat the foods that I like	20.00%	33.00%	7.00%	13.00%	27.00%
My mouth is dry	7.00%	13.00%	27.00%	13.00%	40.00%
I have trouble breathing	33.00%	27.00%	20.00%	7.00%	13.00%
My voice has its usual quality and strength	40.00%	27.00%	13.00%	13.00%	7.00%
I am able to eat as much food as I want	47.00%	20.00%	13.00%	7.00%	13.00%
I am unhappy with how my face and neck look	0.00%	27.00%	13.00%	20.00%	40.00%
I can swallow naturally and easily	20.00%	33.00%	7.00%	27.00%	13.00%
I smoke cigarettes or other tobacco products	60.00%	27.00%	13.00%	0.00%	0.00%
I drink alcohol	100.00%	0.00%	0.00%	0.00%	0.00%
I am able to communicate with others	7.00%	27.00%	33.00%	20.00%	13.00%
I can eat solid foods	27.00%	40.00%	13.00%	7.00%	13.00%
I have pain in my mouth, throat or neck	13.00%	27.00%	20.00%	7.00%	33.00%

5. DISCUSSION

The study was conducted among 15 participants where 93% were male and 7% were female which indicate that head neck cancer is very common among male than female [9]. Ragin, Modugno and Gollin (2007) revealed that an average incidence rate of head and neck cancer 8.8 in males and 5.1 in females per 100,000 respectively which also indicate that head and neck cancer is very common among male than female [20]. In this study incidences of head and neck cancer increased noticeable after age 46 years and most prevalent in the age 56-65 years (40%) which represent cancer has a close correlation with age [7]. Investigators found most of the participants had carcinoma of larynx (73%) which evident laryngeal carcinoma is frequent among several types of head and neck cancer [16]. According to Dirix, Nuyts and Bogart (2006) radiotherapy is the main treatment of head and neck cancer [4]. In this study, radiotherapy found as a common and main treatment of all the participants where the highest numbers of the participants (53%) were treated only by radiotherapy, 27% participants were treated with both chemo and radiotherapy and 20% participants were treated with surgery and radiotherapy.

Results of physical well-being sub-scale suggest that participants treated with head and neck cancer experience a range of common problems. The study obtains that majority of the participants experienced pain at different level whereas most of them (40%) said about moderate pain in their mouth and throat. Similar result found in a study conducted in Nigeria where researchers revealed that pain is commonly reported in head and neck cancer patients, and has a significant impact on their quality of life [19]. The study shows that the highest numbers (47%) of the participants were very much bothered by the side effect of treatment of head and neck cancer. Comparable result found from a study that was conducted among 58 participants with head and neck cancer which indicate that the participants were most bothered physically by side effects at the end of treatment [21].

Combination of both family and friends' support are essential to ensure decent quality of life of an individual. Lack of support either from family or friends, could represent poor quality of life. A mixed result is noticeable in this study where majorities of the participants (40%) were not so closed and did not get enough support from their friends. But in terms of relation with life partner majority of the participants (67%) were very much satisfied and (46%) were getting excellent mental support from their family. This result reflects strong family bonding into the community of Bangladesh. But lack of social contact with friends may isolate individual from the society [3].

As mental issue is an aspect of health, therefore poor mental issues represent poor health as well as poor quality of life. Emotional well-being sub-scale obtain that 86% of the participants were very much sad for their current status where 33% were not satisfied at all in case of coping with their illness. Majority of the participants (60%) were severely losing hope in the fight against of their illness. Significant numbers (86%) of participants were extremely worried about dying where highest number (93%) of the participants reported that they are very much worried about their condition will get worse. These results exactly signify adverse impact of treatment of head and neck cancer which results poor quality of life.

The study infers that the majority of the participants (60%) were unable to enjoy their life where 73% did not accept their illness and they think they were not content with the quality of life. Common problems on functional subscale found most of the participants (53%) reduced their work ability a little bit where 33% were unable to work at all. These results demonstrate that people treated with head and neck cancer reduced their functional ability that is a consequence of poor quality of life on functional well-being.

Nguyen et al. (2002) found that the main complain of people treated with head and neck cancer is speech and swallowing [18]. According to Myers (2005), head and neck cancer and its treatment interrupt at the most basic human functions such as the abilities to communicate, eating and social interaction [17]. This study obtained almost similar result where majority participants (33%) had severe problem of eating and swallowing food whereas 20% respond that they were unable to eat and swallow. Most of the participants (47%) were unable eat food according to their need where (40%) had very severe problem of eating solid foods. In terms of voice and communication, 40% participants believed that their voice does not have its usual quality and strength where most of the participants (33%) were some-what able to communicate with others. Mallis et al. (2011) conducted a study on 92 patients with head and neck cancer in Greece where the majority of patients reported difficulties communicating with strangers (56.5%) or via telephone (78.3%). They also found swallowing and eating disorders were also reported by a significant percentage of patients 15.2% and 13% respectively [15]. This study similarly indicates swallowing and communication difficulty is significant among patients treated with HNC.

6. CONCLUSIONS

Quality of life is an objective measure that shows an individual's appearance including physical, emotional, functional and social status into the community. Majority of the patients mentioned pain in mouth and throat, dryness of mouth, loss of energy, inability to work, less social interaction and hopeless and worry as a result of side effect of head and neck cancer treatment. Voice problem, communication difficulty, swallowing and eating difficulty was the principal additional concern identified from the patients that hampering quality of life of an individual treated with head and neck cancer. Because of limited number of sample the findings of the study did not represent the whole population. In this context, it can be a baseline document for further insight study on people treated with head and neck cancer.

7. REFERENCES

- [1]. Adeyemi, B. F., Adekunle, L. V., Kolude, B.M., Akang E.E.E., and Lawoyin, (2008). Head and neck cancer: a clinicopathological study in a tertiary center. [Online] *Journal of the National Medical Association*, 100(6), 690-697. Available from <http://www.nmanet.org>. [Accessed: 15th August 2014]
- [2]. Cognetti, D. M., Weber, R. S., & Lai, S. Y. (2008). Head and neck cancer: an evolving treatment paradigm. [Online] *Cancer*, 113(7), 1911–32. Available from: <http://www.interscience.wiley.com>. [Accessed: 15th August 2014]

- [3]. Curran, D., Giralt, J., Harari, P. M., Ang, K. K., Cohen, R. B., Kies, M. S., Jassem, J., Baselga, J., Rowinsky, E. K., Amellal, N., Comte, S., & Bonner, J. A. (2007). Quality of life in head and neck cancer patients after treatment with high-dose radiotherapy alone or in combination with cetuximab. *Journal of Clinical Oncology*, 25, 2191-2197. Retrieved from <http://jco.ascopubs.org>
- [4]. Dirix, P., Nuyts, S., & Bogaert, W. V. (2006). Radiation-induced xerostomia in patients with head and neck cancer: a literature review. *Cancer*, 107, 2525-34. Retrieved from <http://www.interscience.wiley.com>
- [5]. Enderby, P., Pickstone, C., John, C., Fryer, K., Cantrell, A., & Papaioannou, D. (2009). *Royal College of Speech and Language Therapists*. Retrieved from http://http://www.rcslt.org/speech_and_language_therapy/commissioning/head_and_neck_cancer_plus_intro
- [6]. Goon, P. K.C., Stanley, M. A., Ebmeyer, J., Steinstrasser, L., Upile, T., Jerjes, W., Sprekelsen, M. B., Gerner, M., & Sudhoff, H. H. (2009). HPV and head and neck cancer: a descriptive update. *Head & Neck Oncology*, 36 (1), 1-8. Retrieved from <http://www.headandneckoncology.org/pdf/>
- [7]. Hasan, N., Uddin, M. M., Rfiquzzaman, M., Chowdhury, S. S., & Wahed, T. B. (2012). Distribution of types of cancer and patterns of cancer treatment among the patients at various hospitals in Dhaka division, Bangladesh. *International Research Journal of Pharmacy*, 3 (3), 219-222. Retrieved from <http://www.irjponline.com>
- [8]. Jarrell, B. E., Carabasi, R.A., & Radmoski, J. S. (2000). *Surgery* (4th ed.). USA: Lippincott Williams & Wilkins.
- [9]. Joshi, P., Dutta, S., Chaturvedi, P., & Nair, S. (2014). Head and neck cancers in developing countries. *Rambam Maimonides Medical Journal*, 5 (2), doi: 10.5041/RMMJ.10143 Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC4011474/>
- [10]. Kumar, P. & Clark, M. (2012). *Clinical medicine* (8th ed.). Spain: Saunders Elsevier.
- [11]. Langendijk, J. A., Doornaert, P., Leeuw, I. M. V., Leemans, C. R., Aaronson, N. K., & Slotman, B. J. (2008). Impact of late treatment-related toxicity on quality of life among patients with head and neck cancer treated with radiotherapy. *Journal of Clinical Oncology*, 26, 3770-3776. Retrieved from <http://jco.ascopubs.org>
- [12]. Lewin, J. S. (2005). Problem associated with alaryngeal speech development. In P. C. Doyle, & R. L. Keith (Eds.), *Contemporary consideration in the treatment and rehabilitation of head and neck cancer: voice, speech and swallowing* (pp. 593-623). USA: Pro-ed.
- [13]. Lin, B. M., Starmer, H. M., & Gourin, C. G. (2012). The relationship between depressive symptoms, quality of life, and swallowing function in head and neck cancer patients 1 year after definitive therapy. *Laryngoscope*, 122, 1518-1525. Retrieved from <http://hinariologin.research4life.org/>
- [14]. List, M. A.M., Antonio, L. L., Cella, D. F., Siston, A., Mumby, P., Haraf, D., & Vokes, E. (1996). The performance status scale for head and neck cancer patients and the functional assessment of cancer therapy-head and neck scale: a study of utility and validity. *Cancer*, 77, 2294-301. Retrieved from <http://hinariologin.research4life.org/>
- [15]. Mallis, A., Goumas, P. D., Mastronikolis, N. S., Panogeorgou, T., Stathas, T., Prodromaki, K., & Papadas, T. A. (2011). Factors influencing quality of life after total laryngectomy: a study of 92 patients. *European Review for Medical and Pharmacological Sciences*, 15 (8), 937-942. Retrieved from <http://www.europeanreview.org/wp-content/uploads/1016.pdf>.
- [16]. Mishra, A., & Meherotra, R. (2014) Head and neck Cancer: Global burden and regional trends in India. *Asian Pacific Journal of Cancer Prevention*, 15 (2), 537-550. Retrieved from http://www.apocpcontrol.org/paper_file/issue_abs/Volume15_No2
- [17]. Myers, C. (2005). Quality of life and head and neck cancer. In P. C. Doyle, & R. L. Keith (Eds.), *Contemporary consideration in the treatment and rehabilitation of head and neck cancer: voice, speech and swallowing* (pp. 697-736). USA: Pro-ed.
- [18]. Nguyen, N. P., Sallah, S., Karlsson, U., & Antoine, J. E., (2002). Combined chemotherapy and radiation therapy for head and neck malignancies: quality of life issues. *Cancer*, 94, 1131-41. Retrieved from <http://hinariologin.research4life.org/>
- [19]. Onakoya, P. A., Nwaorgu, O. G., Adenipekun, A. O., Aluko, A. A., & Ibekwe, T. S. (2006). Quality of life in patients with head and neck cancers. *Journal of the National Medical Association*, 98 (5), 765-770. Retrieved from <http://hinariologin.research4life.org/>
- [20]. Ragin, C. C. R., Modugno, F., & Gollin, S. M. (2007). The epidemiology and risk factors of head and neck Cancer: a focus on human papillomavirus. *Journal of Dental and Craniofacial Research* 6(2):104-114. Retrieved from http://www.oralcancerfoundation.org/hpv/pdf/HPV_Research_07
- [21]. Rose, P. M., and Yates, P. (2001). Quality of life experienced by patients receiving radiation treatment for cancers of the head and neck. *Cancer Nursing*, 24(4), 255-263. Retrieved from <http://eprints.qut.edu.au/>

- [22]. Schuster, M., Lohscheller, J., Hoppe, U., Kummer, P., Eysholdt, U., & Rosanowski, F. (2004). Voice handicap of laryngectomees with tracheoesophageal speech. *Folia Phoniatr Logop*, 56 (1), 62–67. doi: 10.1159/000075329. Retrieved from <http://hinarilogin.research4life.org/uniqueidwww.karger.com/uniqueid/Article/Pdf>
- [23]. Talukder, M. H., Jabeen, S., Islam, M. J., Karim, N., Shaheen, S., Mamun, A. A., Alam, S., Baki, M. O., & Zaman M. (2009). *Cancer Registry Report of the NICRH, 2005-2007*. Retrieved from <http://www.ban.searo.who.int/LinkFiles/>
- [24]. Webster, K., Cella, D., & Yost, K. (2003). The Functional Assessment of Chronic Illness Therapy (FACIT) Measurement System: properties, applications, and interpretation. *Health and Quality of Life Outcomes*, 79 (1), doi: 10.1186/1477-7525-1-79. Retrieved from <http://www.hqlo.com/content/1/1/79>
- [25]. Zaman, M. M. (2009, February 14). Tobacco and cancer situation in Bangladesh. *The Daily Star*. Retrieved from http://archive.thedailystar.net/newDesign/print_news
- [26]. Hussain, S. A., & Sullivan, R. (2013). Cancer control in Bangladesh. *Japanese Journal of Clinical Oncology*, 43(12), 1159–1169. Retrieved from <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3842101/pdf/hyt140.pdf>

