

Review Article

A Review on Health and Nutrition Status in Bangladesh: Issues and Challenges

Md. Monirul Islam^{1,*}, Md. Ibrahim², Israt Jahan Ira³, Md. Abu Torab², Md. Zakir Hossen²,
Zobayer Hossain²

¹Department of Pharmacy, State University of Bangladesh, Dhaka, Bangladesh

²Department of Pharmacy, Atish Dipankar University of Science and Technology, Dhaka, Bangladesh

³Department of Pharmacy, Mawlana Bhashani Science and Technology University, Tangail, Bangladesh

Email address:

amin.pharma07@gmail.com (Md. M. Islam)

*Corresponding author

To cite this article:

Md. Monirul Islam, Md. Ibrahim, Israt Jahan Ira, Md. Abu Torab, Md. Zakir Hossen, Zobayer Hossain. A Review on Health and Nutrition Status in Bangladesh: Issues and Challenges. *International Journal of Biomedical Engineering and Clinical Science*.

Vol. 4, No. 2, 2018, pp. 48-53. doi: 10.11648/j.ijbecs.20180402.13

Received: March 8, 2018; Accepted: March 26, 2018; Published: May 4, 2018

Abstract: Health is a right, not privilege. It needs to be delivered with equity. National economic and social developments depend a lot on the state of health services. Bangladesh territory is one of the largest deltas of the world. It is a low lying country and has borders with India on three sides. The country is covered with a network of rivers and canals. Bangladesh mostly comprises floodplain areas, with scattered hills at the eastern and the northern parts. Bangladesh is recognized as the worst victim of global climate change effects. The country manifests all the direct and indirect effects of climate change, such as global warming and sea level rise. As a result, human health has to bear enormous costs. A large number of Bangladeshis, particularly in the rural areas have little access to healthcare facilities. This study was aimed to find out the major public health issues and challenges in Bangladesh. Bangladesh has one of the worst burdens of childhood malnutrition in the world. Communicable diseases are a major cause of death and disability in Bangladesh. Pneumonia and other infections are major causes of death among young children. Unsafe food remains a major threat to public health each year. Different non-communicable diseases — chronic diseases, cancer, diabetes, cardiovascular diseases, and chronic respiratory diseases — is increasing in Bangladesh as the population becomes more urbanized. The disease burden Bangladesh is further exacerbated by unsanitary living conditions that underscore the poor economic conditions of both urban and rural home dwellers. There are still several issues that Bangladesh health care system is yet to tackle and such issues are preventing the implementation of solutions to the public health issues in Bangladesh.

Keywords: Health, Malnutrition, Communicable Diseases, Non-Communicable Diseases

1. Introduction

Health is a human right that is central to happiness and well-being. It is obviously essential to development. Better health makes an important contribution to economic growth or progress, as it improves worker productivity, and income. Healthy individuals live longer, are more productive, and hence save more. Health is not only related to the good condition of the physical aspects of body, rather it also means being healthy in mind too. An unhealthy mind results in an

unhealthy body. Nice mental health offers a feeling of well-being. The roles of health issues in promoting human development have been extensively studied [1]. Actually, development is a complex process involving multiple interactions among different components. The World Health Organization's (WHO) work on 'Health and development' tries to make sense of these complex links. It is concerned with the impact of better health on development and conversely, with the impact of development policies on the achievement of health goals. Better health can improve an

individual's quality of life and his or her impact on others. There is an extensive literature on the importance of health as an indicator and also as an instrument of human [1]. WHO defines health as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity?" Good health promotes human development by allowing people to attend work regularly, and to work for more years. Better health can also alter the population growth rate in ways that promote development [2]. Moreover, good health can strengthen education, bad health can weaken it.

2. Relationships of Stigma and Shame to Health Issues

Stigma and shame are impediments to health. They are not new to public health. Stigma is a complicated issue that has deep roots in the convoluted domains of ethnicity, gender, class, race, sexuality, and culture. Stigma and shame are related but distinct constructs. Generally *Stigma* may be defined as an attribute or label that sets a person apart from others and links the labeled person to undesirable characteristics [3]. An additional implicit characteristic of stigma is that it represents socially shared knowledge understood even by the targets of the stigmatizing attitudes and behaviors [4]. Thus, shame can be an internalized reaction to stigma. *Shame* is defined as a negative emotion elicited when a person experiences failure in relation to personal or social standards, feels responsible for this failure, and believes that the failure reflects self-inadequacy rather than inappropriate behavior. The term "self-stigmatization" is sometimes used synonymously with shame to reflect a person's acceptance of the negative aspects of a stigma [5]. Shame is clearly distinguishable, however, from the related negative affect states of guilt and embarrassment [6]. History provides an unfortunate abundance of examples of "prejudice, discounting, discrediting, and discrimination" directed toward persons who are ill or perceived to be ill. For example, HIV/AIDS-related stigma is a complex concept that refers to prejudice, discounting, discrediting and discrimination directed at persons perceived to have AIDS or HIV, as well as their partners, friends, families and communities [4]. HIV/AIDS stigma often reinforces existing social inequalities based on gender, ethnicity, sexuality, race, class, and culture. HIV has compounded the stigma of homosexuality, drug use, poverty, sex work and racial minority status. HIV/AIDS stigma is a problem throughout the world. Stigma has been expressed in a variety of ways, including: 1) ostracism, rejection and avoidance of people living with AIDS; 2) discrimination against people living with AIDS by their families, health care professionals, communities and governments; 3) mandatory HIV testing of individuals without prior informed consent or confidentiality protections; 4) quarantine of persons who are HIV infected; and 5) violence against persons who are perceived to have AIDS, be infected with HIV or belong to "high risk groups" [4]. HIV/AIDS stigma can also negatively affect the health and well-being of

HIV+ persons. HIV+ persons may not seek treatment or delay going to doctors due to real or perceived discrimination against them. A national study of HIV+ adults found that 36% reported experiencing discrimination by a health care provider, including 8% who had been refused medical service [7]. Some HIV+ persons don't have an adequate support network because they fear that friends or family will abandon them or suffer the same stigma they do. One study of Asian and Pacific Islanders (API) living with HIV found high levels of internalized stigma. APIs avoided seeking support because they were afraid of disclosure and saw themselves as unworthy of getting support [8]. Experiences of social rejection, disapproval and discrimination related to HIV may decrease the motivation of HIV+ persons to stay healthy. A study of HIV+ men and women found that those who had experienced stigma were also more likely to miss HIV clinic appointments and lapse in adherence to their medication. [9]

A former director of the World Health Organization (WHO) global program on AIDS, the late Jonathan Mann, identified three components of the HIV/ AIDS epidemic: "the epidemic of HIV, the epidemic of AIDS, and the epidemic of stigma, discrimination and denial". Since this statement was made in 1987, international efforts have largely focused on finding a cure for HIV/AIDS or preventing the transmission of HIV from high-risk groups, such as commercial sex workers or injection drug users (IDUs), to the general population [10]. However, the "epidemic of stigma, discrimination and denial" has received less attention and thus remains less understood. Stigma has been cited as undermining public health efforts designed to combat HIV/AIDS in several ways. It inhibits preventive behaviors, delays diagnosis, negatively influences care seeking behaviors, quality of care received, and the perception and treatment of people living with HIV/AIDS [10, 11]. The Joint United Nations Programme on HIV/AIDS (UNAIDS) frequently refers to the need to fight stigma, but this remains a challenging task especially because there is no consensus on the definition of stigma. The stigma research tradition stems from the seminal works of sociologist Goffman, *Stigma: Notes on the Management of Spoiled Identity*. Stigma research has traditionally focused on studying people with unusual conditions, such as facial disfigurement, mental illness, short stature, HIV/AIDS, and so on [12]. Most studies on HIV/AIDS-related stigma refer to Goffman's definition of stigma. He describes stigma as an "attribute that is deeply discrediting" and as one that reduces the affected person "from a whole and usual person to a tainted, discounted one". During the four decades since Goffman's classic work on stigma, the ever-widening range of this phenomenon has produced a massive body of literature that does not use a common definition or coherent theory of disease stigma [13]. In 2006, the Health & Society Scholars Working Group, which convened scholars across the social and health sciences, recommended bridging the traditions of stigma and prejudice research to deepen our understanding of stigma and the health implications of stigma and prejudice. Prejudice is defined as "an aversive or hostile attitude toward a person who belongs to a group, simply because he belongs to that group, and is

therefore presumed to have the objectionable qualities ascribed to the group". Even though stigma and prejudice have few conceptual differences, the bulk of the literature on stigma and prejudice are organized around a single disciplinary perspective, either stigma or prejudice, but rarely do they focus on both [12].

South and South-East Asia are now an epicentre of the HIV epidemic. Of all countries in this region, India is estimated to have the largest burden, with about 3.7 million infections [14]. Official Indian figures do not yet reveal such a scale of infection, but weaknesses in the serosurveillance system, bias in targeting groups for testing, and the lack of availability of testing services in several parts of the country suggest a significant element of underreporting. Even so, the available data are disturbing. In India, as elsewhere, AIDS is perceived as a disease of "others" – of people living on the margins of society, whose lifestyles are considered "perverted" and "sinful." Discrimination, stigmatization, and denial (DSD) are the expected outcomes of such values, affecting life in families, communities, workplaces, schools, and health care settings. Because of HIV/AIDS-related DSD, appropriate policies and models of good practice remain undeveloped. People living with HIV and AIDS (PLHA) continue to be burdened by poor care and inadequate services. Although there have been a small number of recent Indian studies on HIV/AIDS-related DSD, it remains the case that relatively little is known about the causes of these negative responses. As documented in the relatively few Indian studies of social responses to the epidemic thus far, social reactions to people with AIDS have been overwhelmingly negative. For example, 36 per cent of respondents in one study felt it would be better if infected individuals killed themselves; the same percentage believed that infected people deserved their fate [15]. Furthermore, in this same study, 34 per cent of respondents said they would not associate with people with AIDS, while about one-fifth stated that AIDS was a punishment from God. Negative responses and attitudes towards PLHA are strongly linked to general levels of knowledge about AIDS and HIV and, in particular, to the causes of AIDS and routes of HIV transmission. In most societies, AIDS is associated with groups whose social and sexual behaviour does not meet with public approval. In the study by *Pramanik et al.*, (2006), 60 per cent of respondents believed that "only gay men, prostitutes, and drug users can get AIDS. With these findings in mind, it is perhaps not surprising that virtually every Indian setting in which HIV-positive people interact with other people provides a backdrop for discrimination, stigmatization, and denial. Studies have documented HIV/AIDS related DSD in contexts such as the family, the community, the health care system, and the workplace. Discriminatory restrictions have also been reported in relation to travel, migration, insurance and health benefits. An Indian study found that, although a majority of those who had shared their HIV status with their families received care and support, it was largely men rather than women who qualified for such care. Forms of discrimination against women with HIV included being refused shelter; being denied a share of household property;

being denied access to treatment and care; and being blamed for a husband's HIV diagnosis, especially when the diagnosis was made soon after marriage [16]. Family responses to infected relatives are heavily influenced by community perceptions of the disease. Families that include an individual with HIV may fear isolation and ostracism within the community [17]. Consequently, they may try to conceal an HIV diagnosis, which in turn may cause considerable stress and depression within the family [16]. Because most people living with HIV/AIDS in India maintain such secrecy, the epidemic is not socially visible. Given this secrecy and invisibility, it would appear that there have been relatively few actual instances of community-based discriminatory responses. However, stigmatization and discrimination may arise when an individual identified as HIV-positive is seen as a source of infection to others, or when the physical appearance of someone with AIDS produces revulsion or fear. By contrast a person who is known to have HIV, but whose behaviour or appearance is "non-threatening," is sometimes tolerated and may even be offered support in the community. Nevertheless, misconceptions about how HIV is transmitted continue to fuel discrimination. The health care sector is perhaps the most conspicuous context for HIV/AIDS-related discrimination, stigmatization, and denial. Negative attitudes from health care staff generate anxiety and fear among PLHA. Consequently, many keep their serostatus secret, fearing still worse treatment from others. It is not surprising that among a majority of HIV-positive people, AIDS-related fear and anxiety, and at times denial of their HIV status, can be traced to traumatic experiences in health care settings. Globally, discrimination in these settings can be expressed in a variety of ways. The most commonly reported responses include a refusal to admit or treat HIV-positive patients [18], the tendency to neglect patients, the habit of testing for HIV without consent, and breaches of confidentiality [18]. A study of seven large Mumbai-based businesses revealed that none had a policy on AIDS and that mid-level management have adopted a "wait and see" attitude – waiting to see how many workers became infected and whether this had an impact on productivity. At the same time, anecdotal evidence of employment-related discrimination and stigmatization has begun to emerge. Individual cases of job loss, emotional isolation, and denial of employment on the basis of HIV status have been reported in the media, to NGO workers and social counselors, and to medical practitioners.

Stigma-reduction programs and trainings take place throughout the world. However, it is difficult to measure the effectiveness of programs. As a result, there stigma-reduction programs and trainings take place throughout the world. As a result, there are few published studies of effective stigma-reduction programs. Most programs use multiple components to address stigma including education, skills building and contact with HIV+ persons on individual and community-wide levels [19]. Many institutions have started programs against stigma. For example, The South Carolina HIV/AIDS Council (SCHAC) instituted an anti-stigma program with three components. First, SCHAC held

legislative town hall meetings focused on HIV issues within rural counties. Second, they produced an educational play on the realities of HIV stigma for communities and their local leaders. Third, SCHAC created a statewide marketing campaign to address HIV/AIDS stigma using public service announcements, posters and editorials. Besides, the New York State Department of Health AIDS Institute (AI) has used multi-level interventions to prevent HIV related stigma and discrimination. On a policy level, the AI has worked to pass laws and enact policies to protect the rights of HIV+ persons and persons perceived to be HIV+, including confidentiality laws and naming HIV/AIDS in the existing anti-discrimination law. They also provide forums and advisory councils for policy discussions, and set up an office for discrimination issues to handle complaints [20]. Therefore proper knowledge about HIV prevention, transmission and care can offset the stigma that is caused by ignorance. Education programs are still needed in many areas and populations, and will continue to be needed for successive generations of young people. Stigma exists not simply within individual actions, but within broad social and cultural contexts that need to be addressed in stigma-reduction programs. Organizations and communities must tackle the values, norms and moral judgments that contribute to the stigmatization of HIV+ persons by engaging faith-based organizations, key institutions and opinion leaders that help shape and reinforce societal values. Policymakers need to consider the potential consequences of laws to make sure they don't inadvertently increase HIV/AIDS-related stigma. Moreover, HIV/AIDS-related stigma is unlikely to go away any time soon. While research is being conducted nationally and internationally, more research is needed to measure the effects of stigma and understand what types of interventions work best for which communities. Promising stigma awareness and reduction programs need to be evaluated and published so that effective programs can be widely replicated [19, 20].

3. Health Issues and Challenges in Bangladesh

Bangladesh is one of the most densely populated countries in the world, having a population density of 1050 per km². Unsafe food remains a major threat to public health each year; citizens suffer from the acute effects of food contaminated by microbial pathogens, chemical substances and toxins. There is a need to minimize the consumer's exposure to unhygienic, contaminated and adulterated food and drinks through strict laws to control marketing of such products [21]. One such factor is violence against women. This is a widespread social problem that causes mental stress, physical suffering and even death, and is believed to be grossly underreported. One study reveals that in Bangladesh about 52% of men in both urban and rural sites reported ever physically assaulting female intimate partners [21].

The major communicable diseases in Bangladesh are

vaccine-preventable diseases (VPD), tuberculosis, malaria HIV/AIDS and neglected tropical diseases (Leprosy, Kala-azar, Lymphatic filariasis and dengue). However the disease burden in Bangladesh has shifted from communicable to non-communicable diseases (NCDs) like cardiovascular diseases, diabetes, cancer, and chronic respiratory diseases. [21]. In Bangladesh only 1% of the population is reported to be HIV-positive, but rates are much higher among high-risk populations: injecting drug users, sex workers, and men who have sex with men. Pneumonia and other infections are major causes of death among young children. Bangladesh still ranks among the top ten countries in the world with the highest TB burden. The disease is found primarily among the poor and least educated populations. Actually, communicable diseases are a major cause of death and disability in Bangladesh [22]. According to the World Health Organization, nearly 400 children die each day from acute respiratory infections (ARIs) in Bangladesh. Pneumonia is the leading cause of death worldwide in children under five years of age. Pneumonia, infection, and birth asphyxia are major causes of under-five deaths in the country. Early detection and treatment of infection is key to saving lives [23]. Malaria is common in some areas in northeast and southeast Bangladesh. In Bangladesh, malaria is highly endemic in 13 districts, from where more than 95% of the total malaria cases are reported. A total of 50,000 confirmed malaria cases are reported each year, but under-reporting is widespread. Prevention is key: sleeping under an insecticide-treated bed net every night and wearing long sleeved light colored clothing all help prevent mosquito bites. Malaria is a major public health problem in Bangladesh with 13.2 million people at risk [24]. Dengue is a mosquito-borne viral infection that causes flulike symptoms and occasionally develops into a potentially fatal infection. As opposed to malaria, dengue is carried in mosquitoes that are active during daylight hours. Approximately half of the world's population is at risk, largely in urban areas in tropical and sub-tropical regions, and global incidence has grown markedly in recent decades. There is no treatment for dengue, however early detection and access to medical care lowers fatality rates [21]. Neglected Tropical Disease; Such as Leishmaniasis (Kala-azar) is caused by a parasite transmitted by sand flies that often live in mud walls of homes. The disease is usually found among the poorest populations and is most prevalent in the northwestern part of the country. It is considered a major public health issue in country [21].

Although more than 90 million people in Bangladesh shifted to fixed-point defecation in the last five years, diarrheal diseases remain a leading cause of child and infant morbidity. A research study shows that only 1% of the population wash their hands with soap and water before having a meal, 0.7% before feeding children, and 30% after defecation [21]. The toll of non-communicable diseases (NCD) — chronic diseases, cancer, diabetes, cardiovascular diseases, and chronic respiratory diseases — is increasing in Bangladesh as the population becomes more urbanized. WHO report in 2002 identified unhealthy diet, physical inactivity, tobacco use, harmful use of alcohol, overweight, raised blood

pressure, raised total cholesterol levels and raised blood glucose as the most prevalent NCD risk factors among the world population (WHO, 2003). Cancer is the sixth leading cause of death in Bangladesh, accounting for more than 150,000 deaths annually [21]. Major non-communicable diseases include high blood pressure, diabetes, cancer and asthma. Cardiovascular (heart) disease is now considered to be a leading cause of death in Bangladesh [25]. About one in three women and about one in five men age 35 and older has elevated blood pressure and roughly one in ten women and men age 35 and older has elevated blood glucose, an indication of diabetes [26].

Table 1. Major Health Problems in Bangladesh.

Major Health Problems in Bangladesh	
Common Health Problems in Rural	Common Health Problems in Urban
Malnutrition	Hypertension
Worm Infestation	Air Pollution
Skin Infections	Sound Pollution
Diarrhoea	Heart Diseases
Acute Respiratory Infections	Diabetes
Anaemia	Cancer
Tuberculosis	Dengue Fever
Malaria	Drug Addiction
Leprosy	STD (Sexually Transmitted Diseases)
Poor Housing	Traffic Accidents
Poor Sanitation	Population Problem
Kala-Azar	Drug Addiction/Dependence Problem among the high risk group

Poor nutrition increased susceptibility to disease. In Bangladesh, close to 50% of children-under-five are stunted due to poor nutrition, with urban poor most affected. Although infant and child mortality is decreasing, poor nutrition is a critical health problem in Bangladesh [25]. About half of children aged 6-59 months suffer from anemia; four-in-ten are stunted; and one in three is underweight. Bangladesh has one of the worst burdens of childhood malnutrition in the world [27]. Besides, approximately 2 million people die every year due to diarrheal diseases, the most vulnerable of which are children under 5 years of age. The most affected are the populations in developing countries, living in extreme conditions of poverty, normally peri-urban dwellers or rural inhabitants. Sanitation generally refers to the toilets or latrines for safe disposal of human urine and feces. Inadequate sanitation is a major cause of disease worldwide [28]. Improving sanitation is a proven public health intervention at the household, community, and national levels. Although more than 90 million people in Bangladesh shifted to fixed-point defecation in the last five years, diarrheal diseases remain a leading cause of child and infant morbidity. Diarrheal disease is the second leading cause of death in children under five years old, and is responsible for killing around 760 000 children every year. Diarrhoea can last several days, and can leave the body without the water and salts that are necessary for survival. Most people who die from diarrhoea actually die from severe dehydration and fluid loss. Children who are malnourished or have impaired immunity as well as people living with HIV are most at risk of life-threatening diarrhea.

Measures to prevent childhood diarrheal episodes include: promoting exclusive breastfeeding, improving hygiene and sanitation, increasing access to improved sources of drinking water and sanitation facilities, zinc intake to ensure intestinal health, and hand washing with soap at critical times throughout the day [29].

4. Concluding Remarks

There are still several issues that Bangladesh health care system is yet to tackle; governance, accessibility, and affordability are key issues that are preventing the implementation of solutions to the public health issues in Bangladesh. ICDDR, WHO, and several other global organizations are making attempt to aid Bangladesh in resolving its health problems. Millions of people in the country are exposed to extremely high food and water-borne disease risks such as bacterial and protozoal diarrhea, Hepatitis A and E, and typhoid fever. The major public health issues and problems in Bangladesh include acute respiratory infections (ARIs) and pneumonia, dengue, diarrhea and water borne diseases, essential nutrition, HIV/AIDS, improved water, sanitation and hygiene (WASH), malaria, maternal, newborn and child health (MNCH), neglected tropical disease, non-communicable disease (NCDs), road safety, tuberculosis, vaccination and immunization. Poor nutrition, often called under-nutrition can damage physical, intellectual, and mental health, leading to reduced immunity, increased susceptibility to disease, impaired physical and mental development and reduced educational and economic productivity. Bangladesh has one of the worst burdens of childhood malnutrition in the world. Hence, improving nutrition should be a major public health priority in Bangladesh. Behavior change through hygiene promotion is also a priority to achieve the health benefit of sanitation coverage. Besides, ensuring optimal health for girls of reproductive age, improving the health and nutrition of mothers-to-be, and providing quality reproductive health services including ante- and post-natal care are pivotal to ensuring safe motherhood. Moreover, immunization is a proven tool for controlling and eliminating life-threatening infectious diseases. So, immunization makes a person is resistant to an infectious disease, typically by the administration of a vaccine. Therefore, these recommendations may play a great role in improving the standard of public health in Bangladesh.

References

- [1] Hannum E, Buchmann C. Global Educational Expansion and Socio-Economic Development: An Assessment of Findings from the Social Sciences. *World Development*, 2005; 33(3): 333–354.
- [2] Stark O, and M. R. Rosenzweig, eds. *Handbook of Population and Family Economics*. North Holland: Elsevier. 2006.
- [3] Fortenberry JD, McFarlane M, Bleakley A, Bull S, Fishbein M, Grimley DM, Malotte CK, Stoner BP. Relationships of Stigma and Shame to Gonorrhoea and HIV Screening. *American Journal of Public Health*, 2002; 92(3): 378-381.

- [4] Herek GM, Capitano JP, Widaman KF. HIV-related stigma and knowledge in the United States: prevalence and trends, 1991–1999. *American Journal of Public Health*, 2002; 92: 371–377.
- [5] Byrne P. Stigma of mental illness and ways of diminishing it. *Advances in Psychiatric Treatment*, 2000; 6: 65-72.
- [6] Anolli L, Pascucci P. Guilt and guilt-proneness, shame and shameproneness in Indian and Italian young adults. *Pers Individ Diff*. 2005; 39: 763–773.
- [7] Schuster MA, Collins R, Cunningham WE. Perceived discrimination in clinical care in a nationally representative sample of HIV-infected adults receiving health care. *Journal of General Internal Medicine*. 2005; 20: 807-813.
- [8] Kang E, Rapkin BD, Remien RH. Multiple dimensions of HIV stigma and psychological distress among Asians and Pacific Islanders living with HIV illness. *AIDS and Behavior*. 2005; 9: 145-154.
- [9] Vanable PA, Carey MP, Blair DC. Impact of HIV-related stigma on health behaviors and psychological adjustment among HIV-positive men and women. *AIDS and Behavior*. 2006; pp. 10.
- [10] Parker R, Aggleton P. HIV/AIDS-related stigma and discrimination: A conceptual framework and an agenda for action. Retrieved from www.popcouncil.org/pdfs/horizons/sdcncptlfrmwrk.pdf; 2002.
- [11] Bharat S, Aggleton P, Tyrer P. India: HIV and AIDS-related discrimination, stigmatization and denial. Retrieved from <http://www.hivpolicy.org/bib/HPP000715.htm>; 2001.
- [12] Stuber J, Meyer I, Link B. Stigma, Prejudice, discrimination and health. *Social Science and Medicine*, 2008; 67(3): 251-257.
- [13] Deacon H, Stepney I, Prosalendis S. Understanding HIV/AIDS stigma: A theoretical and methodological analysis. Pretoria, South Africa: Human Sciences Research Council. 2005.
- [14] UNAIDS. Report on the global HIV/AIDS epidemic. June. Geneva, UNAIDS. 2000.
- [15] Pramanik S, Chartier M, Koopman C. HIV/AIDS Stigma and Knowledge among Predominantly Middle-Class High School Students in New Delhi, India. *The Journal of Communicable Diseases*. 2006; 38(1):57-69
- [16] Garrido-Hernansaiz H, Heylen E, Bharat S, Ramakrishna J, Ekstrand ML. Stigmas, symptom severity and perceived social support predict quality of life for PLHIV in urban Indian context. *Health Qual Life Outcomes*. 2016; 14(1): 152.
- [17] Ssengonzi R. The plight of older persons as caregivers to people infected/affected by HIV/AIDS: evidence from Uganda. *Journal of Cross-Cultural Gerontology*, 2007; 22: 339-353.
- [18] OE A. HIV related stigmatizing attitude and practice among health care workers in Northern Nigeria. *Journal of Infectious Diseases and Immunity*, 2011; 3(13): 226-232.
- [19] Brown L, Macintyre K, Trujillo L. Interventions to reduce HIV/AIDS stigma: what have we learned? *AIDS Education and Prevention*. 2003; 15: 46-69.
- [20] Klein SJ, Karchner WD, O'Connell DA. Interventions to prevent HIV-related stigma and discrimination: findings and recommendations for public health practice. *Journal of Public Health Management and Practice*. 2003; 8: 44-53.
- [21] Muhammad F, Chowdhury M, Arifuzzaman M, Chowdhury A B M A. Public Health Problems in Bangladesh: Issues and challenges. *South East Asia Journal of Public Health*. 2016; 6(2): 11-16.
- [22] Elford J, Ibrahim F, Bukutu C, Anderson J. HIV-related discrimination reported by people living with HIV in London, UK. *AIDS and Behavior*. 2008; 12(2): 255-64.
- [23] World Health Organization. Bangladesh country data. <http://www.who.int/gho/countries/en/> (accessed Dec 2016)
- [24] Center for Disease Control and Prevention (CDC). Annual Report Book 2013. Atlanta: CDC, 2013.
- [25] National Institute of Population Research and Training. Bangladesh demographic and health survey. Dhaka: NIPORT, 2011.
- [26] World Health Organization (WHO), United Nations Children's Fund (UNPF). Joint monitoring Programme for water supply and sanitation, country file Bangladesh 2013 update. Dhaka: WHO & UNICEF, 2013.
- [27] World Health Organization (WHO). Diarrheal disease, Fact sheet. <http://www.who.int/mediacentre/factsheets/fs330/en/> (accessed Dec 2016).
- [28] World Health Organization (WHO). World Health Report 2002: Reducing risks, promoting healthy life. Geneva: WHO, 2003.
- [29] World Health Organization (WHO). Non-communicable disease risk factor survey. Dhaka: WHO, 2010.