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*Research Article*

## **Student Nurses Knowledge of Multiple Sclerosis and its Care**

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### **Abstract**

Nursing college students from Northern Border University in Arar, Saudi Arabia, are the study participants. They examined their level of knowledge and understanding the care of patients with multiple sclerosis. Multiple sclerosis is a complicated neurological condition that requires extensive and holistic nursing care because of its symptoms, which have a substantial negative impact on the patient's quality of life. Therefore, nurses are crucial in helping and educating multiple sclerosis patients and their caretakers through education and training programs. Most of the nursing students complete their education with insufficient knowledge and training on multiple sclerosis care, specifically with regards to patient care support and symptoms management. Eighty nursing students were selected from the fourth year and internship program; the students are asked to complete a semi-structured questionnaire as a part of a nonexperimental descriptive study design. The tool focused on the etiology, symptoms, risk factors, and nursing interventions of patients with multiple sclerosis. The findings of the study clearly showed that the students have a basic knowledge on multiple sclerosis, there were significant gaps in certain areas like pharmaceutical management, chronic symptom management, and tiredness reduction. The internship students knowledge were slightly better than the fourth-year students; this was mainly due to their clinical experience. But both groups had less knowledge with more complex multiple sclerosis care, such as special therapies and psychological assistance. There was a Significant correlation between knowledge level and demographic characteristics like age, marital status, and previous experience with multiple sclerosis care was found by statistical analysis. These results highlighted the necessity of improving the nursing course content specifically on the disease condition, prognosis, and nursing management of patients with multiple sclerosis by incorporating simulation-based learning and advanced care techniques. These knowledge gaps can be covered by implementing multiple sclerosis focused educational modules and hands-on training, which would help to enhance the competence level of student nurses to deliver holistic care during their working phase with multiple sclerosis.

**Key words:** Multiple sclerosis, Student nurses, Knowledge level, Care.

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### Introduction:

Multiple sclerosis is a chronic, progressive, irreversible, and unpredictable disease that needs specialist, multidisciplinary care for efficient patient management (Browne et al., 2014). Multiple sclerosis is a complicated, long-term neurological disorder that can be greatly impacted by the symptoms, such as fatigue, cognitive deficits, and physical weakness, which will directly affect the quality of life (Hauser & Cree, 2020). Multiple sclerosis is caused by the damage of the protective myelin sheath that surrounds the neurons, which is the prime factor for multiple sclerosis, which is also known as demyelinating diseases of the nervous system. Myelin sheaths are the fatty coverings of the nerve cells that aid in effective electron transportation. The transmission of the nerve impulses can be hampered by damage or destruction of this myelin sheath, which manages the space for electron transfer between the neurons. This can lead to malfunction in the brain's ability to communicate with the human body (Abd El Hamid et al., 2020). Multiple sclerosis is a non-traumatic neurological condition that most frequently disables the quality of life of the young adults. A person's risk of contracting this neurological disorder has been increased marginally due to environmental factors, including exposure to ultraviolet B, Epstein-Barr virus infection, obesity, and smoking (Dobson & Giovannoni, 2018). There are five types of multiple sclerosis, each one explaining a distinct prognosis, attack frequency, prognosis pattern, and health status in between episodes. The fifth type includes all of the following and other types that include progressive-relapsing, primary progressive, secondary progressive, and relapsing-remitting (Shabany et al., 2021). According to Ascherio & Munger (2016), the epidemiology of multiple sclerosis is an autoimmune disease marked by recurrent attacks on the CNS; the exact causes of multiple sclerosis are unknown. The major clinical manifestations of multiple sclerosis are extreme fatigue, incoordination, weakness, tingling, impaired sensation, visual impairment, bladder incontinence, cognitive impairment, and mood swings. The initial symptoms can be noticed at any age, but it can evolve over time in the same individual. In his late twenties, initial symptoms will recover to some extent, but gradually they become permanent (Olek, 2021). A competent health care team should always be part of managing the patient with multiple sclerosis due to its clinical nature and challenges. In which the nurse's role takes a major part in providing holistic care. The nursing specialists in this team help the patient and family in caring, educating, supporting, and counseling. During the

different stages of disease prognosis, the nurse helps the patient to identify and treat symptoms, relapses, and side effects of pharmacological intervention.

This care paradigm places a vital and strong emphasis on nurses because they are the pivotal point around patient education, emotional support, and symptom control. Most of the studies show that a large number of nursing graduates have less knowledge regarding the complex demands of multiple sclerosis patients (McCabe et al., 2015). According to Rieckmann et al. (2015), the nurse's expertise is frequently lacking in organizing rehabilitation and support services for multiple sclerosis patients. The majority of nurses are unaware of advanced rehabilitation techniques such as cognitive rehabilitation, occupational therapy for fatigue management, and physical therapy for spasticity. A research study by Van Dongen et al. (2016) found that the nurses are less aware of the disease's prognosis treatment options and overall care requirements, and most of the time they are unprepared to manage the complex needs of the patient in long-term management. Many Research reveals that the current nursing curriculum does not adequately cover the demands of the patients with multiple sclerosis, mostly in the relapse management, rehabilitation, and psychological support (Diaz et al., 2018). In order to fill the gaps, the nursing curriculum should give more importance to understand the progress of multiple sclerosis. Most of the study emphasized the importance of deeper understanding about multiple sclerosis and its management that can be implemented through modern nursing education and training.

### Significance of the study:

Multiple sclerosis is increasing its incidence and prevalence over the last decades. Globally, about 2.8 million people are affected (Jakimovski 2024). Multiple sclerosis remains one of the most common neurological disorders among the young adult population between the age group of 18-40 years.

A retrospective record review was conducted in Saudi Arabia from July 2022 to July 2023; the finding reveals that 70% of multiple sclerosis patients were female (Hindi et al., 2024).

The incidence, prevalence, and resulting health impact of multiple sclerosis varied significantly between nations, reflecting variations in genetics, environmental variables, and health care systems.

The Gulf region is less risky for multiple sclerosis; new data indicates that there is a significant raise in the number of cases from 31 to 55 per 100,000. very few

research studies connect this rise in cases to dietary changes, vitamin D deficiency, and parent relationships. (Jumah et al., 2019)

Multiple sclerosis patients abandoned their employment due to depression and social life restriction (Renner et al., 2020).

Nurses play a crucial role in teaching patients, sharing information regarding the disease prognosis, understanding the medications tolerance and its side effects, and addressing the importance of drug compliance. Through their proper interpersonal relations, they are uniquely skillful at getting additional information from the patients and family members, which will significantly help the neurologist to take a decision (Saposnik et al., 2021).

Most of the new nursing staff have a low level of understanding about multiple sclerosis and its treatment when compared to the experienced nursing staff. This clearly shows that experience is the source of their knowledge. These findings depict that nursing education regarding multiple sclerosis needs to be expanded (ErogluNermin et al., 2022).

According to a study conducted in Australia among the nurses taking care of multiple sclerosis patients, it shows drastic improvement in patients' quality of life, symptom management, and disease progression. To deliver such comprehensive care, the nurses must have adequate nursing education and training in order to enhance patient quality of life and coping mechanisms. as well as prioritizing the nursing diagnosis and action required a deep understanding of multiple sclerosis and its specific criteria (ErogluNermin et al., 2022).

Multiple sclerosis-specific continuing education is highly necessary to increase the trainee nurse's skill and confidence in taking care of patients with multiple sclerosis. Kluger et al. (2018) This study reveals that the nurses understand symptom management. medication administration, and patient assistance for ADL has shown significant improvement by the multiple sclerosis -focused continuing education program. The nurses who participated in the continuing education workshop demonstrated significant skills in identifying the relapse in multiple sclerosis, symptom treatment such as fatigue and spasticity, and patient education on lifestyle modification.

A study by Pakenham et al., 2017, indicates that the neurology nurses lacks in knowledge and understanding regarding drug action and its side effects, especially during the administration of newer drugs for multiple sclerosis patients, so it's mandatory to provide training for the nurses about the newer development in multiple sclerosis therapies.

Nursing student knowledge was evaluated by McCabe et al. (2015), who reported that the student nurses can identify common symptoms, but they are not well versed in complex care management. Nursing programs don't include adequate information regarding the long-term neurological conditions like multiple sclerosis that

directly impact patient care. Multiple sclerosis -focused content should concentrate more on patient education and relapse management (Diaz et al., 2018).

According to Morgan et al., 2020, the student nurses showed improved proficiency with patient communication, symptom management, and patient demands through multiple sclerosis -specific simulations. Kesselring et al. (2019) state that student nurses should require more information to support multiple sclerosis patients physically. Emotionally and psychologically, it will be a difficult task for the student nurses to comprehend the etiology, types, and diagnostic methods. The nursing student needs to get in depth knowledge and awareness of multiple sclerosis decision making during their clinical training to communicate with the patient and family members, support their psychological wellbeing and to provide them the resources they need to cope with their illness through a qualified mentor.

### **Statement of the Problem**

Assess the knowledge level of Multiple Sclerosis and Its Care among Student Nurses at Northern Border University, Arar, Saudi Arabia.

### **Objective:**

1. To assess the knowledge level on multiple sclerosis and its care among nursing students.
2. To compare the knowledge level of multiple sclerosis and its care with internship nursing students and fourth-year nursing students.
3. To find the association between the selected demographic variables.

### **Research Questions**

The present study will answer the following questions:

- What is the knowledge level of student nurses at Northern Border University, Arar on multiple sclerosis and its care?

### **Operational definition:**

**Student Nurses:** B.Sc. (N) nursing students in the College of Nursing, Northern Border University, which includes fourth-year students and internship students.

**Knowledge:** It refers to the ability of student nurses to respond to the questions related to multiple sclerosis and its care, which will be measured by a semi-structured knowledge questionnaire.

**Care:** The provision of what is necessary for the health, welfare, maintenance, and protection of patients with multiple sclerosis.

**Multiple sclerosis:** It is a disease that affects the brain and spinal cord. It can cause a wide range of symptoms, such as trouble seeing, moving the arms or legs, feeling things, or keeping your balance (Olek, 2021). As used in this study, multiple sclerosis pertains to disability, fatigue, and shortness in the cognitive skills.

**Inclusion criteria:**

1. Fourth-year nursing students, NBU, Arar, Kingdom of Saudi Arabia
2. Internship nursing students, NBU, Arar, Kingdom of Saudi Arabia

**Exclusion criteria:**

1. First-year nursing students, NBU, Arar, Kingdom of Saudi Arabia
2. Second-year nursing students, NBU, Arar, Kingdom of Saudi Arabia
3. Third-year nursing students, NBU, Arar, Kingdom of Saudi Arabia
4. Student nurses who are not willing to participate in the study.

**Research methodology:**

**Research Design:** - In this study the researchers adopted a nonexperimental descriptive design.

**Setting of the study:** This research study was carried out in College of Nursing, Northern Border University, Arar, during the academic year 2022-2023.

**Study period:** The data was collected for one month from January 2023 to June 2023.

**Target population:** The target population of this study was nursing students studying in NBU, Arar, Saudi Arabia.

**Study Population:** The study population was the nursing students from fourth year and internship program.

**Sampling method:** Non-probability Convenient Sampling was adopted based on inclusion and exclusion criteria.

**Sample Size:** The sample size of the study consists of 80 student nurses from internships and fourth year nursing program.

**Selected Demographic Variables:** Age, marital status, year of study, caring for an individual with multiple sclerosis during the study period.

**Description of the questionnaire:** A Semi-Structured knowledge questionnaire prepared by the researchers had been used.

The questionnaire consisted of two parts:

Part 1: The demographic variables considered in this study include age, marital status, year of study, and experience caring for an individual with Multiple Sclerosis during the study period. These demographic variables were used to explore potential associations with the participants knowledge of multiple sclerosis and its care.

Part 2 - The questionnaire used in this study consists of 29 items, designed to assess the knowledge of Multiple Sclerosis (MS) and its care among nursing students. The questionnaire is divided into the following sections:

- Knowledge of Multiple Sclerosis: 12 items
- Nursing Care Areas:
  - Nutrition: 1 item
  - Stimulating Motor Function: 7 items
  - Reducing Fatigue: 2 items
  - Enhancing Sensory Function: 4 items
  - Maintaining Elimination: 3 items

In total, the questionnaire includes 29 items. Each correct response was assigned a score of 1, while incorrect responses received a score of 0. The maximum possible score is 29.

**Scoring:**

Excellent knowledge on multiple sclerosis and its care—total score 20 and above.

Average Knowledge on Multiple Sclerosis and Its Care - Total Score 10-19.

Poor knowledge on multiple sclerosis and its care—total score less than 9.

**Validity of the tool:**

Both the English and Arabic versions of the tool were reviewed by two professionals from the Medical Surgical Nursing department and one professional from Public health nursing department

**Reliability of the tool:**

A pilot study was conducted among 8 student nurses, that was ten percent of the study sample (80), to identify the feasibility, applicability, and clarity of the tool. The period of the pilot study was 2 days; thus, the reliability of the tool was obtained. Results from the pilot study informed the final version of the study tool created and participants in the pilot study were subsequently removed from the study population.

**Data collection procedure:**

The subjects were selected through a non-probability convenient sampling technique, and an informed consent was obtained from the study participants. A semi-structured questionnaire that had been in both English and Arabic were used to assess the level of knowledge on multiple sclerosis and its care through Google Forms. Only 20-30 minutes had taken to complete the questionnaire by the study participants.

**Delimitations:**

1. The study was limited to student nurses in NBU, Arar, Saudi Arabia.
2. The study was limited to the academic year 1443-1444, 2<sup>nd</sup> semester.
3. The sample size was limited to 80 student nurses.
4. Convenience sampling technique had been used.

**Ethical considerations:**

The study was conducted after getting approval from the following:

1. Ethical committee and research committee.
2. Informed consent from the participants was obtained and assured to maintain confidentiality and secrecy of the study participants.
3. The researcher does not force the participants to participate in the study, and they have the right to leave the study if they are not comfortable.

**Data analysis:** First, a Microsoft Excel document was used to code and tabulate the data. The data from the Microsoft Excel sheet was then imported into SPSS 20 application for data analysis. Demographic information was analyzed descriptively and reported as mean,

standard deviation, and percentages. The chi-square was performed for the analysis.

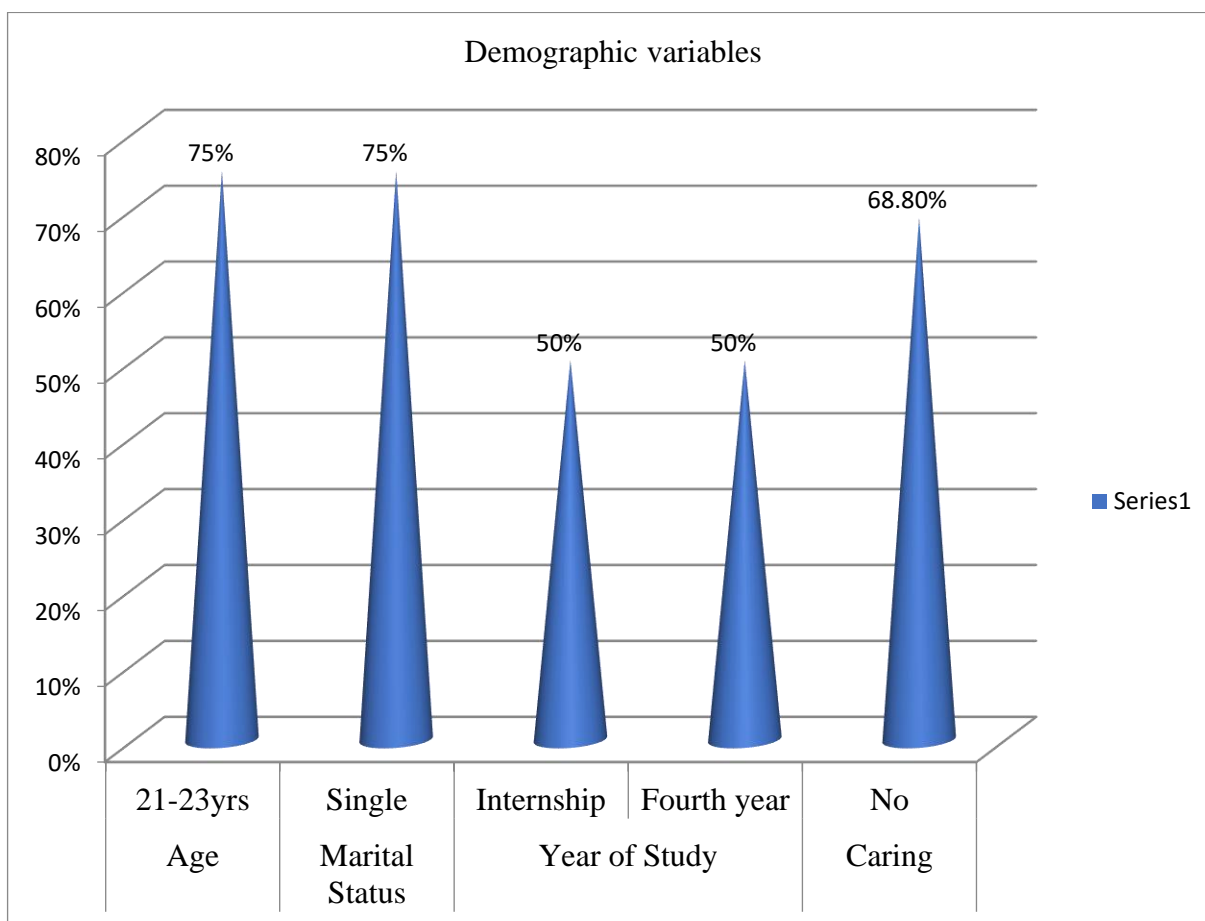
**Result of Data / Statistical Analysis**

In this study, statistical analysis was conducted using the Statistical Package of Social Sciences (SPSS). The

researcher had utilized a descriptive statistic (number, percentage, mean, and SD) in describing the main variable. The first category of data on this research was socio-demographic correlates; the following were as follows:

**Table 1: Socio-demographic characteristics of the study participants (N=80)**

Characteristics	Frequency	Percentage
Age		
Less than 20 years	3	3.8%
21 – 23years	60	75.0%
Above 23years	17	21.3%
Marital status		
Single	60	75.0%
Married	13	16.3%
Separated	7	8.8%
Year of Study		
Fourth year	40	50.0%
Internship	40	50.0%
Caring for an individual with Multiple Sclerosis during the study period		
Yes	25	31.3%
No	55	68.8%



**Figure -1- Socio-demographic characteristics**

As shown on the table 1 and figure 1, it has been clearly shown that the age of most participants was between the range of 21–23 years (75%), and mostly single (75%),

and more than half (55%) of the study participants don't have experience in caring for a multiple sclerosis patient.

**Table 2: Student Nurses knowledge on Multiple sclerosis and its care**

S.No	Questions	True		False	
		N	%	N	%
<b>Knowledge</b>					
Q1	MS is demyelination of the brain, spinal cord, and optic nerve's white matter and usually occurs as small patches	68	85.0%	12	15.0%
Q 2	Any area of the central nervous system's white matter can develop the little patches, or lesions.	60	75.0%	20	25.0%
Q 3	The location of the demyelination affects the patient's symptoms.	65	81.3%	15	18.8%
Q4	Obesity can increase the risk of multiple sclerosis	56	70.0%	24	30.0%
Q 5	Smoking is a risk factor for multiple sclerosis	57	71.3%	23	28.7%
Q 6	Having low levels of Vitamin D and low exposure to sunlight is associated with a greater risk of MS	65	81.3%	15	18.8%
Q 7	Patient may develop Dysarthria and dysphagia	66	82.5%	14	17.5%
Q 8	Patients with MS may experience fluctuations in their mood	58	72.5%	22	27.5%
Q 9	Electrophoresis, Magnetic Resonance Imaging, Visual, auditory and somatosensory evoked potentials are used to diagnosis MS	63	78.8%	17	21.3%
Q 10	Acute cases can be treated with Corticosteroids, Immunosuppressive agents, Beta-interferon	50	62.5%	30	37.5%
Q 11	Chronic cases can be treated with Anti-spasmodic agents, Anti-depressant, Anticholinergics.	51	63.7%	29	36.3%
Q 12	Physiotherapy, psychotherapy, counseling, and general measures to protect one's body health should all be included in the treatment of MS.	67	83.8%	13	16.3%
<b>Nutrition</b>					
Q 13	Small bites and semi-solid food should be offered to the patient to reduce the danger of aspiration that could result from the patient's swallowing difficulties.	66	82.5%	14	17.5%
<b>Stimulating motor function</b>					
Q 14	Physical therapy can ease the symptoms of MS	68	85.0%	12	15.0%
Q 15	Instruct to perform everyday exercises that are both helpful to strengthen and stretch the muscles.	68	85.0%	12	15.0%
Q 16	Teach how to perform stretch-hold-relax activities to reduce muscle spasms and contractures.	66	82.5%	14	17.5%
Q 17	Advise the patient to apply cold packs to the muscles before stretching to reduce spasm.	62	77.5%	18	22.5%
Q 18	Advise to take frequent rest periods and avoid muscle fatigability as much as possible	70	87.5%	10	12.5%
Q 19	Encourage to do activities and ambulate as tolerated.	69	86.3%	11	13.8%
Q 20	Instruct on the proper use of assistive devices such as braces, canes and walkers.	70	87.5%	10	12.5%
<b>Reducing fatigue</b>					
Q 21	Plan activities for each day. Make sure there are enough rest periods in between activities.	69	86.3%	11	13.8%
Q 22	Encourage the adoption of energy-saving strategies, such as sitting while performing some tasks and pushing or pulling objects rather than lifting them up.	65	81.3%	15	18.8%
<b>Enhance sensory function</b>					
Q 23	Suggest to use an eye patch if you have double vision.	69	86.3%	11	13.8%
Q 24	Orient to the surroundings; keep personal belongings and furniture on fixed arrangement.	69	86.3%	11	13.8%
Q 25	Encourage using other senses to make up for diminished sensation.	70	87.5%	10	12.5%
Q 26	Provide a clutter-free and safe environment.	72	90.0%	8	10.0%
<b>Maintaining Elimination</b>					
Q 27	Ensure adequate hydration to prevent urinary tract infection and stones.	71	88.8%	9	11.3%
Q 28	For the patient's bladder problems, regular emptying of the bladder is provided with intermittent catheterization, catheterization training and kegel exercises training is given to the patient	67	83.8%	13	16.3%
Q 29	If the patient has constipation for intestinal problems, fluid intake should be supported and a fibrous diet should be encouraged	70	87.5%	10	12.5%

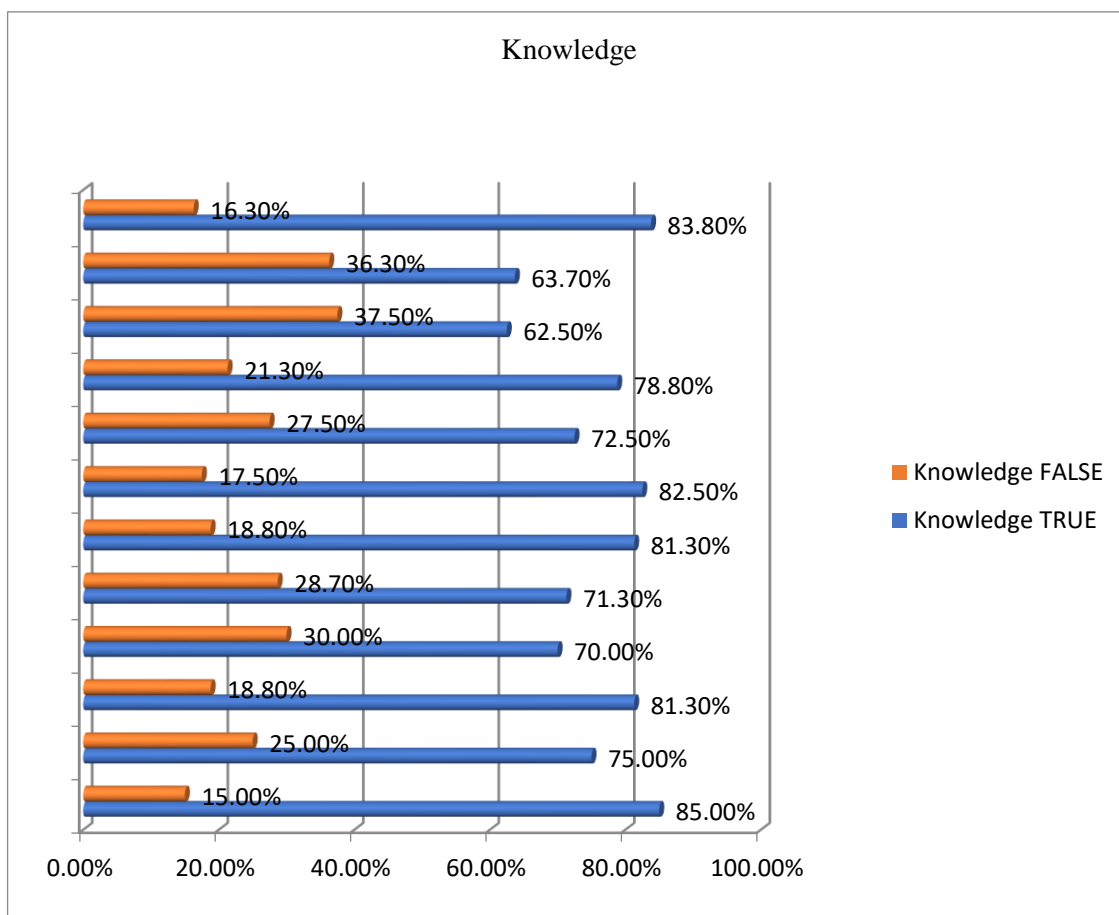


Figure 2.1: Knowledge aspects

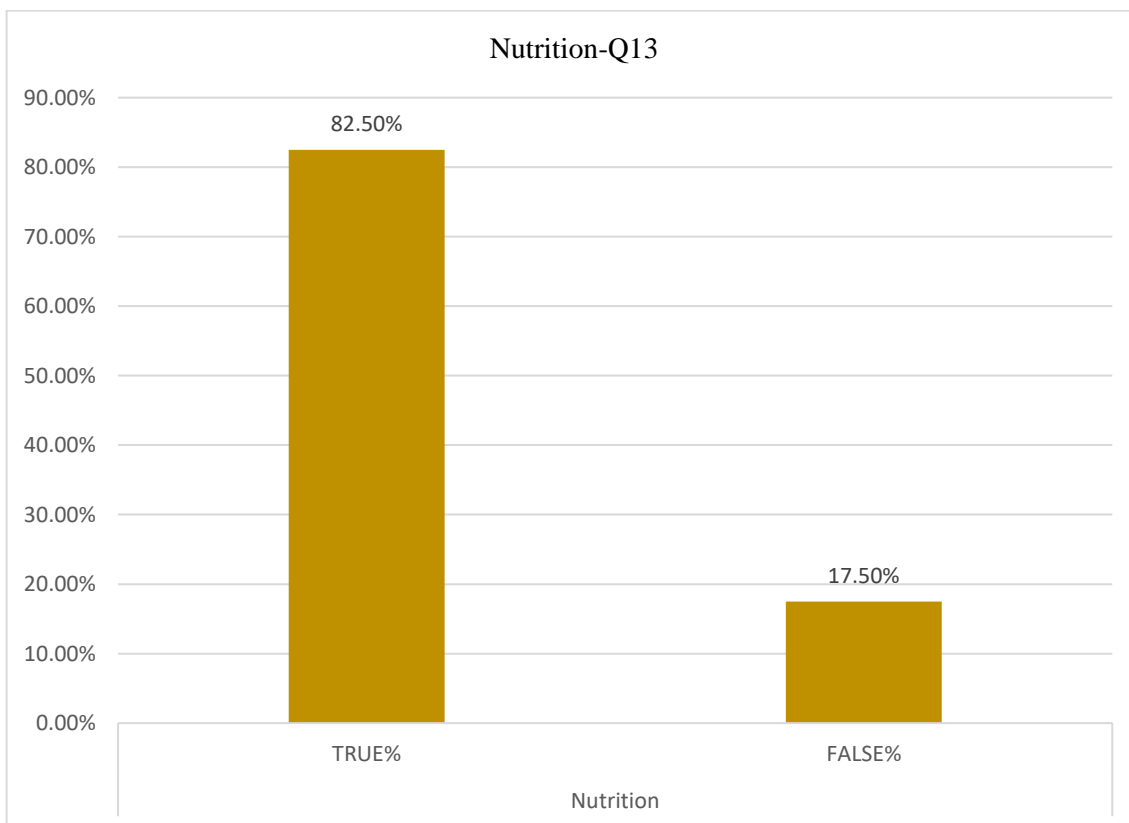


Figure 2.2: Nutrition

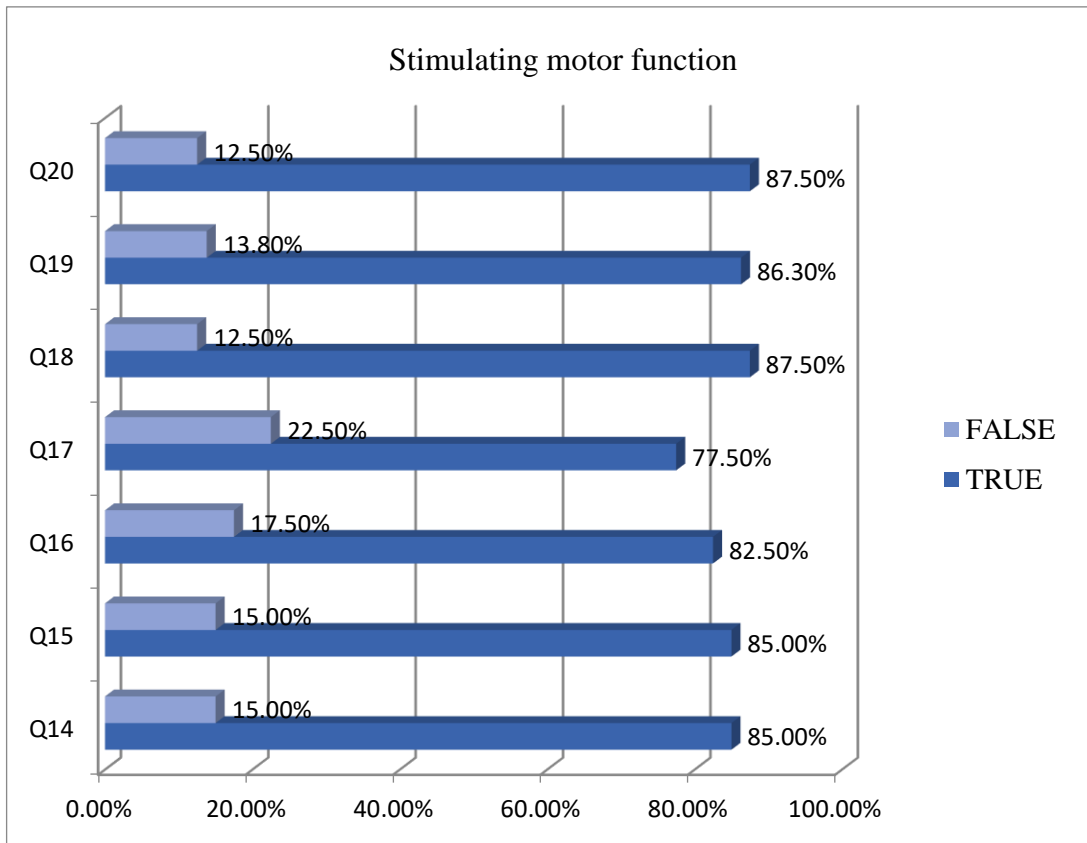


Figure2.3: Stimulating motor function

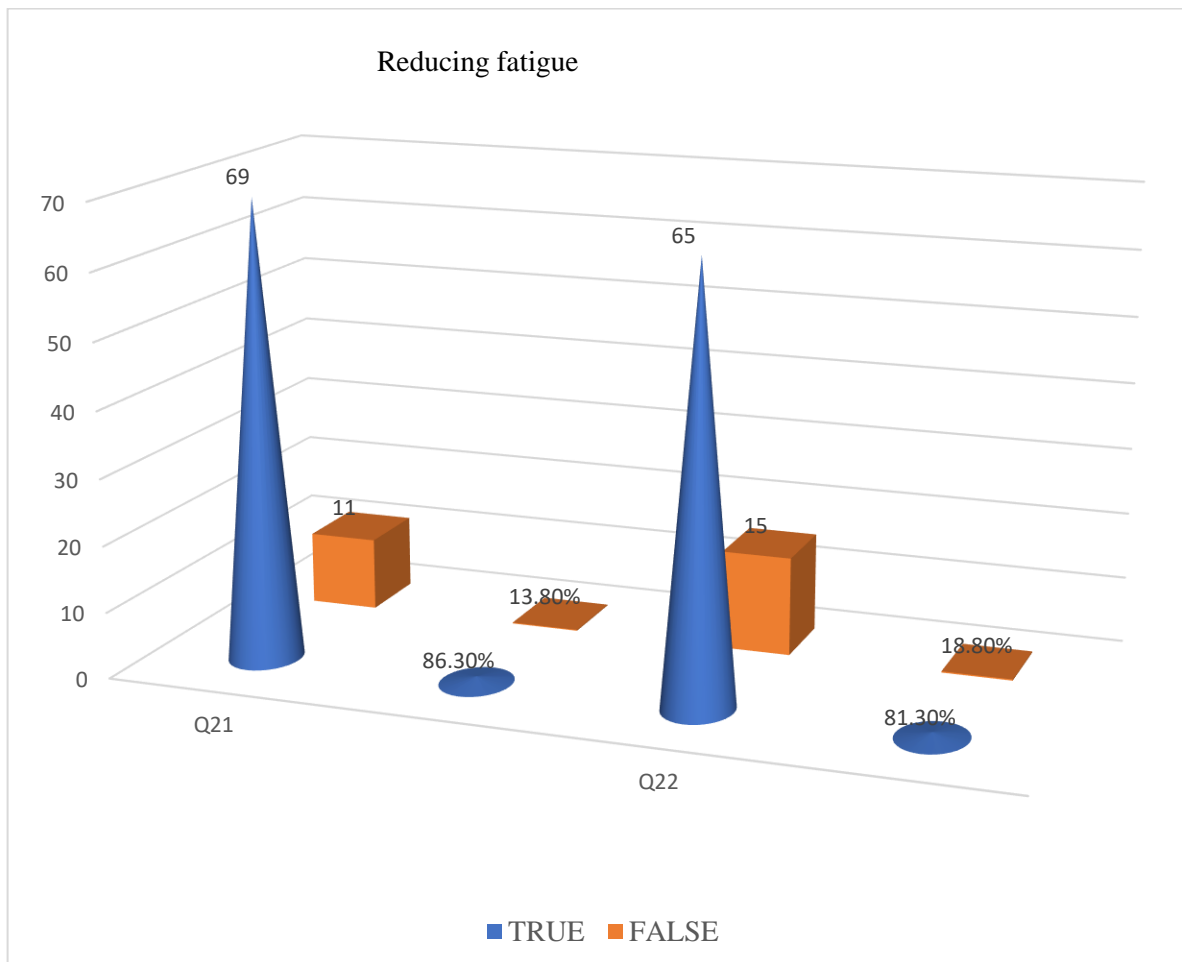


Figure2.4: Reducing fatigue



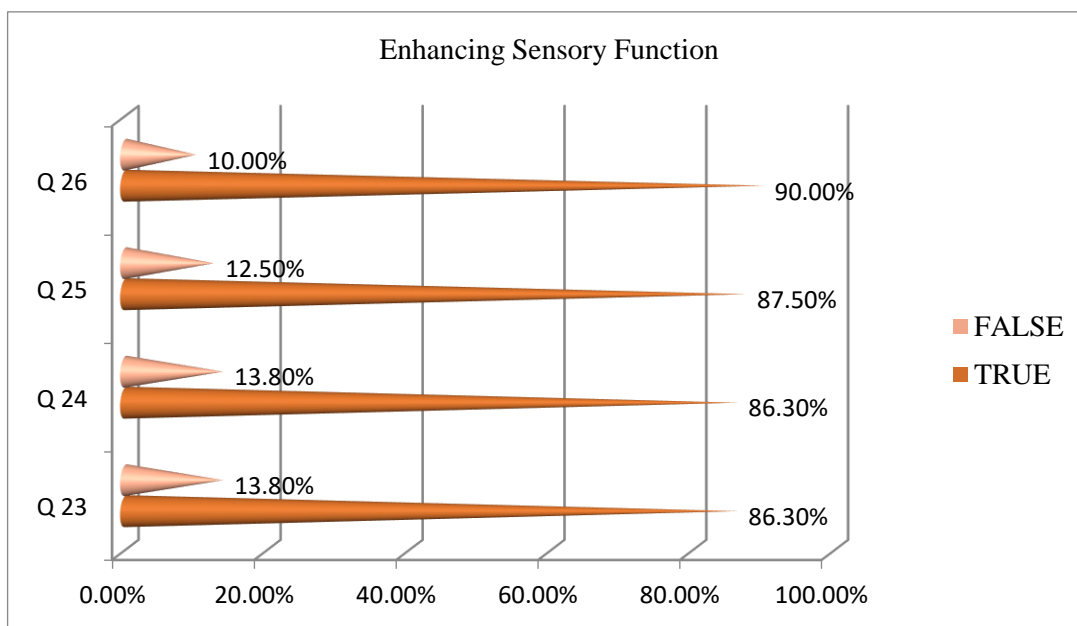


Figure 2.5: Enhance sensory function

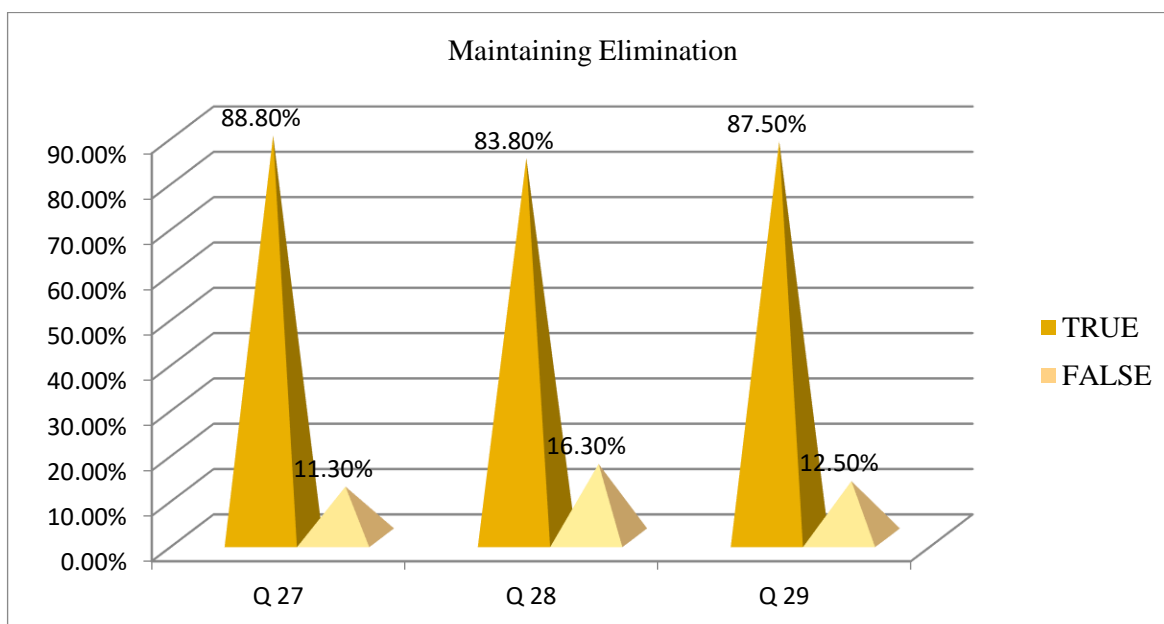


Figure 2.6: Maintaining elimination

Table 2.1/Figure 2.2 to 2.6: - Clearly illustrated the questions regarding care of the patient with multiple sclerosis. The knowledge level of the fourth-year and internship nursing students was above 80% of all except

for Q17. But there was a lack of knowledge (70% and less) in Q4, Q5, Q10, and Q11. The students have less knowledge on the pharmacological management in Q 11 (62.5%) and Q11 (63.7%).

Table-3 -Comparison of Knowledge of multiple sclerosis and its care with its sub criteria for fourth year nursing students and internship nursing students

S. No	Sub criteria	Fourth year students		Internship students	
		Mean	SD	Mean	SD
1	Knowledge	8.8750	3.53871	9.4250	3.19364
2	Nutrition	0.8250	.38481	.8250	.38481
3	Stimulating motor function	5.5500	2.44897	6.4000	1.64551
4	Reducing fatigue	5.5500	2.44897	1.8250	.50064
5	Enhance sensory function	3.4750	1.10911	3.5500	1.17561
6	Maintaining elimination	2.4500	1.06096	2.7500	.74248
	Total	22.7500	8.41168	24.7750	6.78417

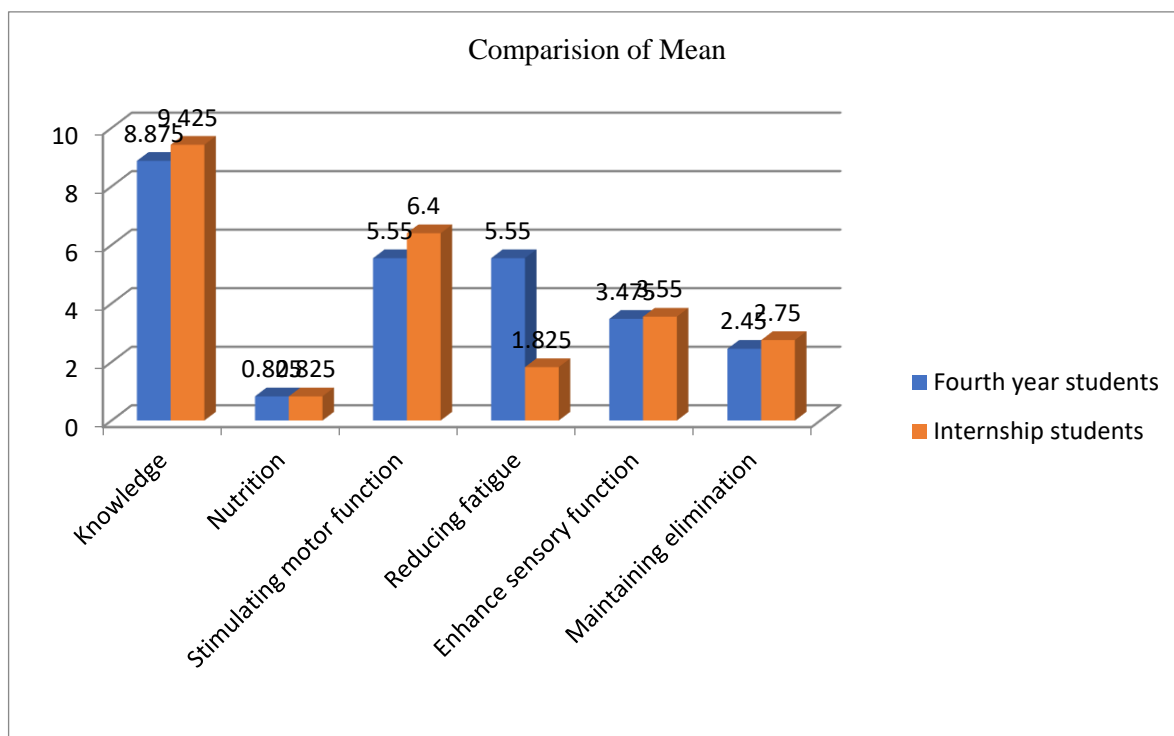


Figure:3-Comparison of mean value for fourth year nursing students and internship nursing students

The above table and figureshows the comparison of means for both fourth-year nursing students and the internship nursing students. This shows the internship students have more knowledge on multiple sclerosis and

its care than the fourth-year students, except in nursing care to reduce the fatigue of the multiple sclerosis patient.

Table-4 Comparison -Overall percentage of Knowledge level of the fourth-year nursing students with internship nursing students on knowledge on multiple sclerosis and its care N=80

S.no	Scale	Level of knowledge	Internship students n=40		Fourth year students n=40	
			Frequency	Percentage	Frequency	Percentage
1	Knowledge questioners	Excellent	35	87.5%	31	77.5%
		Average	3	7.5%	4	10%
		Poor	2	5%	5	12.5%

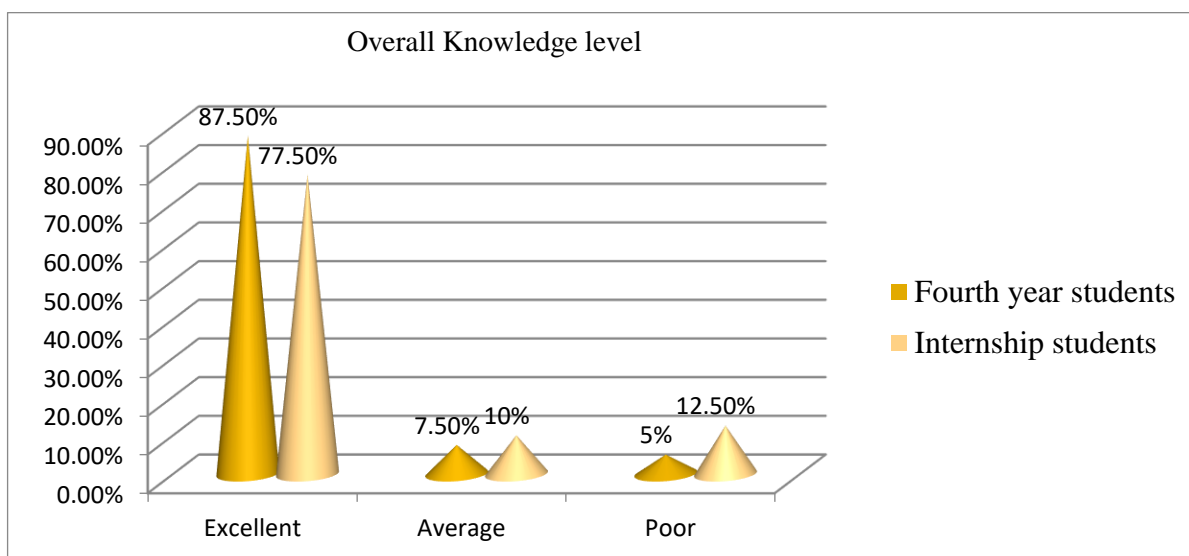


Figure -4 Overall percentage of Knowledge level

Table 4 and figure 4 represents that the internship students level of knowledge was higher (87.5%) than the

fourth-year students level of knowledge on multiple sclerosis and its care.

**Table-5-Association between the demographic variables of the subjects with the total knowledge score of multiple sclerosis and its care N=80**

S.No	Demographic variables	Scale	Chi-square	df	Significance
1	Age	Knowledge questioner	66.175	2	.000
2	Marital status	Knowledge questioner	63.175	2	.000
3	Year of Study	Knowledge questioner	.000	1	1.00
4	Caring for an individual with Multiple Sclerosis during the study period	Knowledge questioner	11.250	1	.001

The above table explains the association between the demographic variables with the study subjects and the knowledge and its care of patients with multiple sclerosis; in this it shows there was no significant association between the demographic variables with the level of knowledge of nursing students on multiple sclerosis and its care.

**Discussion:**

This study was meant to identify the knowledge level of student nurses at Northern Border University, Arar, Saudi Arabia, on multiple sclerosis and its nursing care, in which the student nurses have a moderate level of knowledge and care of how to treat multiple sclerosis patients. This has been stated in the past studies that have been clearly emphasized that the nursing students were lack in their knowledge and training part in taking care during the relapsing symptoms and complications of patients with neurological illness, which includes multiple sclerosis (MS) (McCabe, et al.,2015).The majority of the study participants showed a basic comprehension of multiple sclerosis, properly recognizing important elements such as its pathophysiology, risk factors, and early symptom management therapies (Dobson et al.,2018). Moreover, there were significant gaps detected in such areas that require advanced clinical skills in managing chronic symptoms and administering medicine that were essential for multiple sclerosis patients long-term care (Baker,et al.,2017).

**Comparison between Fourth-year and internship students:**

The comparison of knowledge level of multiple sclerosis and its care between the fourth-year students and internship students: fourth-year students scored 77.5%, whereas internship students with their clinical training experiences demonstrated marginally better levels of knowledge, i.e., 87.5%. The result of this comparison between two groups of student nurses clearly stated that clinical experience improves the knowledge and skills on managing the chronic, long-term neurological illness, including multiple sclerosis (Kluger,et al., 2028). In spite of this benefit, still the internship students revealed knowledge gaps in certain areas, likely specialized

therapeutic interventions and management of chronic symptoms. This result might draw attention to the fact that the existing clinical training has to be strengthened by implementing hands-on experience for the student nurses specifically related to taking care of patients with multiple sclerosis (Morgan,et al., 2020).

**Knowledge level on multiple sclerosis care:**

The studentnurses had shown a significant basic understanding of multiple sclerosis care concepts, which include physical therapy and creating a conducive and safe environment for patients (Diaz-Hernandez & Fields, 2018). But a lack of knowledge level was found in certain domains, such as managing fatigue and managing the elimination needs, which were the core components in delivering holistic care for multiple sclerosis (Kesselring, et al., 2019). These outcomes align with the previous study that stated there was a deficiency of course content regarding the care of chronic illness, especially dealing with multiple sclerosis patients in the nursing curriculum (Nejatian, 2020). Reducing these knowledge gaps will help to improve the student nurse’s confidence and skills while managing the various demands of multiple sclerosis patients.

**Association with Demographic Variables:**

The knowledge level and the demographic variables included in this study were age, marital status, and previous experience in caring for multiple sclerosis patients, which were found to be significantly associated. Previous research articles highlight the importance of improving the theoretical knowledge and clinical training that greatly supports these outcomes (Pakenham et al., 2017). Rieckmann,et al., (2015) suggested that the student nurses who had previous exposure with the multiple sclerosis patients showed significantly higher scores that indicate the hands-on experience has the vital role in the attainment of a higher level of academic knowledge and fostering confidence in managing patients with multiple sclerosis.

**Conclusion:**

The study concluded the effective way to fill the knowledge gap among the student nurses was by improving the multiple sclerosis specific content in the nursing curriculum. Though the internship students showed marginal increases in their knowledge level, it was mainly due to their clinical experience, but there should always be an opportunity to gain knowledge and skill in advanced care procedures and long-term nursing care management to control symptoms of chronic illnesses like multiple sclerosis.

Comprehensive multiple sclerosis focused content should be inculcated inside the nursing program in order to prepare efficient nursing students for multiple sclerosis care. The main elements included in this module should be patient education, psychological support, and practical symptom management (Saposnik et al., 2021). Furthermore, clinical training and simulation-based training might offer huge benefits during the learning experience, which enhance the student nurses competencies, confidence, and skills in caring for a patient with multiple sclerosis (Vollmer, et al., 2018). Implementing these changes into education and practice could eventually result in better patient outcomes; thereby, it enhances the standard quality nursing care that the student nurses and future nurses can provide for patients with multiple sclerosis.

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