**Assignment of Module two.**

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Course Code: D002

Course: Diploma in Water, Sanitation and Hygiene, (WASH).

Year: 2019

Month of Submission: 28 \_ Feb\_2019

Admission number: SN/206/11/2018

1. **Why is hand washing an essential aspect in WASH interventions?**

* Hand washing an essential aspect in WASH interventions because most of the diseases and conditions are spread by not washing hands with soap and clean, running water and below are the importances of hand washing according to Center for Disease Control and prevention CDC); Good hygiene is an important barrier to many infectious diseases, including the faecal–oral
* Diseases and it promotes better health and well-being. To achieve the greatest health benefits,
* improvements in hygiene should be made concurrently with improvements in the water supply and
* sanitation, and be integrated with other interventions, such as improving nutrition and increasing
* incomes. The next sections discuss how to improve personal and community hygiene practices
* that help to prevent the spread of faecal–oral diseases.
* Reduces the number of people who get sick with diarrhea by 23-40%
* Reduces diarrheal illness in people with weakened immune systems by 58%
* Reduces respiratory illnesses, like colds, in the general population by 16-21%
* Reduces absenteeism due to gastrointestinal illness in schoolchildren by 29-57%
* Hand washing with soap could protect about 1 out of every 3 young children who get sick with diarrhea and almost 1 out of 5 young children with respiratory infections like pneumonia
* Hand washing education and access to soap in schools can help improve attendance
* Good hand washing early in life may help improve child development in some settings
* Estimated global rates of hand washing after using the toilet are only 19%
* Hand washing helps battle the rise in antibiotic resistance
* Preventing sickness reduces the amount of antibiotics people use and the likelihood that antibiotic resistance will develop.
* Hand washing can also prevent people from getting sick with germs that are already resistant to antibiotics and that can be difficult to treat.
* Washing hands prevents illnesses and spread of infections to others.

1. **What are the main standards in WASH interventions in emergencies?**

**They are as follows;**

* Water quantity: Provision of facilities and services that increase the amount of water available for drinking, cooking and maintaining good hygiene practices within households, health care facilities or schools; and reduce the time and effort required to collect the water.
* Water quality: Improvement and protection of the microbiological (or chemical, such as arsenic) quality of drinking-water through water treatment and safe storage or by improving existing water sources to protect them from outside contamination. Improved water sources, as defined by the World Health Organization (WHO)/United Nations Children’s Fund (UNICEF) Joint Monitoring Programme for Water Supply and Sanitation (JMP) for the purposes of measuring progress towards the United Nations’ Millennium Development Goals (MDGs), include piped water on-site, public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater (WHO/UNICEF, 2015).
* Sanitation: Provision and use of facilities and services that safely dispose of human urine and faeces, thereby preventing contamination of the environment. Improved sanitation facilities as defined by the aforementioned JMP are those that hygienically separate human excreta from human contact and include flush or pour-flush toilets to piped sewer systems, septic tanks or pits, ventilated improved pit latrines, pit latrines with slab, and composting toilets (WHO/UNICEF, 2015).
* Hygiene: Practice of handwashing with soap after defecation and disposal of child faeces, prior to preparing and handling food, before eating, and, in health care facilities, before and after examining patients and conducting medical procedures. In this document, hygiene also refers to interventions such as food hygiene (safe food handling, including preparation, storage and serving) and environmental hygiene, such as safely disposing of household solid waste (Adams, Bartram & Chartier, 2008).
* According to International Initiative for Impact Evaluation, New Delhi, March, 2009, WASH interventions are classified into groups and sub-groups of related interventions (Fewtrell and Colford, 2004) which includes;
* Hygiene interventions: including hygiene and health education and the encouragement of specific behaviors, such as hand-washing.
* Sanitation interventions: providing improved means of excreta disposal, usually latrines.
* Water supply interventions: including provision of an improved water supply and/or distribution, such as the installation of a hand pump or household connection, either at the public or household level.
* Water quality interventions: water treatment for the removal of microbial contaminants and/or clean storage, either at the source or at the household level.
* Multiple interventions: those which introduced a combination of water and sanitation and/or hygiene elements to the study population.
* WASH intervention typically promotes both technologies(hardware) and regular use of the technology in the correct way (key behaviors)
* WASH technologies refer to the specific technologies, hardware, tools or devices that support consumption of safe drinking water, effective containment/deactivation of human faeces or improved handwashing practices. Specific examples include(WHO/UNICEF 2014)
* Household water treatment and storage(Centers for Disease Control 2014) including filter technologies, point-of- use water treatment with chemicals additives for example sodium hypochlorite-based water treatment systems, ultraviolet filtration devices, solar disinfection, boiling and modified or improved water storage containers.
* Sanitation; including improved latrine or toilets designs, ecological sanitation technologies, child potties, sani-pads (for infant feaces disposal.
* Handwashing hardware; including handwashing stations that include soap and clean running hand sanitizers and soapy water and
* Water supply; including specific hand pump technologies, small scale treatment and distribution systems, rainwater harvesting interventions, protected or improved wells and other technologies specifically designed to improve water availability or distribution at the community or household level

1. **Waste Management is becoming one problem in the emergencies. Why?**

According to HIF-Humanitarian Innovation fund, Waste Management refers to the collection, transportation, satisfactory storage, and disposal of wastes either liquid or solid wastes, as well as cleaning of streets and other public places

* Poor (SWM) - solid waste management, can pose serious risks to the health and safety of both the local popu­lation and people who work with waste. These risks include:
* Injuries and infection from direct contact with solid wastes: While all sharp items and chemicals may pose risks, there are particular concerns about contact with hazardous industrial wastes and pathogenic wastes from hospitals and clinics.
* Accidents and injuries: Waste collection and recycling workers face risks from traffic accidents and lifting injuries.
* Building rubble: This can be a physical danger because of partly collapsed buildings and unsafe surfaces.
* Contaminated air: Irritants and pathogens can be inhaled directly from fine-grained refuse material at open collection points and during waste transfer. Also, burning waste generates a large amount of smoke which can cause respiratory problems.
* Fire and explosion: Methane is generated as waste decomposes. This gas may support long-lasting fires in landfills, or seep into basements of surrounding buildings and reach potentially explosive levels. Piles of uncontained rubbish are a fire hazard.
* Spread of disease by vectors: Heaps of discarded wastes provide a breeding ground for flies and rats. These vectors can transmit disease and pathogenic micro-organisms from solid waste and excreta to the household. Concerns about the spread of pathogens are especially relevant in low-income countries where faecal matter is often present in solid waste. Water in tyres, old tin cans, or other containers encourages the breeding of mosquitoes, which also transmit diseases such as dengue, yellow fever, and malaria.
* Spread of disease by other animals: Foraging animals are likely to eat waste which may contain pathogens that are passed on when their meat is eaten.
* Diseases: Diseases that can spread through poor SWM include dysentery, viral and bacterial diarrhea, gastro-enteritis, typhoid, trachoma, plague, ty­phus, salmonella, leptospirosis, filariasis, malaria, tapeworm, and trichinosis.
* Scavenging: Poor people, especially in times of famine or food scarcity, may also be attracted to waste to hunt for food, leading to an increased risk of gastro-enteritis, dysentery and other diseases.
* Groundwater contamination: Groundwater can become contaminated by polluted water (i.e. leachate) from unsatisfactory disposal sites.

1. **Discuss how environmental health and sanitation affect the nutritional status of the vulnerable groups**

* The deaths resulting from under nutrition overshadow those caused worldwide by HIV AIDS, Malaria and Tuberculosis.
* According to the World Health Organization (WHO), at least50% of the combined under nutrition in children is associated with unsafe water, inadequate sanitation or insufficient hygiene.
* The lack of water and sanitation and the resulting diseases, i.e. repeated diarrhea or intestinal worm infections, often directly lead to a reduced nutritional status.
* These diseases negatively affect the body’s ability to take in nutrients from food and generally weaken the immune system. Children in developing countries are the most severely affected.
* In addition to these direct links between WASH and nutrition, there is a variety of more indirect implications. Without access to safe water close to home, people often have no choice but to drink water from unprotected sources. Time spent suffering from water-related diseases or collecting water reduces time for education, economic activities and good hygiene practices. Where safe water is available for purchase from vendors, high water prices often leave less money available for food and other necessities.
* Enteric pathogens can impair nutritional status even in the absence of symptoms such as diarrhea.
* Diarrhea is a leading cause of mortality and morbidity among children under 5 years of age. Although mortality from diarrhea in this age group has fallen steadily over the past decades from 1.5 million deaths in 1990 to 622 000 deaths in 2012, diarrhea morbidity has remained stable, with 1.7 billion cases occurring annually (Fischer Walker et al., 2012; Liu et al., 2012). Children under 5 years of age in low-income countries experience on average 2.9 episodes of diarrhea per year, with the highest incidence rates in the first 2 years of life – the critical window for a child’s development (Fischer Walker et al., 2012).
* Diarrhea and undernutrition form part of a vicious cycle. Diarrhea can impair nutritional status through loss of appetite, malabsorption of nutrients and increased metabolism (Caulfield et al., 2004; Petri et al., 2008; Dewey & Mayers, 2011). Frequent episodes of diarrhea in the first 2 years of life increase the risk of stunting and can impair cognitive development (Grantham-McGregor et al., 2007; Victora et al., 2008). At the same time, undernourished children have weakened immune systems, which make them more susceptible to enteric infections and lead to more severe and prolonged episodes of diarrhea (Caulfield et al., 2004).
* Soil-transmitted helminthes infections – roundworm, whipworm and hookworm – affect millions of people worldwide (WHO, 2013c). Soil-transmitted helminthes infections are directly caused by poor sanitation. Helminthes eggs and larvae can survive for months in the soil and can infect humans when ingested (e.g. via contaminated water or food), by contact with fomites or by direct contact with the skin when walking barefoot on contaminated soil (hookworm larvae).
* Soil-transmitted helminthes infections can affect nutritional status by causing malabsorption of nutrients, loss of appetite and increased blood loss. Heavy infections with whipworm and roundworm can impair growth (O’Lorcain & Holland, 2000). Hookworm infections are a major cause of anaemia in pregnant women and children. As many as one third of pregnant women in Africa are at risk of hookworm-related anaemia (Brooker, Hotez & Bundy, 2008), which in turn increases the risk of preterm delivery and low birth
* Children living in poor sanitary conditions are exposed to a high load of pathogens, especially between 6 months and 2 years of age, when they start crawling on the floor and putting objects into their mouths (Ngure et al., 2014). Chronic ingestion of pathogens can cause recurring inflammation and damage to the gut, leading to malabsorption of nutrients. This condition is often referred to as environmental enteropathy or environmental enteric dysfunction (Humphrey, 2009). Researchers suggest that environmental enteropathy may be an important cause of poor growth and may compromise the efficacy of nutritional interventions (Humphrey, 2009; Korpe & Petri, 2012). Several reviews highlighting the mounting evidence for links between unhygienic environments and gut dysfunction have recently been published (Humphrey,

1. **Assuming you have been appointed to head an organization dealing with health development in your area, describe the critical factors that you will consider in planning for health service in that area.**

According to Health Facilities Management Magazine (HFM), the following are the critical factors which should be considered in planning for health service in that area.

* Location
* Disease affected the area
* Size
* Personnel to carry out specific duties.
* Population of the area.
* Cost controls
* Speed to opening, an organization also may evaluate sites based on how quickly it would be able to complete the development and open its doors. Perhaps the organization wants to serve a new area quickly or perhaps it simply can’t wait any longer for the new or additional space.
* In addition, the organization should ensure that the site is free of any environmental concerns, such as wetlands, or remediation issues like underground storage tanks on the site of a former gas station. It can take a lot of time to manage these issues before a site is ready for development.

**REFERENCES**

* Water quality: Improvement and protection of the microbiological (or chemical, such as arsenic) quality of drinking-water through water treatment and safe storage or by improving existing water sources to protect them from outside contamination. Improved water sources, as defined by the World Health Organization (WHO)/United Nations Children’s Fund (UNICEF) Joint Monitoring Programme for Water Supply and Sanitation (JMP) for the purposes of measuring progress towards the United Nations’ Millennium Development Goals (MDGs), include piped water on-site, public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater (WHO/UNICEF, 2015).
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