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Nurses' Knowledge Regarding Preventive Measures for Viral Hepatitis B&C in Dialysis Unit

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Abstract **Background:** The main viral infection among patients on chronic hemodialysis remains viral hepatitis, which represents a major health issue, first with a high prevalence and then with a progressive risk to chronicity, developing either cirrhosis or hepatocellular carcinoma. According to the Community and Hospital Infection Control Association; infection prevention and control must be made up of evidence-based knowledge, and up-to-date skills and implementation practices. **Aim:** The aim of this study was to assess nurses' knowledge regarding preventive measures for viral hepatitis B&C in hemodialysis dialysis unit. **Design:** A descriptive exploratory design was utilized in the current study. **Setting:** The study was carried out in two hemodialysis units at Beni-Suef University Hospital and Elwasta General Hospital in Beni-Suef Governorate. **Subjects:** A convenient sample of 76 hemodialysis nurses, of whom 22 were men and 54 women. **Results:** about 57.9% of the dialysis nurses have 2-5 years of experience in dialysis unit. Furthermore, 76.1% of them attend program for new dialysis nurses, 53% of them have fair level; however, 37% of them had good level of total knowledge about general knowledge about preventive measures of infection control in dialysis unit and infection control inside dialysis unit. **Conclusion:** Most of dialysis nurses' have correct knowledge about the methods and supplies of infection control in the dialysis unit and the disinfectant that used when sterilizing machines, respectively. However, 78.9% & 76.3% of them have incomplete knowledge about the nursing actions share in the transmission of viral hepatitis helps to transmission of viral hepatitis and the isolation of dialysis machine for certain patients, respectively. **Recommendations:** Increase availability of supplies and equipment, especially which concerned With infection control as personal protective equipment, alcohol rub in a dispenser inside the dialysis rooms and close from the point of care.

Keywords: *viral hepatitis, nurses' knowledge, preventive measures*

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1. Introduction

The developmental period of elder hood is an essential part of a healthy society and as important as childhood or adulthood .We can expect to spend 40 or more years as older adults and our preparation for this time in our lives certainly demands attention as well as expert care from nurses. How does one maximize the experience of aging and enrich the years of elder hood despite the physical and psychological changes that may occur [1-17].

The main viral infection among patients on chronic hemodialysis (CHD) remains viral hepatitis C, which represents a major health issue, first with a high prevalence and then with a progressive risk to chronicity, developing either cirrhosis or hepatocellular carcinoma. In addition, there is the risk of cross-contaminations in dialysis units. Furthermore, hepatitis viral infections in hemodialysis patients cause liver disease in renal failure patients undergoing replacement therapy. They also pose a significant problem in the management of these cases as patients with renal failure cannot clear the viruses effectively. Patients with coinfections with these viruses develop severe clinical presentations and resistance to interferon treatment [18].

According to the Community and Hospital Infection Control Association (2021) infection prevention and control must be made up of evidence-based knowledge, and up-to-date skills and implementation practices. Nurses can play a key role in modeling and promoting knowledge regarding evidence-based practices to prevent occurrence of infections and minimize its complications, especially in HD units. Nurses are in a unique position and frequently asked to provide care for HD patients. Nurses as members of the healthcare team lead the rest of the team in

practicing prevention strategies to protect the patient from infection. Utilizing the skills and knowledge of nursing practice, nurse can facilitate patient recovery while minimizing complications related to infections [19].

2. Aim of the Study

The aim of this study was to assess nurses' knowledge regarding preventive measures for viral hepatitis B&C in hemodialysis dialysis unit

2.1. Research Questions

What about hemodialysis nursing staffs' knowledge regarding general precautions for infection control for viral hepatitis B&C in hemodialysis dialysis unit?

What about hemodialysis nursing staffs' knowledge regarding specific precautions for infection control for viral hepatitis B&C in hemodialysis dialysis unit?

3. Subjects and Methods

3.1.Research Design

To achieve the goal of the study, a descriptive exploratory study was used.

3.2. Subjects & Setting

3.2.1. Setting: The study was carried out in two hemodialysis units at Elwasta General Hospital and Beni-Suef University Hospital in the governorate of Beni-Suef.

3.2.2. Subjects

3.2.2.1. Sample Size

All 76 hemodialysis nurses who provided direct patient care, with 22 men and 54 women, consented to take part in the study.

3.2.2.2. Sampling Type

A convenient sample

3.2.3. Tools of Data Collection

A. Tool (I): Knowledge Assessment Questionnaire

The researcher created a modified Arabic self-administered questionnaire using the original tool created by (Alpers, 2020) and literature reviews (Setia et al., 2021) [20-21]. There were two primary components to it:

Part I: Socio-demographic characteristics questionnaire sheet:

This part was developed by the researcher to collect data about nurses' personal and background data; years of experience in nursing practice and in dialysis units, previous attendance of in-service training program about infection control, opportunity to view the courses and medical journals, and participate in scientific conferences for dialysis and kidney disease during the last 5 years.

Part II: Nurses' knowledge regarding Preventive Measures for Viral Hepatitis B&C in Dialysis Unit

This part was developed by the researcher to collect data about nurses' knowledge regarding Preventive Measures for Viral Hepatitis B&C in Dialysis Unit. It divided into two sections; General precautions for infection control in dialysis unit & Specific precautions for infection control in dialysis unit. Then, the total score of the questionnaire was grades; the complete correct answer was scored as a two point, the incomplete correct answer was scored as a single point and the wrong answer or don't know was scored as a zero point. These scores were summed and were converted into a percent score. It was classified into three categories:

- Good knowledge if score ≥ 75%.
- Fair knowledge if score 50-< 75%.
- Poor knowledge if score from <50%.

3.2.4. Validity and Reliability

Content Validity:

- Tool validity was assessed to determine the extent to which the employed tools measure what is intended to be measured. Five community health nursing experts from the nursing department at Beni-Suef University served as a panel to review the instruments' content and face validity.

Reliability: In the present study, reliability was tested using Cronbach's Alpha coefficients:

- Among senior patients in the dialysis units, nurses' knowledge of viral hepatitis B and C was 0.823.

3.2.5. Preparatory Phase

Using textbooks, articles, journals, and websites, this phase began with a survey of recent and historical, national and international, related literature about the study's subjects.

3.2.6. Pilot Study

A pilot study was conducted on 10% of the entire study sample (8 nurses) in order to check the tools' applicability, effectiveness, and clarity as well as the fieldwork's viability and to look for any potential challenges that the researcher might encounter.

3.2.7. Field Work

To gather information about nurses' understanding of the elderly and dialysis, researchers gave the self-administered questionnaire to the nurses who accepted to participate in the study.

3.2.8. Ethical Considerations

The Beni-Suef University Faculty of Nursing's scientific research ethical committee gave its clearance before the study was carried out. Each eligible individual was told of the purpose and significance of the study at the initial interview as well.

3.2.9. Administrative Design

The dean of the nursing faculty at Beni-Suef University wrote an official letter to the hospital serving the university, Elwasta General Hospital, requesting their permission to perform the study.

3.2.10. Statistical Design

The Statistical Package for Social Science (SPSS) version 25 computer programme and Microsoft Excel were used to conduct the statistical analysis of the data. For categorical data, frequencies and percentages were used, while for quantitative data, the arithmetic mean (X) and standard deviation (SD) were used. Data were presented using descriptive statistics. Qualitative variables were compared using chi square test (X^2). Degrees of significance of results were considered as follows:

- P-value > 0.05 Not significant (NS)
- P-value ≤ 0.05 Significant (S)
- P-value ≤ 0.01 Highly Significant (HS).

4. Results

Figure 1: presents frequency of dialysis nurses according to their experiences. It shows that 57.9% of the dialysis nurses have 2-5 years of experience in dialysis unit. Furthermore, 76.1% of them attend program for new dialysis nurses.

Figure 2: presents frequency of dialysis nurses according to their opportunity to view the courses and medical journals and participation in conferences. It shows that 23.7% of them have the opportunity to view the courses and medical journals and 15.8% of the dialysis nurses participate in scientific conferences for dialysis and kidney disease during the last 5 years

Figure 3: Presents dialysis nurses' knowledge about general precautions for infection control in dialysis unit. It demonstrates that 52.6% & 88.2% of the dialysis nurses have correct knowledge about the cases that dialysis nurses must always change gloves and the area for preparing medication for the patient, respectively. Also, 71.1% & 61.8% of them have incomplete knowledge about the usage of gloves in dialysis unit and time that hands should be washed, respectively.

Figure 4: Presents dialysis nurses' total knowledge about general precautions for infection control in dialysis unit. It portrays that 53% of them have fair level; however, 37% of them had good level of total knowledge about general knowledge about preventive measures of infection control in dialysis unit and infection control inside dialysis unit.

Figure 5: Presents dialysis nurses' knowledge regarding specific precautions for infection control in dialysis unit. It portrays that 55.3% & 60.5% of the dialysis nurses have correct knowledge about the methods and supplies of infection control in the dialysis unit and the disinfectant that used when sterilizing machines, respectively. Also, 78.9% & 76.3% of them have incomplete knowledge about the nursing actions share in the transmission of viral hepatitis helps to transmission of viral hepatitis and the isolation of dialysis machine for certain patients, respectively.

Figure 6: Presents dialysis nurses' total knowledge regarding specific precautions for infection control in dialysis unit. It illustrates that 55.3% of them have fair; however, 27.7% of them had good level of total knowledge about specific knowledge about preventive measures of infection control in dialysis unit and infection control inside dialysis unit.

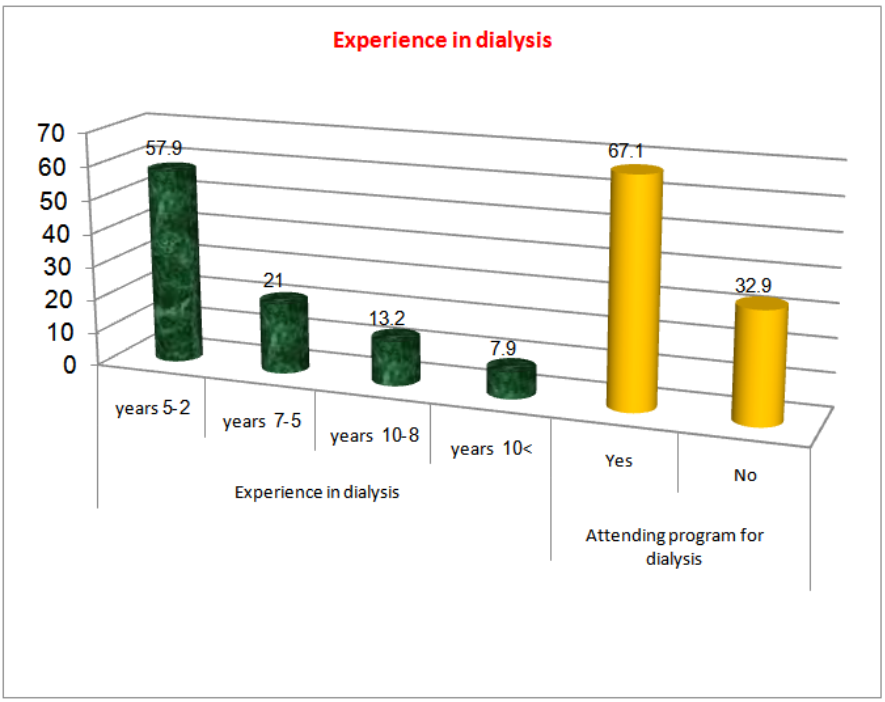

Figure 1. Dialysis nurses according to their experiences

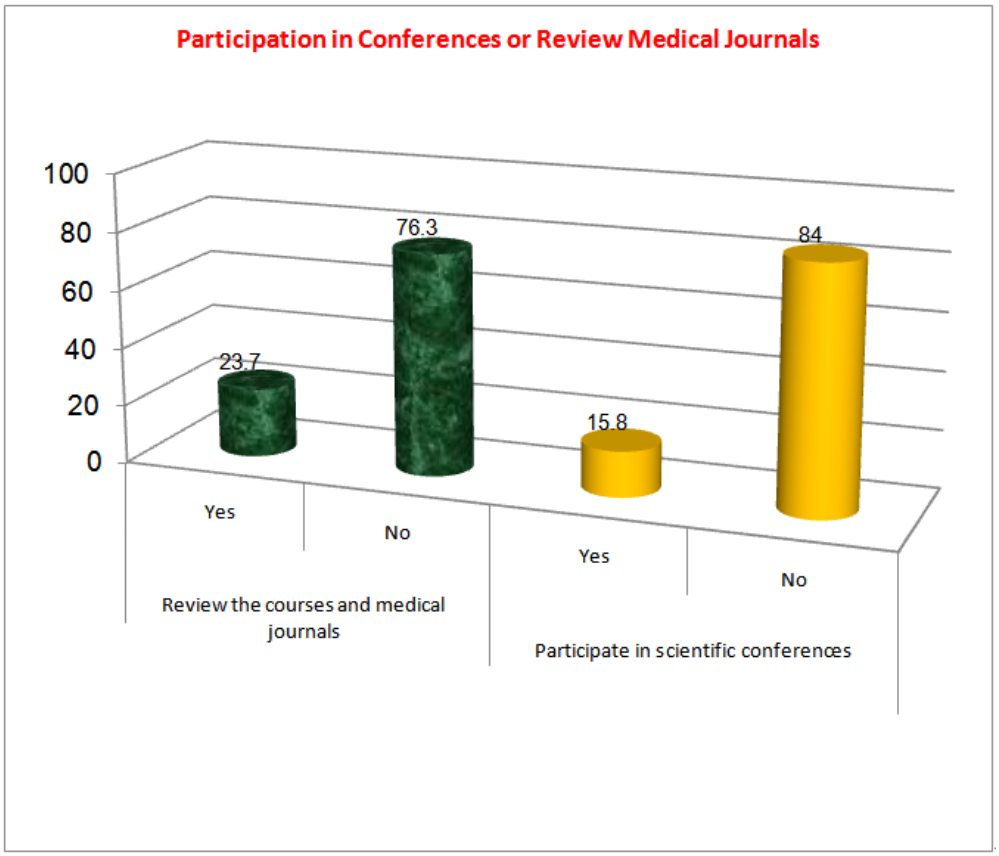

Figure 2. Dialysis nurses according to their opportunity to view the courses and medical journals and participation in conferences

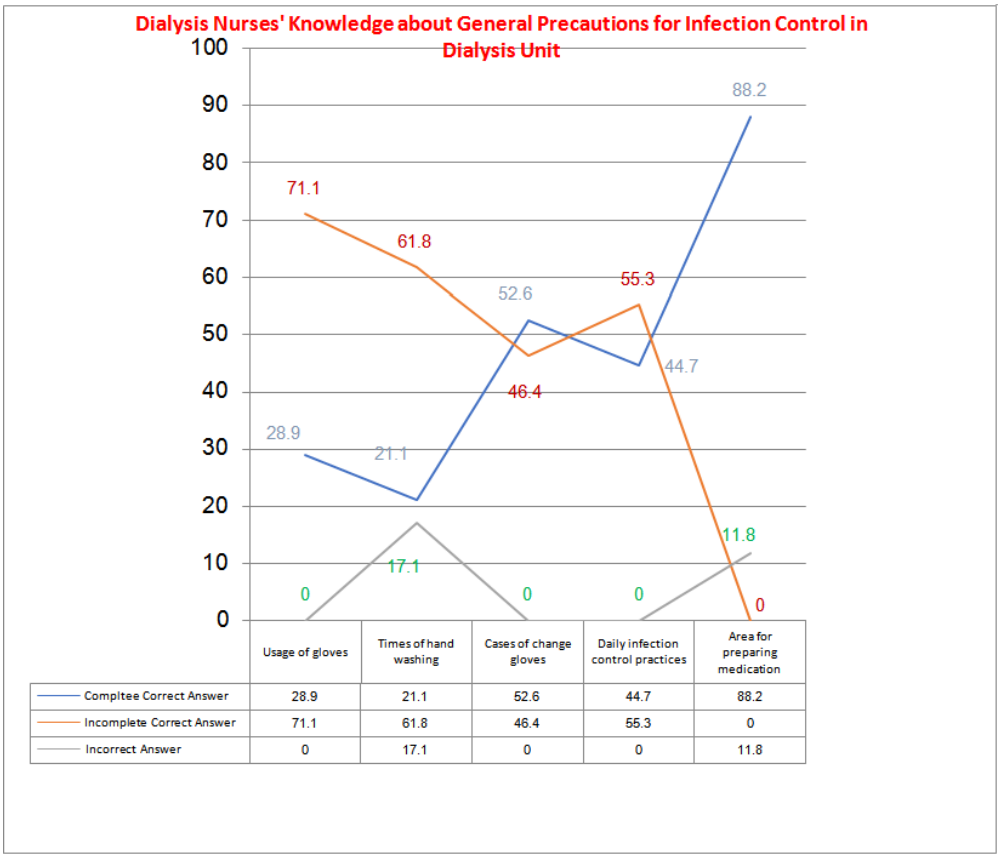

Figure 3. Dialysis nurses' knowledge about general precautions for infection control in dialysis unit

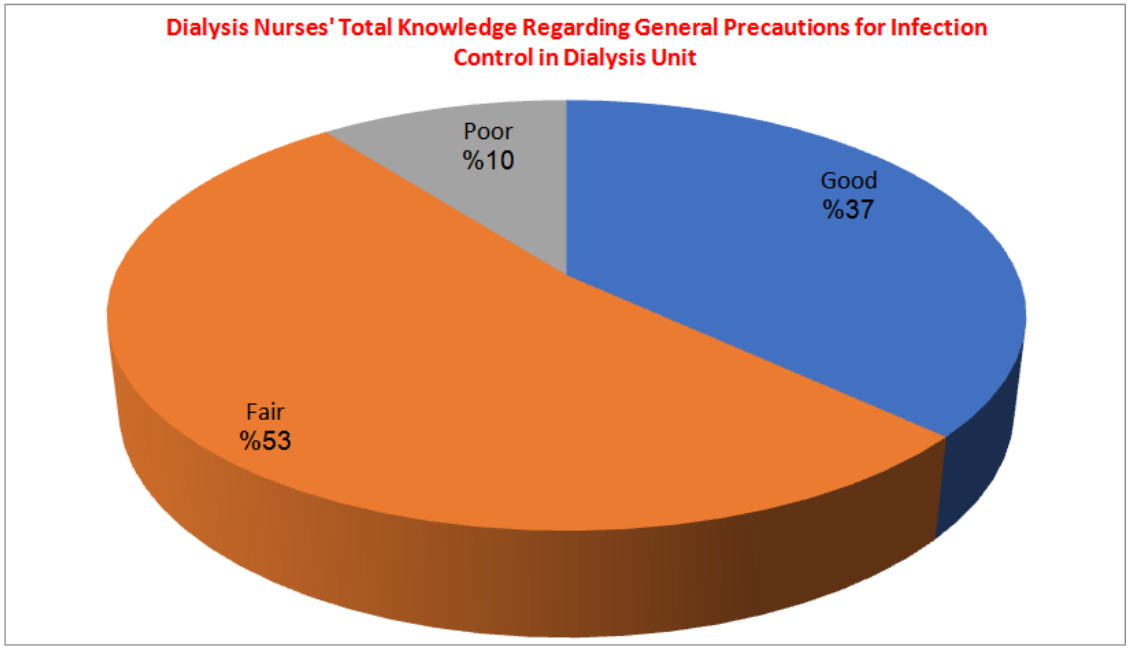

Figure 4. Dialysis nurses' total knowledge regarding general precautions for infection control in dialysis unit

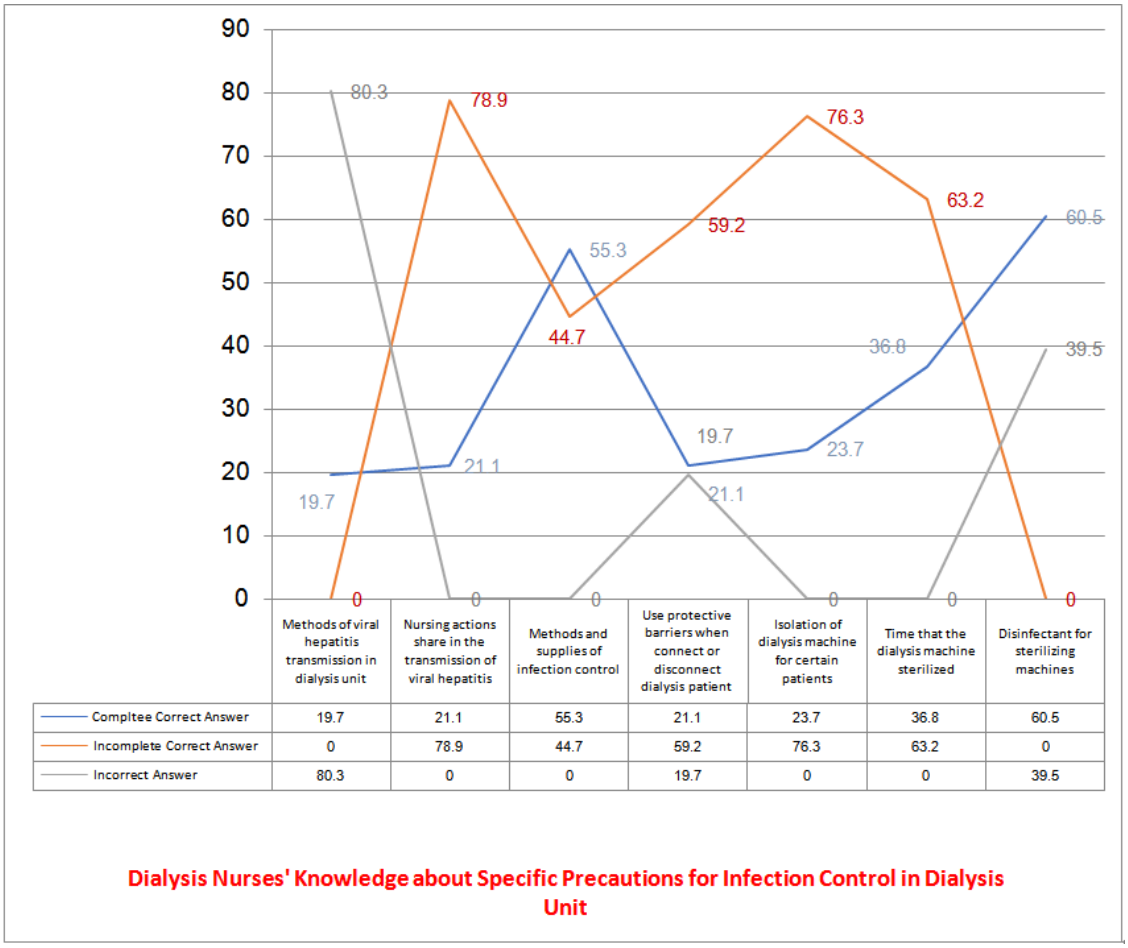

Figure 5. Dialysis nurses' knowledge about specific precautions for infection control in dialysis unit

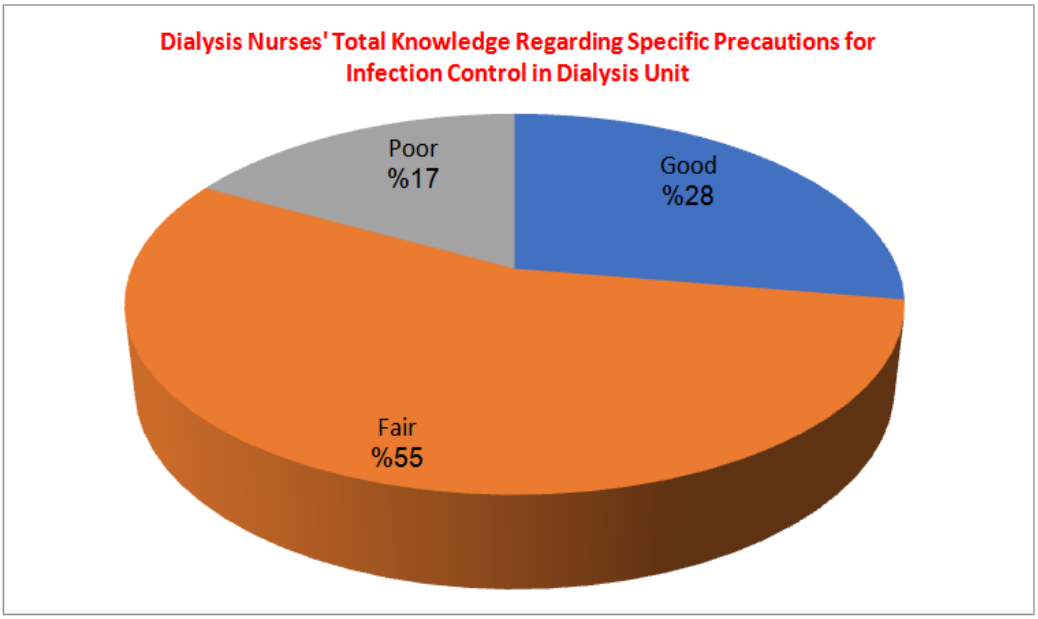

Figure 6. Dialysis nurses' total knowledge regarding specific precautions for infection control in dialysis unit

5. Discussion

Dialysis nurses work with doctors and other healthcare professionals to care for the physical, mental, and emotional well-being of elderly patients, helping them maintain independence and quality of life. These registered nurses (RNs) possess specialized knowledge and skills to treat common health issues affecting the elderly population. All nurses are expected to follow Standard Precautions for infection control. This includes performing hand hygiene, using personal protective equipment or PPE, and following safe injection practices [22-24].

As regard knowledge level related to preventive measures of infection control in dialysis unit. The study findings revealed that more than half of nurses have correct knowledge about the cases that dialysis nurses must always change gloves and the area for preparing medication for the patient, respectively. Also, less than three quarters of them have incomplete knowledge about the usage of gloves in dialysis unit and time that hands should be washed, respectively. Moreover, more than half of the dialysis nurses have correct knowledge about the methods and supplies of infection control in the dialysis unit and the disinfectant that used when sterilizing machines.

Regarding the knowledge and some practice characteristics that might be determinants of positive attitudes, the current study finding revealed that a large percentage of the studied subjects have positive attitude toward prevention of viral hepatitis B&C infection transmission in HDU. The great majority of respondents agreed that evidence-based infection-control measures provide adequate protection against transmission of blood borne pathogens among HCWs, and this result is in accordance with Frazer, Glacken, Coughlan et al;. (2021). study in surveying nurses working in primary care, reported that almost (90%) of respondents agreed that infection-control precautions would protect them from acquiring viral hepatitis [25].

Regarding nurses' knowledge about general precautions for infection control in dialysis unit and level of nurses' knowledge related to preventive practices against viral hepatitis (B &C) infection, the study findings revealed that more than two thirds of nurses have satisfactory level of knowledge. This represents a major defect since there is scientific evidence suggests that the environment can serve as a reservoir for infectious virus; as denoted by Di Marco, L& Di Marco, (2022) since a considerable percent reported that they shouldn't wear gloves whenever preparing the machine and when using equipment respectively; while a large proportion of the studied subjects reported that they should comply with wearing gloves when connecting patients on dialysis and when disconnecting patients off dialysis respectively [26].

For dialysis nurses' knowledge regarding specific precautions for infection control in dialysis unit, the results reveals that more than half of the dialysis nurses have correct knowledge about the methods and supplies of infection control in the dialysis unit and the disinfectant that used when sterilizing machines, respectively. The researcher may interpret this deficit in practice level regarding preventive measures of viral hepatitis B&C transmission to be due to lack of effective supervision, lack of reward and punishment policy, low educational level of nursing staff, increase patient nurse ratio and misconception or unawareness of the application of isolation policy. These interpretations are also supported by Gisselquist (2021) study, entitled "knowledge and practices of universal precautions among basic B. Sc. nursing students who reported that lack of established protocols, and an absence of performance appraisal and nursing audit all are reasons for poor performance [27-30].

6. Conclusion

Most of dialysis nurses' have correct knowledge about the methods and supplies of infection control in the dialysis unit and the disinfectant that used when sterilizing

machines, respectively. However, 78.9% & 76.3% of them have incomplete knowledge about the nursing actions share in the transmission of viral hepatitis helps to transmission of viral hepatitis and the isolation of dialysis machine for certain patients, respectively.

7. Recommendation

Increase availability of supplies and equipment, especially which concerned with infection control as personal protective equipment, alcohol rub in a dispenser inside the dialysis rooms and close from the point of care.

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