



USAGE OF NEEDLE FREE CONNECTORS OVER THREE-WAY STOPCOCKS FOR INFECTION CONTROL IN HOSPITALS

Dissertation by

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Needle stick injuries and infections

- Needlestick injuries (NSIs) are defined as the injuries caused by hypodermic needles, blood collection needles, or the needles used to connect parts of IV delivery systems.
- When there is a breakage in the skin due to cuts or needle injury, it may lead to contamination into the blood or into the blood fluids, called as percutaneous exposure.
- Mucocutaneous exposure occurs when body fluids encounter open wounds, nonintact skin such as those found in eczema, or mucous membranes such as the mouth and eyes.
- Health care workers or HCWs are also exposed to droplets or the splashes of urine, blood, and saliva.
- Percutaneous injury and splashes of fluids are the source of exposure to blood-borne pathogens such as HBV, HCV, and HIV for HCWs and responsible for a significant proportion of infections in this group.

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- Unreported needlestick injuries are a serious problem and stop injured HCWs from receiving postexposure prophylaxis against HIV, which is shown to be 80% effective in preventing HIV infection in these subjects.
- Every year more than 3 million HCWs are exposed to blood and body fluids through a sharp needle injury in the US alone with an annual estimated 6 million NSIs. Due to NSIs, the risk of infections ranges from as low as 0.2-0.5% for HIV to as high as 3-10% for HCV and 40% for HBV.

Needle free connectors

- Needle-free connectors (NFC) provide a needle-free access at the end of the catheter for IV medication administration, fluid infusion, or withdrawal of blood samples or to connect the sets to the intravascular catheters. Needle-Free Connectors are important in vascular access, for both the patient's and the healthcare professional's safety.
- Needle-Free Connectors prevent healthcare workers' exposure to bloodborne pathogens by preventing needlestick injuries, whilst acting as a microbial barrier to protect the patient. The correct use of Needle-Free Connectors can reduce the risk of HABS (Hospital Acquired Blood Stream Infections)

Three-way stopcocks

- Three-way stopcocks consist of a valve or rotating plug that controls the flow of fluid from a container through a tube. A Three-way stopcock can be used on IV tubing to turn off one solution and turn on another one. It is open to the air, without a membrane when the cover is not in place and so, it is called an open IV system.

Needle free connectors and Three-way stopcocks



Needle free connector



Three-way stopcock

Methodology

- **Research instrument:**

The instrument is a questionnaire checklist to gather the required data. The draft of the questionnaire is based on readings, previous studies, and professional literature. In the preparation of the instrument, the requirements in designing good data collection will be considered.

- **Research questions**

- How are needle-free connectors effective than three-way stopcocks?
- What is the scenario in the market for three-way stopcocks and needle-free connectors?

- **Research objectives**

- To understand the usage of NFCs and three-way stopcocks.
- To find the effects and benefits of NFCs over three-way stopcocks.

- **Exclusion and inclusion criteria:**

- All the people, especially those with Nursing backgrounds, either practice or education were included, and all others were excluded.

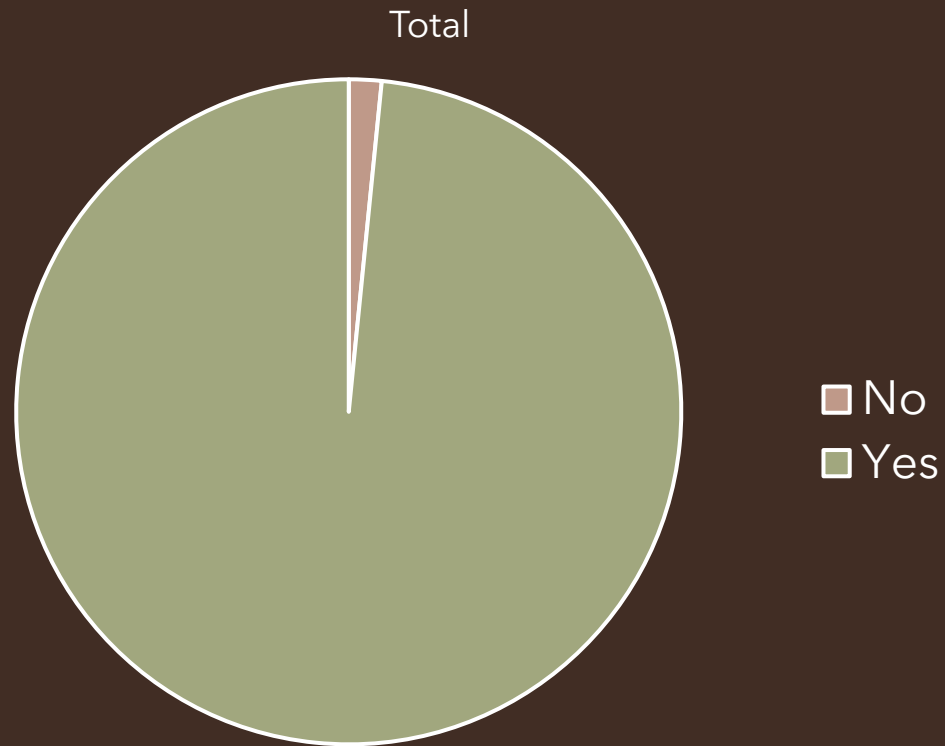
Results and Discussion

The study included 63 respondents belonging to the nursing background. A questionnaire, with the help of industry experts, was made to understand the awareness of NFCs among nurses and their usage. It was also helpful to understand the usage of NFCs over three-way stopcocks for controlling needle stick injuries and hospital-acquired infections.

It included different parameters like

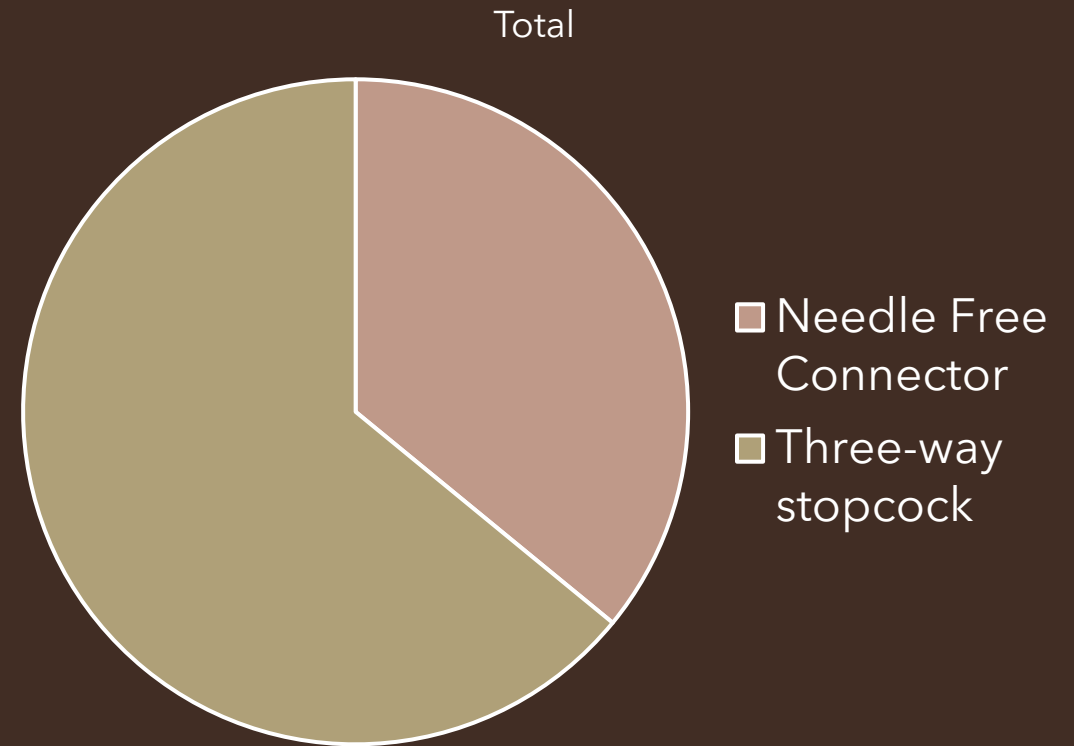
- Awareness of the product
- Preference
- Usage
- Risk factors

Awareness of the product



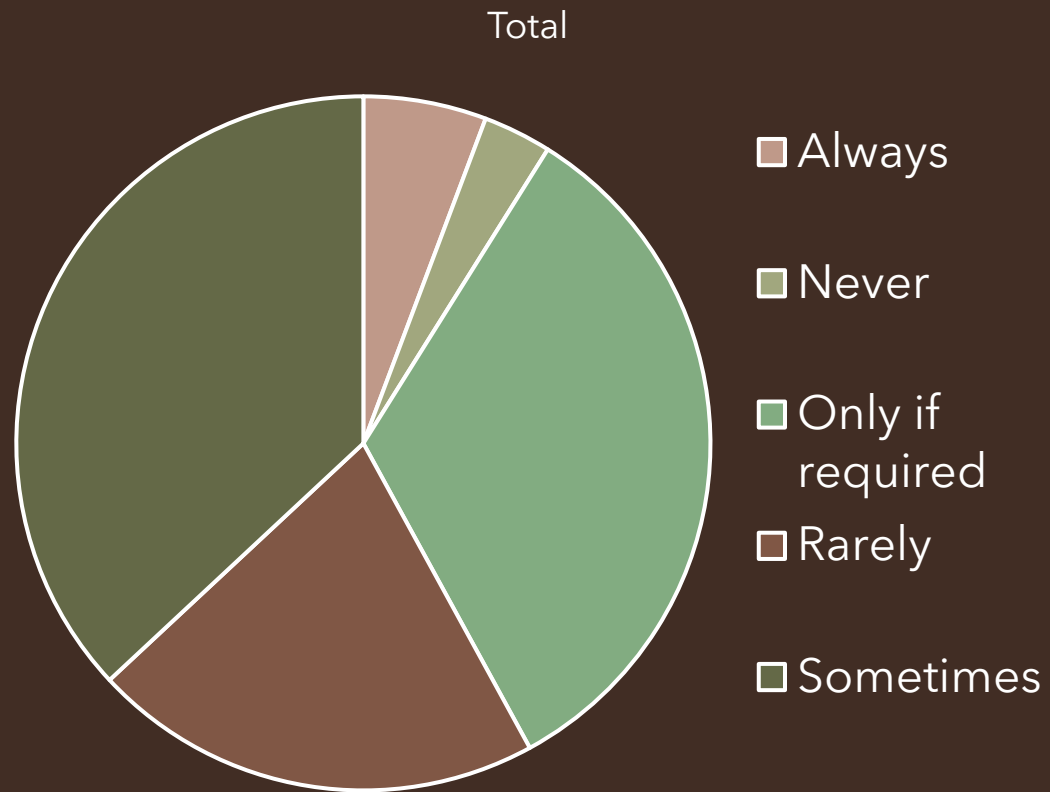
When surveyed, most of the nurses knew about the product but had limitations for its usage.

Most preferred product

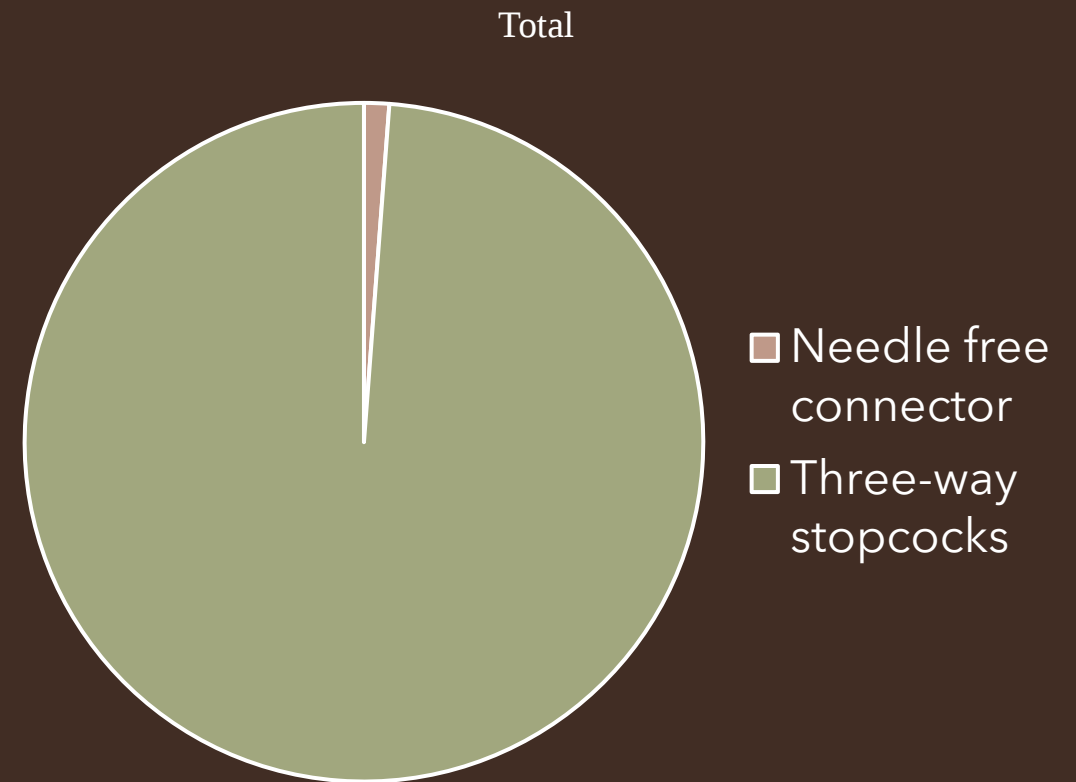


Among both the products, three-way stopcocks were mostly used. Some of the limitations included here will be discussed.

Usage of NFC over 3WSC



Risk of NSI and infection is high for



Conclusion

- Needle-free connectors and three-way stopcocks are used to connected to the end of the vascular-catheters to enable catheter access or safe IV access for infusions and aspiration.
- When accessing these sites with three-way stopcocks, there is a Luer lock which can be a point of contamination as it is an open system. A needle-free connector is a closed system helping in infection control and preventing the HCW from needle stick injuries. A survey was conducted among the nurses to understand their awareness about NFC, preference, usage, risk, and limitations.
- But, in the practical world, even though NFCs are better in infection control and injury control, three-way stopcocks are mostly used. Factors like pricing, market scenario, requirement, the quantity of fluid to be infused play a major role. Also, from the survey, we understand that most of the nurses were aware of the product, and they require product training to understand the benefits and usage of the product.



THANK YOU