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" Hand Hygiene: Proper handwashing techniques and use of hand sanitizers. "

اعداد الطالبة	
المرحلة	
الشعبة	
الدراسة	

Introduction:

Hand hygiene is a fundamental pillar in the prevention of infectious diseases and has been proven by numerous studies to be one of the most effective methods for reducing the transmission of pathogens, both in healthcare settings and in everyday life. Hands serve as a primary vehicle for transferring germs from one person to another or from contaminated surfaces to the body, making proper hand hygiene an essential practice at all times—not just during outbreaks or in medical facilities.

Global health organizations such as the World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) have placed great emphasis on hand hygiene practices, recognizing them as a core component of infection prevention strategies. Raising awareness among healthcare workers, educators, and the general public about the importance of hand hygiene has become a critical public health priority due to its direct impact on reducing disease transmission.

What makes this topic particularly important is the contrast between its simplicity and its powerful impact. Maintaining clean hands requires no complex equipment or advanced technology—just commitment and knowledge of when and how to perform it correctly. In the face of increasing global health challenges, promoting hand hygiene has become a vital preventive behavior and a shared responsibility for safeguarding public health.

Health Benefits of Handwashing

Handwashing is one of the simplest and most effective ways to prevent the spread of diseases and maintain overall health. It plays a vital role in reducing the transmission of germs and viruses that cause many serious illnesses, especially in environments where infections are common. Therefore, regular and proper handwashing is an essential health practice that benefits both individuals and communities.

- **Handwashing reduces the spread of infectious diseases such as influenza and COVID-19, which are transmitted through touch and airborne droplets.**
- **It prevents the transmission of bacteria and viruses that cause diarrhea by up to 48%.**
- **It helps reduce respiratory infections such as pneumonia, a leading cause of death among children under five years old.**
- **Handwashing can reduce child deaths related to diarrhea and pneumonia by up to 50%.**
- **Good hygiene promotes better growth in children, improving their overall health and development.**
- **It is an effective way to conserve clean water by reducing diarrhea episodes that require hydration treatment.**
- **Handwashing protects against contagious skin diseases like impetigo, which spreads through direct contact.**
- **Community awareness and promotion of handwashing in homes and schools significantly improve public health.**

Possible Side Effects of Handwashing

Despite its many benefits, excessive handwashing or using inappropriate products can cause some mild skin problems. It is important to be aware of these effects and how to manage them to maintain healthy skin while practicing good hygiene.

- **Frequent use of water, soap, or sanitizers can cause skin dryness.**
- **It may lead to skin irritation or cracking, especially when harsh soaps are used or when no moisturizer is applied afterward.**
- **Contact dermatitis is common among healthcare workers due to repeated exposure to water and cleaning agents, causing itching and skin peeling.**
- **Special care is needed, such as applying moisturizers after washing to prevent dryness and irritation.**
- **It is advisable to avoid scented soaps or those containing strong chemicals that may worsen skin irritation.**

Materials Used for Handwashing

Various materials are used to improve the effectiveness of handwashing by removing germs and contaminants from the skin. These materials differ in their nature and mode of action, but all aim to eliminate microorganisms while maintaining skin health. Below are the main materials used with a brief explanation of each:

- **Soap and Detergents:** **These are surfactants that break down the lipid bilayer membrane of microorganisms, destroying them. They also emulsify oils and dirt, allowing them to be rinsed away by running water, which enhances the removal of germs.**
- **Bar Soap:** **Bar soap is reusable but may carry bacteria from previous uses. However, studies show that the transfer of bacteria from contaminated bar soap is unlikely because bacteria are rinsed off with the lather. Still, health authorities recommend using liquid soap with no-touch dispensers for better hygiene.**
- **Antibacterial Soap:** **Contains chemicals like triclosan that kill bacteria, but it may not be more effective than regular soap in removing germs. Additionally, antibacterial soaps may contribute to the development of antibiotic-resistant strains of microorganisms.**

- **Warm Water:** **Warm water helps remove natural oils that carry dirt and bacteria, but it is not hot enough to kill germs. Temperatures between 4°C and 40°C do not significantly impact microbial removal; thorough scrubbing is more important than water temperature.**
- **Sanitizers (Hand Rubs):** **Used when soap and water are not available, these usually contain at least 60% alcohol to kill germs. Hand sanitizers are effective against bacteria but may be less effective against certain viruses. Proper usage requires covering all parts of the hands and rubbing for about 30 seconds until dry.**
- **Sanitizing Wipes:** **A convenient alternative when traveling or when soap and water are unavailable. Sanitizing wipes should contain at least 60% alcohol to ensure effectiveness.**
- **Ash or Mud:** **Used as an alternative in low-income communities where soap is unaffordable. Ash can be effective at removing pathogens but the scientific evidence is limited, and contamination of ash or soil with microorganisms may increase disease transmission risks.**

Hand Sanitizers (Hand Disinfectants)

When washing hands with soap and water is not available—such as in public places without handwashing facilities—an alcohol-based hand sanitizer can be used as an effective alternative. It can also be used alongside handwashing to reduce the risk of infection transmission, especially when caring for "at-risk" groups.

Effectiveness and Usage Procedures According to German Standard DIN EN 1500

For a hand sanitizer to be effective, it must contain at least 60% alcohol (usually ethanol or isopropyl alcohol). A sufficient amount of sanitizer should be applied to cover the entire hands, rubbing the front and back of the hands, between the fingers, and fingertips for about 30 seconds until the sanitizer completely dries. It is important to ensure that all parts of the hands are thoroughly rubbed to guarantee comprehensive disinfection.

Components and Types of Hand Sanitizers

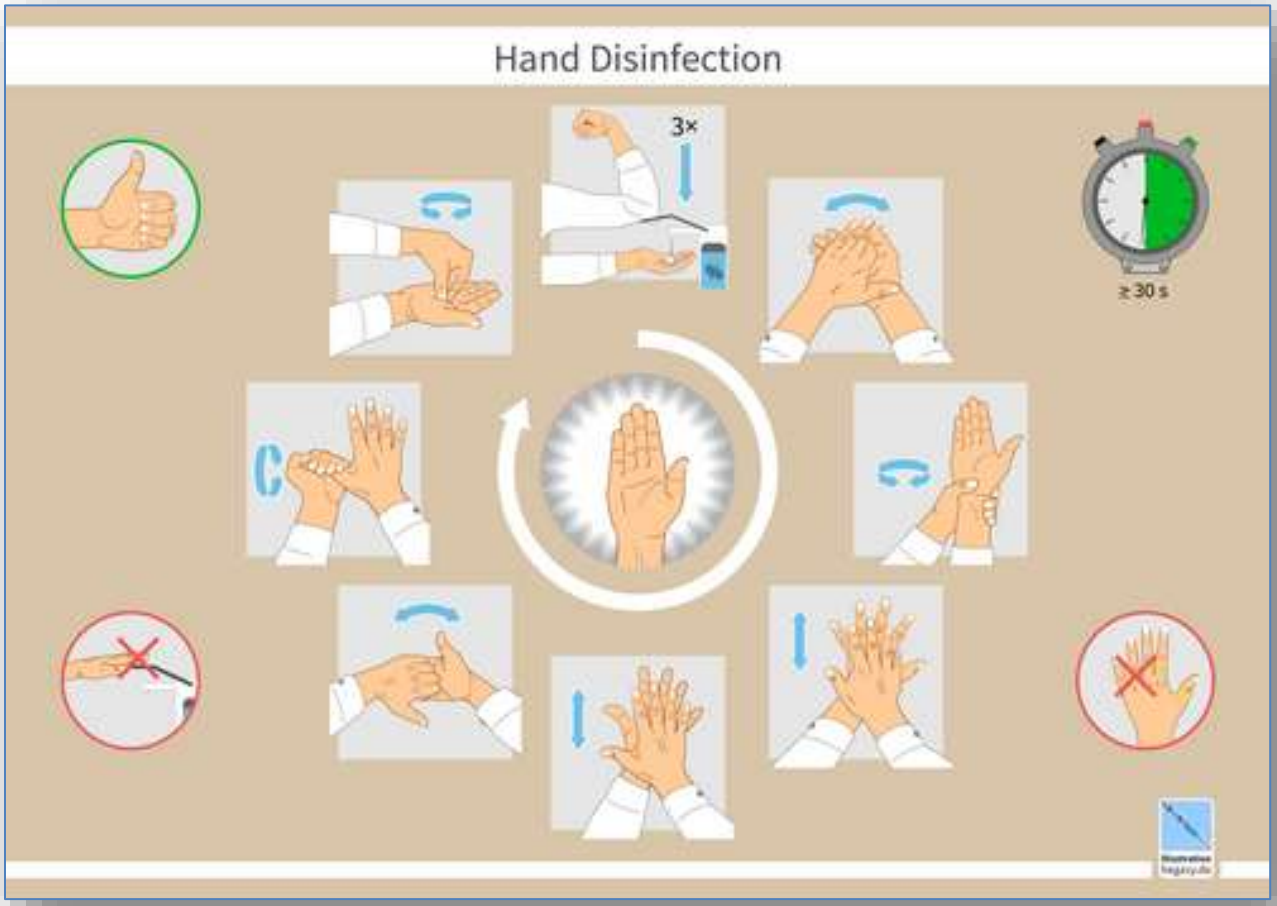
Hand sanitizers are waterless hand hygiene agents that began gaining popularity in the late 1990s and early 21st century. They typically consist of:

- **Isopropyl alcohol or ethanol as the antimicrobial agent.**
- **A thickening agent such as carbomer (acrylic acid polymer) to give a gel-like consistency.**
- **A moisturizer like glycerin to reduce skin dryness caused by alcohol.**
- **Sometimes they come in foam form to facilitate use and distribution on the hands.**

Occasionally, diluted hydrogen peroxide is added to enhance antimicrobial efficacy.

Alcohol-based hand sanitizers are generally more effective against bacteria but less effective against some viruses such as norovirus (the most common cause of viral gastroenteritis).

Therefore, sanitizers alone may not be sufficient to prevent infection from certain viruses.



The U.S. Centers for Disease Control and Prevention (CDC) recommends washing hands with soap and water instead of relying solely on hand sanitizer, especially when hands are visibly dirty or contaminated with organic material.

Hand sanitizer does not clean hands of dirt or organic matter; it only disinfects them.

Therefore, it is less effective than handwashing with soap in preventing the spread of many pathogens because some germs and viruses may remain on the hands after using sanitizer.

In summary, hand sanitizers are an effective and convenient means of disinfecting hands, especially when soap and water are not available, but they should not replace handwashing when possible.

Proper Handwashing Technique According to WHO :

- **Wet your hands with running water:** **Start by rinsing your hands thoroughly under clean, running water—warm or cold. Wetting your hands helps activate the soap and makes it easier to spread evenly across your skin.**
- **Apply enough soap to cover all hand surfaces:** **Use enough soap (liquid or bar) to fully cover both hands. Soap works by breaking down oils and dirt that trap germs on your skin, making them easier to remove.**
- **Rub your hands together thoroughly:** **Rub your hands to create a rich lather for at least 20 seconds. Be sure to scrub all parts of your hands, including the backs of your hands, between your fingers, under your nails, thumbs, and wrists. This thorough rubbing helps physically remove and kill germs.**
- **Rinse your hands well under running water:** **Rinse off all the soap along with the loosened dirt and germs. Make sure no soap residue remains, as leftover soap can irritate or dry out your skin.**
- **Dry your hands completely with a clean towel or disposable paper:** **Wet hands spread germs more easily than dry ones, so drying your hands fully is essential. Use a clean towel or disposable paper towel to avoid re-contaminating your hands.**
- **Use a paper towel to turn off the tap:** **To avoid touching the dirty tap handle again after washing, use a paper towel to turn off the faucet, especially if it is operated by hand.**

sources :

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