

# The Effect of Educational Intervention on Nurses' Knowledge and Challenges in the Management of Autism in Health Facilities in Fako Division of Cameroon

Eyen Werendeng Loveline<sup>1</sup>, Eta Vivian EA<sup>1</sup> Ghislain Dema<sup>2</sup>, Achidi Eric Akum<sup>3</sup>

<sup>1</sup>Department of Nursing, University of Buea, Cameroon

<sup>2</sup>Department of Public Health and Hygiene, University of Buea, Cameroon

<sup>3</sup>Faculty of Science, University of Buea, Cameroon

## Abstract

**Background:** Autism Spectrum Disorder is a complex neurodevelopmental condition characterized by difficulties in social interaction, communication, and repetitive behaviours. The prevalence of autism is rising across Africa including Cameroon, but its knowledge remains limited among nurses.

**Objectives:** This study aimed to assess the current level of nurses' knowledge on autism and evaluate the effect of targeted intervention on nurses' knowledge on autism and challenges faced in its management in health facilities in Fako Division of Cameroon.

**Method:** This was a cross-sectional hospital-based and pretest-posttest single-group interventional study which investigated the effect targeted intervention on nurses' knowledge of autism and challenges faced in its management in health facilities in Fako Division of Cameroon. The study population consisted of nurses who were directly involved in providing nursing care to patients. The study was carried out from 15th October 2024 to 20th July 2025. The participants were 310 nurses who rendered care to patients in health facilities in the Buea, Limbe and Tiko Health Districts in Fako Division, who were selected using probability proportionate to size sampling technique. A multi-stage sampling method was used to select study area and to enroll the participants to the study. The intervention was education on autism that was administered after a pretest during a workshop. A semi-structured questionnaire was used to collect data on knowledge before and after the intervention to compare results. Data was collected from May 13 to June 15, 2025, the data was coded, entered into EPI and analysed using the Statistical Package for Social Sciences version 26. A paired sample t-test was performed to compare the mean scores of the pre- and post- responses. The level of significance was set at  $p < 0.05$ . Open ended questions were analysed using thematic analysis. Results were displayed using pie charts and tables.

**Results:** Baseline assessment revealed that nurses possessed poor knowledge regarding autism, as demonstrated by low mean pre-workshop test scores of 1.81. Following the educational intervention, there was a statistically significant improvement in knowledge levels, with post-test scores of 7.77. The most significant challenge faced by nurses when managing children with autism was communication difficulties as indicated by (306)98.7% of the participants.

**Conclusion:** The targeted educational intervention significantly enhanced nurses' knowledge on autism, leading to improved understanding and recognition of its associated challenges in its management among the participants. The results highlight the effectiveness of the intervention not only in improving factual knowledge, but also in deepening nurses' insight into the multifaceted nature of autism and support available. Therefore, scale up educational workshops to include other healthcare workers such as general practitioners and community health workers, and caregivers across the Fako Division and beyond is mandatory.

**Keywords:** Nurses, knowledge, challenge, autism and Fako Division

**Corresponding Author:** Eta Vivian E.Ayamba, Ph.D., Faculty of Health Sciences, Department of Nursing, University of Buea, BP63 Buea, Cameroon

## INTRODUCTION

According to Eta [1], Autism Spectrum Disorder (ASD) also known as autism is a complex neurodevelopmental condition characterized by difficulties in social interaction, communication, and repetitive behaviours. The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), outlines the diagnostic criteria for ASD, which include deficits in social communication and social interaction across multiple contexts, and restricted, repetitive patterns of behaviour, interests, or activities [1]. The prevalence of autism is increasing globally over the years, with current estimates suggesting that approximately 1 in 54 children are diagnosed with the condition [2].

The global understanding of ASD has evolved significantly since Leo Kanner first described it in 1943 especially in the United State where significant progress has been made in the diagnosis and management of ASD [3]. In Africa, including Cameroon, research on autism has been limited, and the condition is often underdiagnosed and misunderstood [4]. Studies have shown that in Cameroon most healthcare providers, including those in the Fako Division, have limited knowledge about ASD, which may affect their ability to provide adequate care and support to individuals with the condition [5].

In Europe, the National Autistic Society, founded in 1962, has been a key player in advocating for individuals with ASD and providing resources for families and professionals [6]. Similarly, in Australia, the Autism CRC has focused on improving the lives of individuals with ASD through research and collaboration [7]. In Africa for example, in South Africa initiatives like the Autism South Africa organization have been working to raise awareness and provide support services [8].

Eta's study conducted in the Buea and Limbe Regional Hospitals revealed that a significant portion of nurses lacked comprehensive knowledge about autism [9]. Only 24.4% of participants were knowledgeable about ASD, and 97.6% had not attended any seminars or read any information on autism [9]. According to Eta *et al.* [10], there has been limited research on autism, particularly focusing on the knowledge and attitudes of healthcare professionals, including nurses. This indicates a substantial gap in the education and training of nurses regarding autism.

However, the curriculum often lacks comprehensive coverage of developmental disorders, including autism [11]. This lack of training and awareness has been identified as a major barrier to effective diagnosis and management of ASD in the region [12]. These factors influence the perception and management of autism,

often leading to delays in diagnosis and treatment [13], limited access to specialized materials, diagnostic tools, and therapeutic interventions hinders effective autism care [14]. Therefore, efforts should be directed towards improving the quality of care for individuals with ASD and ensure that healthcare professionals are better equipped to manage the condition [15]. By addressing the gaps in knowledge and providing targeted interventions, nurses can better manage autism and offer proper and adequate care to patients with ASD [10].

Previous studies have demonstrated the positive impact of targeted educational interventions on healthcare professionals' knowledge and attitudes towards autism [16]. This study aims to evaluate the current level of nurses' knowledge on autism, identify the challenges they face in managing the disorder, and evaluate the effect of targeted interventions on their knowledge and skills. Targeted interventions—such as structured workshops, seminars, and curriculum enhancements—have emerged as promising strategies to bridge this knowledge gap. These interventions aim not only to improve factual understanding of autism but also to foster more empathetic attitudes and clinical confidence among nurses. By focusing on health facilities in Fako Division, this study explores the transformative impact of targeted educational initiatives on nurses' knowledge of autism. The findings are expected to inform policy and practice, ultimately contributing to more inclusive and effective healthcare delivery for individuals with ASD in Cameroon.

## METHODOLOGY

This was cross-sectional hospital-based and pretest-posttest single-group interventional study which investigated the effect targeted intervention on nurses' knowledge of autism and challenges faced in its management in health facilities in Fako Division of Cameroon. Fako Division is one of the six administrative divisions of the South West Region of Cameroon. It has four health districts sparsely distributed within the division with the leading District Health Services being the Limbe District health service, Buea Health District, Tiko Health District and Muyuka Health District. Each health district having health areas encompasses nurses from a wide range of specialties and settings, such as hospitals, clinics, and community health centers both public and private. Fako division covers an area of approximately 2,093 square kilometres and has a population of around 466,412 people as of the 2005 census. It is home to a mix of urban, peri-urban, and rural communities, with a population composed of various ethnic groups, including the Bakweri, Bafaw, Balong, and a growing number of internal migrants from across Cameroon and neighboring countries.

The study population consisted of nurses who were directly involved in providing nursing care to patients. The study was carried out from 5<sup>th</sup> January, 2025 to 15<sup>th</sup> July, 2025. The participants were 310 nurses who rendered

care to patients in health facilities in the Buea of the Tiko and Limbe Health Districts in Fako Division, who were selected using probability proportionate to size sampling technique (Table 1).

**Table1: Study Sample**

| Health District       | Number of Nurses |
|-----------------------|------------------|
| Buea Health District  | 120              |
| Limbe Health District | 140              |
| Tiko Health District  | 50               |
| <b>Total</b>          | <b>310</b>       |

A multi-stage sampling method was used to select study area and to enroll the participants to the study. The intervention was education on autism that was administered after a pretest during a workshop. A semi-structured questionnaire was used to collect data on knowledge before and after the intervention to compare results. Scores were categorized using Bloom's taxonomy (recall, comprehension, application) and summarized as means ( $\pm$ SD) and frequencies. Knowledge levels were classified as poor (<60%) or good (>60%). Before administering the questionnaire, it was pretested in the Littoral Region using 10 nurses directly involved in the care of patient, some questions were rephrased after the pre-test. All participants gave written concern before completing the questionnaire.

Data was collected from March 15 to June 15, 2025, the data collected was coded and entered into EPI. Data was analysed using the Statistical Package for Social Sciences version 26.0; the descriptive and inferential statistics were used appropriately to enter raw data prior to analysis. The demographic data were presented on frequency table using numbers and percentages. Chi-square tests examined associations between knowledge levels and other variables Chi-tests identified associations between challenges and workshop settings or experience level. A

paired sample t-test was performed to compare the mean scores of the pre- and post-test responses. The level of significance was set at  $p < 0.05$ . Open ended questions were analysed using thematic analysis where responses were grouped into major themes. Results were displayed using pie charts and tables.

## RESULTS

A total of 310 nurses participated in the study and females made up 72.6% of the participants. The mean ( $\pm$ SD) age of participants was 37 years ( $\pm 10.7$ ), with the largest age groups being 20–33 years (39%) and 34–46 years. Most nurses had a Diploma (60.3%) in nursing. The majority were married (71.6%). In terms of professional experience, 62.3% had 6–10 years of nursing experience, while 16.5% had over 10 years. A smaller proportion had 2–5 years (11%) and less than 2 years (10.3%) of experience. Participants were drawn from various health institutions, with the highest representation from private hospitals (43.2%), followed by government facilities (38.4%) and missionary hospitals (18.4%). Geographically, nurses were nearly evenly distributed across the Buea (32.9%), Limbe (34.8%), and Tiko (32.3%) Health Districts. Most nurses had a Diploma (60.3%) in nursing. The majority were married (71.6%). (Tables 2a and 2b).

**Table 2a: Distribution of Sociodemographic Attributes Among Nurses in Fako Division**

| Variable                  | Category          | n (%)            |  |
|---------------------------|-------------------|------------------|--|
| <b>Gender</b>             | Female            | 225/72.6         |  |
|                           | Male              | 85 (27.4)        |  |
|                           | <b>Total</b>      | <b>310 (100)</b> |  |
| <b>Age group (years)</b>  | 20-33             | 121 (39)         |  |
|                           | 34-46             | 116 (37.4)       |  |
|                           | 47-60             | 73 (23.5)        |  |
|                           | <b>Total</b>      | <b>310 (100)</b> |  |
| <b>Level of education</b> | Bachelor's Degree | 43 (13.9)        |  |
|                           | Diploma           | 187 (60.3)       |  |
|                           | Master's Degree   | 80 (25.8)        |  |
|                           | <b>Total</b>      | <b>310 (100)</b> |  |

|                       |              |                  |  |
|-----------------------|--------------|------------------|--|
| <b>Marital status</b> | Married      | 222 (71.6)       |  |
|                       | Single       | 88 (28.4)        |  |
|                       | <b>Total</b> | <b>310 (100)</b> |  |

In terms of professional experience, 62.3% participants had 6–10 years of nursing experience, while 16.5% had over 10 years. A smaller proportion of the respondents had 2–5 years (11%) or less than 2 years (10.3%) of experience. Participants were drawn from various health institutions, with the highest representation from private hospitals (43.2%), followed by government facilities (38.4%) and missionary hospitals (18.4%). Geographically, nurses were nearly evenly distributed across the Buea (32.9%), Limbe (34.8%), and Tiko (32.3%) Health Districts (Table 2b).

**Table 2b:** *Distribution of Sociodemographic Attributes Among Nurses in Fako Division*

| <b>Variable</b>                      | <b>Category</b> | <b>n (%)</b>     |  |
|--------------------------------------|-----------------|------------------|--|
| <b>Year of experience as a Nurse</b> | >10             | 51 (16.5)        |  |
|                                      | 2-5             | 34 (11)          |  |
|                                      | 6-10            | 193 (62.3)       |  |
|                                      | <2              | 32 (10.3)        |  |
|                                      | <b>Total</b>    | <b>310 (100)</b> |  |
| <b>Health institution</b>            | Government      | 119 (38.4)       |  |
|                                      | Missionary      | 57 (18.4)        |  |
|                                      | Private         | 134 (43.2)       |  |
|                                      | <b>Total</b>    | <b>310 (100)</b> |  |
| <b>Health district</b>               | Buea            | 102 (32.9)       |  |
|                                      | Limbe           | 108 (34.8)       |  |
|                                      | Tiko            | 100 (32.3)       |  |
|                                      | <b>Total</b>    | <b>310 (100)</b> |  |

A striking 82.3% of nurses reported never receiving any formal training on ASD. Regarding their basic knowledge of ASD, 62.3% incorrectly identified ASD as a mental illness. 43.2% correctly identified social interaction and communication difficulties as primary effects of ASD. Majority of the participants, 59.7% incorrectly stated that “sudden recovery from symptoms” was a characteristic of ASD, and only 3.2% recognized that difficulty with social interactions is a core trait of ASD. The perceived causes of

ASD were widely misunderstood where 48.7% believed it was caused by contagious infections. Most nurses (70%) incorrectly thought ASD signs typically appear in adolescence. Regarding management, 74.5% wrongly believed isolation from social interaction was appropriate. Diagnostic misconceptions were also common, 63.2% thought ASD was diagnosed via X-rays. Finally, 59% incorrectly stated that ASD always leads to intellectual disability (Table 3a & 3b).

**Table3a:** *Frequency Distribution of Nurses' Current Knowledge on Autism Spectrum Disorder in Fako Division*

| <b>Variable</b>                                                  | <b>Category</b>        | <b>n(%)</b>      |  |
|------------------------------------------------------------------|------------------------|------------------|--|
| <b>Have received formal training on autism spectrum disorder</b> | No                     | 255 (82.3)       |  |
|                                                                  | Yes                    | 55 (17.7)        |  |
|                                                                  | <b>Total</b>           | <b>310 (100)</b> |  |
| <b>Definition of autism spectrum disorder (ASD)</b>              | A development disorder | 86 (27.7)        |  |
|                                                                  | A mental illness       | 193 (62.3)       |  |
|                                                                  | An infectious disease  | 31 (10)          |  |
|                                                                  | <b>Total</b>           | <b>310 (100)</b> |  |

|                                                  |                                      |                  |  |
|--------------------------------------------------|--------------------------------------|------------------|--|
| <b>ASD primarily affects</b>                     | Muscle function                      | 102 (32.9)       |  |
|                                                  | Social interaction and communication | 134 (43.2)       |  |
|                                                  | vision and hearing                   | 74 (23.9)        |  |
|                                                  | <b>Total</b>                         | <b>310 (100)</b> |  |
| <b>It is not a characteristic of ASD</b>         | Difficulty with social interactions  | 10 (3.2)         |  |
|                                                  | Repetitive behaviors                 | 115 (37.1)       |  |
|                                                  | Sudden recovery from symptoms        | 185 (59.7)       |  |
|                                                  | <b>Total</b>                         | <b>310 (100)</b> |  |
| <b>ASD is primarily caused by</b>                | contagious infection                 | 151 (48.7)       |  |
|                                                  | genetic and environmental factors    | 13 (4.2)         |  |
|                                                  | poor parenting                       | 146 (47.1)       |  |
|                                                  | <b>Total</b>                         | <b>310 (100)</b> |  |
| <b>Early signs of ASD are typically observed</b> | Adolescence                          | 217 (70)         |  |
|                                                  | Before age 3                         | 37 (11.9)        |  |
|                                                  | Between 7-10 years                   | 56 (18.1)        |  |
|                                                  | <b>Total</b>                         | <b>310 (100)</b> |  |

**Table 3b:** Frequency Distribution of Current Level of Nurses' Knowledge on Autism Spectrum Disorder in Fako Division

| Variable                         | Category                                                        | n (%)            |  |
|----------------------------------|-----------------------------------------------------------------|------------------|--|
| <b>ASD could be managed</b>      | Antibiotics                                                     | 48 (15.5)        |  |
|                                  | Isolation from social interactions                              | 231 (74.5)       |  |
|                                  | Specialized education programs, therapy, and early intervention | 31 (10)          |  |
|                                  | <b>Total</b>                                                    | <b>310 (100)</b> |  |
| <b>ASD is diagnosed based on</b> | Behavioral observation and developmental screenings             | 62 (20)          |  |
|                                  | Blood tests                                                     | 52 (16.8)        |  |
|                                  | X-rays                                                          | 196 (63.2)       |  |
|                                  | <b>Total</b>                                                    | <b>310 (100)</b> |  |
| <b>This is true about ASD</b>    | It always leads to intellectual disability                      | 183 (59)         |  |
|                                  | It is a live long condition                                     | 13 (4.2)         |  |
|                                  | It only affects boys                                            | 114 (36.8)       |  |
|                                  | <b>Total</b>                                                    | <b>310(100)</b>  |  |

With respect to whether the level of nurses' knowledge was poor or good, figure 1 shows a significant deficit in ASD knowledge among the nurses. Only 18.1% demonstrated good understanding of autism spectrum disorder, while the vast majority (81.9%) showed poor knowledge levels.

The distribution of participant's knowledge levels across different age groups showed that among those aged 20-33, 14(4.5%) participants demonstrated good knowledge of ASD, while 107 (34.5%) had poor knowledge. In the 34-46 age group, 17 (14.7%) participants showed good understanding, compared to 99 (31.9%) with poor knowledge. The oldest age group, 47-60, had 25 (8.1%) nurses with good knowledge and 48 (15.5%) with poor

knowledge. Overall, it appears that the proportion of good knowledge increased slightly with age, although the majority in each group still demonstrated poor understanding (Figure 2)

Results of level of nurses' knowledge with respect to years of experience showed that nurses with more than 10 years of experience, 25 (49%) demonstrated good knowledge of ASD. Among those with 2-5 years of experience, 33 (97.1%) had poor knowledge. In the 6-10 years' experience category, 163 (84.5) had poor knowledge. Notably, the nurses with less than 2 years of experience all 32 (100%) in this group showed poor knowledge (Figure 3 ).

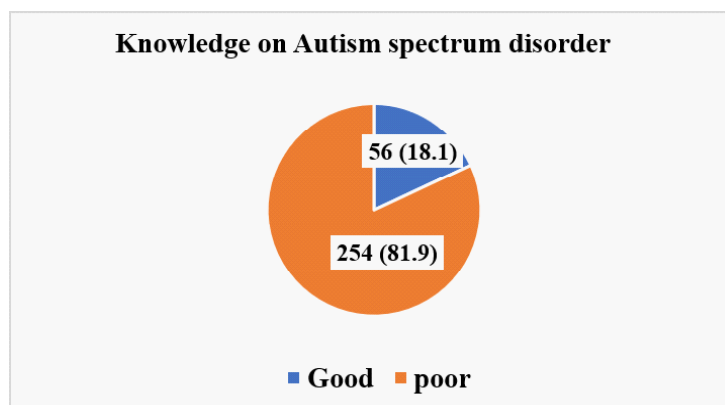


**Fig1:** Distribution of Overall Knowledge on Autism Spectrum Disorder Among Nurses in Fako Division

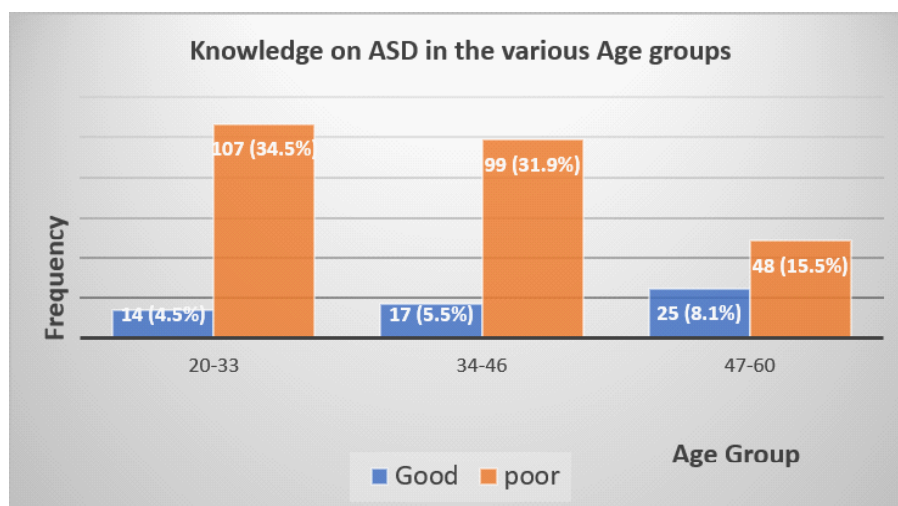


**Fig2:** Frequency Distribution on Overall Level of Nurses' Knowledge Across Different Age Groups in Fako Division

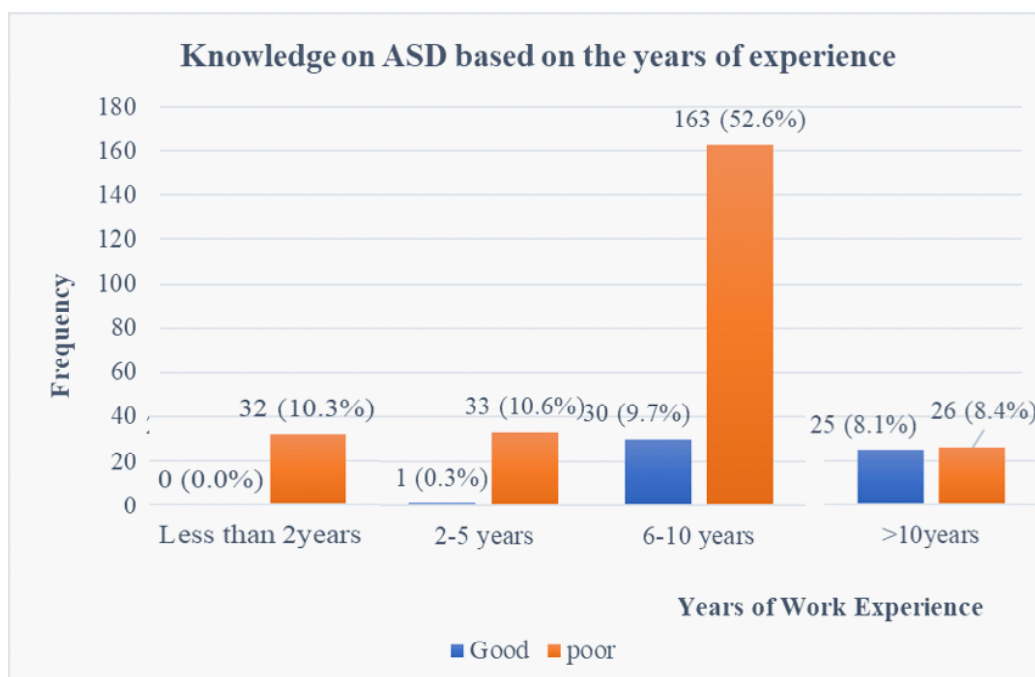


**Fig3:** Frequency Distribution of Nurses' Knowledge on Autism Spectrum Disorder Based on Years of Work Experience in Fako Division

In addition, the study showed significant associations between nurses' knowledge of ASD and several sociodemographic variables ( $p < 0.05$ ). Age demonstrated a strong relationship with ASD knowledge ( $\chi^2 = 17.274$ ,  $p < 0.001$ ), with nurses aged 47-60 years showing markedly good knowledge (34.2%) compared to younger colleagues (11.6-14.7%). Marital status was significantly associated with knowledge ( $\chi^2 = 8.884$ ,  $p = 0.003$ ), as single nurses exhibited higher knowledge levels (28.4%) than their married counterparts (14.0%). Educational attainment showed the strongest association ( $\chi^2 = 104.51$ ,  $p < 0.001$ ); nurses with Bachelor's (41.9%) and Master's Degrees (47.5%) demonstrated substantially better knowledge

than diploma holders (0%). Professional experience was similarly significant ( $\chi^2 = 46.154$ ,  $p < 0.001$ ), with the most experienced nurses (>10 years) showing the highest knowledge levels (49.0%), while those with less than 2 years' experience had uniformly poor knowledge (0%). Geographic location also significantly influenced knowledge ( $\chi^2 = 17.161$ ,  $p < 0.001$ ), with Buea District nurses performing best (29.4%) compared to Limbe (17.6%) and Tiko (7.0%). Notably, gender ( $\chi^2 = 0.201$ ,  $p = 0.654$ ) and health institution type ( $\chi^2 = 4.109$ ,  $p = 0.128$ ) showed no statistically significant associations with ASD knowledge levels (Table 4a and 4b).

**Table 4a:** Association of Knowledge on Autism Spectrum Disorder with Sociodemographic Variations among Nurses in Fako Division

| Variable                | Category          | Knowledge on ASD  |                    | Chi-Square | p-value |
|-------------------------|-------------------|-------------------|--------------------|------------|---------|
|                         |                   | Good              | Poor               |            |         |
| Gender                  | Female            | 42 (18.70)        | 183 (81.30)        | 0.201      | 0.654   |
|                         | Male              | 14 (16.50)        | 71 (83.50)         |            |         |
|                         | <b>Total</b>      | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |
| Age Group (Years)       | 20-33             | 14 (11.60)        | 107 (88.40)        | 17.274     | <0.001  |
|                         | 34-46             | 17 (14.70)        | 99 (85.30)         |            |         |
|                         | 47-60             | 25 (34.20)        | 48 (65.80)         |            |         |
|                         | <b>Total</b>      | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |
| Marital Status          | Married           | 31 (14.00)        | 191 (86.00)        | 8.884      | 0.003   |
|                         | Single            | 25 (28.40)        | 63 (71.60)         |            |         |
|                         | <b>Total</b>      | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |
| Highest Education Level | Bachelor's Degree | 18 (41.90)        | 25 (58.10)         | 104.51     | <0.001  |
|                         | Diploma           | 0 (0.00)          | 187 (100.00)       |            |         |
|                         | Master's Degree   | 38 (47.50)        | 42 (52.50)         |            |         |
|                         | <b>Total</b>      | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |
| Years of Experience     | >10 years         | 25 (49.00)        | 26 (51.00)         | 46.154     | <0.001  |
|                         | 2-5 years         | 1 (2.90)          | 33 (97.10)         |            |         |
|                         | 6-10 years        | 30 (15.50)        | 163 (84.50)        |            |         |
|                         | Less than 2 years | 0 (0.00)          | 32 (100.00)        |            |         |
|                         | <b>Total</b>      | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |

**Table 4b:** Association of Knowledge on Autism Spectrum Disorder with Sociodemographic Variations among Nurses in Fako Division

| Variable           | Category     | Knowledge on ASD  |                    | Chi-Square | p-value |
|--------------------|--------------|-------------------|--------------------|------------|---------|
|                    |              | Good              | Poor               |            |         |
| Health Institution | Government   | 17 (14.40)        | 101 (85.60)        | 4.109      | 0.128   |
|                    | Missionary   | 8 (13.80)         | 50 (86.20)         |            |         |
|                    | Private      | 31 (23.10)        | 103 (76.90)        |            |         |
|                    | <b>Total</b> | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |
| Health District    | Buea         | 30 (29.40)        | 72 (70.60)         | 17.161     | <0.001  |
|                    | Limbe        | 19 (17.60)        | 89 (82.40)         |            |         |
|                    | Tiko         | 7 (7.00)          | 93 (93.00)         |            |         |
|                    | <b>Total</b> | <b>56 (18.10)</b> | <b>254 (81.90)</b> |            |         |

The major challenge nurses faced when managing children with ASD was communication difficulties with parents at 107(34.5%). Regarding measures that helped in managing ASD symptoms, 158 (51%) reported sudden strict discipline, and 195 (62.9%) of the participants said

the role of early intervention in managing ASD significantly improves developmental outcomes. Another challenge mentioned was lack of resources, 90 (29%) as shown in Table 5).

**Table 5: Frequency Distribution of Challenges Faced by Nurses in Managing Autism Spectrum Disorder in Fako Division**

| Variable                                                       | Category                                                                  | n (%)            |
|----------------------------------------------------------------|---------------------------------------------------------------------------|------------------|
| <b>Challenge nurses faced managing ASD</b>                     | Communication difficulties with parents                                   | 107 (34.5)       |
|                                                                | Easily predictable behavior                                               | 170 (54.8)       |
|                                                                | No need for specialized care                                              | 33 (10.6)        |
|                                                                | <b>Total</b>                                                              | <b>310 (100)</b> |
| <b>Management of ASD symptoms</b>                              | Aspirin                                                                   | 91 (29.7)        |
|                                                                | Behavior therapy                                                          | 61 (19.7)        |
|                                                                | Sudden strict discipline                                                  | 158 (51)         |
|                                                                | <b>Total</b>                                                              | <b>310 (100)</b> |
| <b>Importance of early intervention in managing ASD</b>        | It has no effect                                                          | 53 (17.1)        |
|                                                                | It significantly improves developmental outcomes                          | 195 (62.9)       |
|                                                                | It worsens symptoms                                                       | 62 (20)          |
|                                                                | <b>Total</b>                                                              | <b>310 (100)</b> |
| <b>Effect of sensory sensitivities in individuals with ASD</b> | Sensory issues only occur in adulthood                                    | 134 (43.2)       |
|                                                                | They have no sensory difficulties                                         | 115 (37.1)       |
|                                                                | They may be overly sensitive or indifferent to sounds, textures or lights | 61 (19.7)        |
|                                                                | <b>Total</b>                                                              | <b>310 (100)</b> |
| <b>Challenges in faced</b>                                     | Difficulty in communication                                               | 37 (11.9)        |
|                                                                | Immediate symptoms relief with medication                                 | 183 (59)         |
|                                                                | Lack of resources                                                         | 90 (29)          |
|                                                                | <b>Total</b>                                                              | <b>310 (100)</b> |

Communication difficulties with parents emerged as a major challenge ( $\chi^2=15.808$ ,  $p<0.001$ ), with only 13 nurses recognizing this issue. Regarding behavioral management, 127 nurses incorrectly viewed ASD behaviors as easily predictable. Concerning treatment approaches, a striking 157 nurses erroneously believed sudden strict discipline helps manage ASD symptoms ( $\chi^2=77.78$ ,  $p<0.001$ ). Similarly, 66 nurses inappropriately recommended aspirin for symptom management. Early intervention knowledge showed significant gaps ( $\chi^2=55.175$ ,  $p<0.001$ ): 182

nurses incorrectly believed it has no effect on outcomes, and sensory sensitivity understanding was particularly deficient ( $\chi^2=54.056$ ,  $p<0.001$ ), with 133 nurses mistakenly thinking sensory issues only emerge in adulthood and 73 denying their existence altogether. Practical challenges included 157 nurses expecting immediate symptom relief through medication ( $\chi^2=9.165$ ,  $p=0.01$ ), while only 24 acknowledged communication difficulties as a primary challenge. Limited resources were identified by 73 nurses (Table 6).

**Table 6: Associations in Autism Management Challenges Among Nurses in Fako Division**

|                                           | Category                                | No         | Yes       | Chi-Square | p-value |
|-------------------------------------------|-----------------------------------------|------------|-----------|------------|---------|
| <b>Challenge nurses face managing ASD</b> | Communication difficulties with parents | 94         | 13        | 15.808     | <0.001  |
|                                           | Easily predictable behavior             | 127        | 43        |            |         |
|                                           | No need for specialized care            | 33         | 0         |            |         |
|                                           | <b>Total</b>                            | <b>254</b> | <b>56</b> |            |         |

|                                                         |                                               |            |           |        |        |
|---------------------------------------------------------|-----------------------------------------------|------------|-----------|--------|--------|
| <b>Management of ASD Symptoms</b>                       | Aspirin                                       | 66         | 25        | 77.78  | <0.001 |
|                                                         | Behavior therapy                              | 31         | 30        |        |        |
|                                                         | Sudden strict discipline                      | 157        | 1         |        |        |
|                                                         | <b>Total</b>                                  | <b>254</b> | <b>56</b> |        |        |
| <b>Importance of Intervention in Managing ASD</b>       | It has no effect                              | 27         | 26        | 55.175 | <0.001 |
|                                                         | Significantly improves outcomes               | 182        | 13        |        |        |
|                                                         | Worsens symptoms                              | 45         | 17        |        |        |
|                                                         | <b>Total</b>                                  | <b>254</b> | <b>56</b> |        |        |
| <b>Sensory Sensitivity effect on ASD individual</b>     | Sensory issues only occur in adulthood        | 133        | 1         | 54.056 | <0.001 |
|                                                         | No sensory difficulties                       | 73         | 42        |        |        |
|                                                         | Over/indifference to sounds, textures, lights | 48         | 13        |        |        |
|                                                         | <b>Total</b>                                  | <b>254</b> | <b>56</b> |        |        |
| <b>Nurses' challenges in handling Children with ASD</b> | Difficulty in communication                   | 24         | 13        | 9.165  | 0.01   |
|                                                         | Immediate symptoms relief with medication     | 157        | 26        |        |        |
|                                                         | Lack of resources                             | 73         | 17        |        |        |
|                                                         | <b>Total</b>                                  | <b>254</b> | <b>56</b> |        |        |

One hundred and sixty (51.6%) of the participants indicated that lack of training and education are Support or resources necessary for nurses to effectively manage autistic patients as could be deduced from the statement, *"I have never received training on autism in nursing school; we need workshops to understand how to identify autism"*. One hundred and five respondents (33.9%) respondents said nurses need Diagnostic Tools as mentioned, *"We do not have tools to diagnose autism"*. Forty-five respondents (14.5%) mentioned that Community and Family Support Services are necessary, as stated *"Families need counselling and help from social services"*. The nurses reported that major challenges in managing autism in Fako Division is cultural beliefs, 120 (38.7%) and stigma 102 (32.9%) as stated, *"Some people think autism is witchcraft"* and *"Parent hide autistic children out of shame"* respectively. Also, inadequate policy and government support, 102 (32.9%) was reported as stated, *"There are no guidelines for autism care in the hospitals"*, while 88 (28.4%) reported lack of

interdisciplinary collaboration as mentioned, *"We need psychologists and special educators"*.

After the educational intervention, 298(96.1%) of the nurses correctly identified autism as a developmental disorder. When asked about the core symptoms of ASD all participants, 310 (100%) said deficit in social interaction and communication. The primary cause of ASD was attributed to genetic and environmental factors by 302 (97.4%) of participants. Early signs of ASD are typically observed before the age of 3, as reported by 306 (98.7%) of the participants. Management of ASD was largely associated with specialized educational programs, therapy, and early intervention, as indicated by 302(97.4%) of the participants. When asked about diagnosis, 306 (98.7%) correctly identified behavioral observations and developmental screenings as the basis for ASD diagnosis. Finally, most participants 292 (94.2%) recognized that ASD is a lifelong condition (Table 7).

**Table 7.** Frequency Distribution of Nurses on Knowledge and Challenges Faced in Managing Autism Spectron Disorder Post Training in Fako Division

| Training Items                                      | Category                             | n (%)            |
|-----------------------------------------------------|--------------------------------------|------------------|
| <b>Definition of autism spectrum disorder (ASD)</b> | A development disorder               | 298 (96.1)       |
|                                                     | A mental illness                     | 12 (3.9)         |
|                                                     | <b>Total</b>                         | <b>310 (100)</b> |
|                                                     | Social interaction and communication | 310 (100)        |

|                                        |                                                                   |                  |
|----------------------------------------|-------------------------------------------------------------------|------------------|
| <b>NOT a characteristic of ASD</b>     | Difficulty with social interaction                                | 14 (4.5)         |
|                                        | Sudden recovery from symptoms                                     | 296 (95.5)       |
|                                        | <b>Total</b>                                                      | <b>310 (100)</b> |
| <b>Primary cause of ASD</b>            | Genetic and environmental factors                                 | 302 (97.4)       |
|                                        | Poor parenting                                                    | 8 (2.6)          |
|                                        | <b>Total</b>                                                      | <b>310 (100)</b> |
| <b>Signs of ASD typically observed</b> | Before age 3                                                      | 306 (98.7)       |
|                                        | Between 7-10 years                                                | 4 (1.3)          |
|                                        | <b>Total</b>                                                      | <b>310 (100)</b> |
| <b>Management of ASD</b>               | Antibiotics                                                       | 4 (1.3)          |
|                                        | Isolation from social interaction                                 | 4 (1.3)          |
|                                        | Specialized educational programs, therapy, and early intervention | 302 (97.4)       |
|                                        | <b>Total</b>                                                      | <b>310 (100)</b> |
| <b>ASD is diagnosed by</b>             | Behavioral observations and developmental screenings              | 306 (98.7)       |
|                                        | X-rays                                                            | 4 (1.3)          |
|                                        | <b>Total</b>                                                      | <b>310 (100)</b> |
| <b>About ASD</b>                       | It always leads to intellectual disability                        | 18 (5.8)         |
|                                        | It is a lifelong condition                                        | 292 (94.2)       |
|                                        | <b>Total</b>                                                      | <b>310 (100)</b> |

Overall knowledge after intervention, the results participants with 302 (97.4%) classified as having “good demonstrated a predominantly positive response among knowledge” (Figure 4).

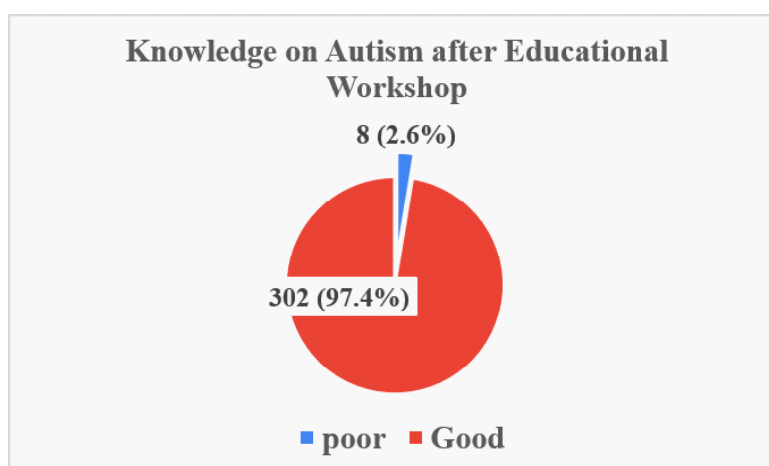


**Figure 4:** Overall Nurses' Knowledge on Autism Spectrum Disorder Following Educational Workshop

A paired samples test was conducted to assess the change in knowledge about ASD before (Mean =  $1.81 \pm 1.615$ ) and after the intervention (Mean =  $7.77 \pm 0.659$ ). The results indicated a significant increase in knowledge scores post-intervention, with a mean difference of 5.968 points (Standard Deviation = 1.771). The 95% confidence interval

for this difference ranged from 5.77 to 6.166, suggesting a consistent improvement across participants. The t-value was 59.314, and the associated p-value was less than 0.001, indicating that the increase in knowledge after the intervention was statistically significant (Table 8).

**Table 8:** Mean Scores of Nurses' Knowledge on Autism Spectrum Disorder Before and After Educational Workshop in Fako Division

| Variable                      | Mean | Standard deviation |
|-------------------------------|------|--------------------|
| Knowledge Before intervention | 1.81 | 1.615              |
| knowledge after intervention  | 7.77 | 0.659              |

Table 9 shows the paired sample test of nurses' knowledge.

**Table 9: Paired Sample T-Test Results of Nurses' Knowledge on Autism Spectrum Disorder in Fako Division**

| Paired Samples Test                             |       |                |                                           |       |        |         |
|-------------------------------------------------|-------|----------------|-------------------------------------------|-------|--------|---------|
| Paired Differences                              | Mean  | Std. Deviation | 95% Confidence Interval of the Difference |       | T      | p-value |
|                                                 |       |                | Lower                                     | Upper |        |         |
| Knowledge After - knowledge before intervention | 5.968 | 1.771          | 5.77                                      | 6.166 | 59.314 | <0.001  |

Knowledge with respect to years of work experience after intervention revealed variations in outcomes based on the duration of experience among participants. The age group 6 to 10 years of work experience predominantly reported positive outcomes, with 189 individuals classified as "Good". Among those with more than 10 years of experience, 50

individuals reported a "Good" outcome. Participants with 2 to 5 years of experience showed 32 "Good" responses. Overall, the data showed that a majority of participants across all experience levels reported favorable outcomes, with the highest proportion of "Good" responses observed in the 6 to 10-year experience group (Figure 5).

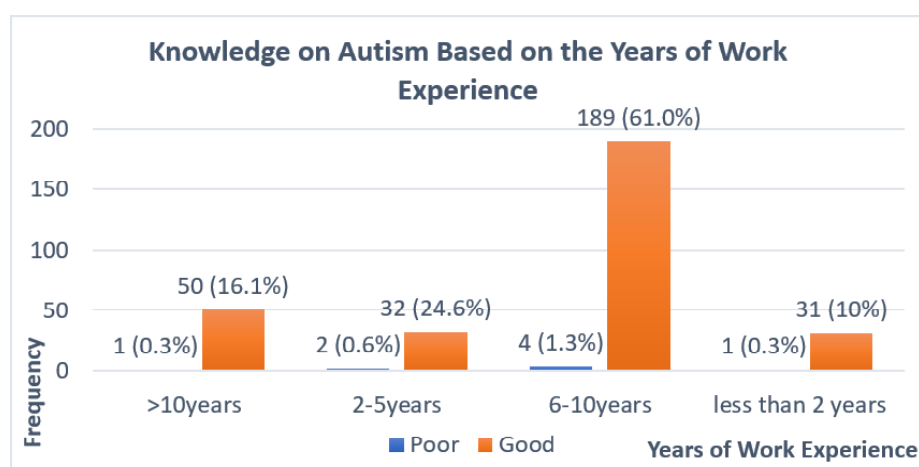


**Figure 5: Frequency Distribution of Nurses' Knowledge on Autism Spectrum Disorder in Fako Division according to Years of Work Experience Following Educational Workshop**

Also, the post-educational workshop data indicated that the majority of participants across different types of institutions reported positive outcomes; private

institutions showed a favorable response, with 131 participants reporting "Good" outcomes, followed by the government institutions (Figure 6).

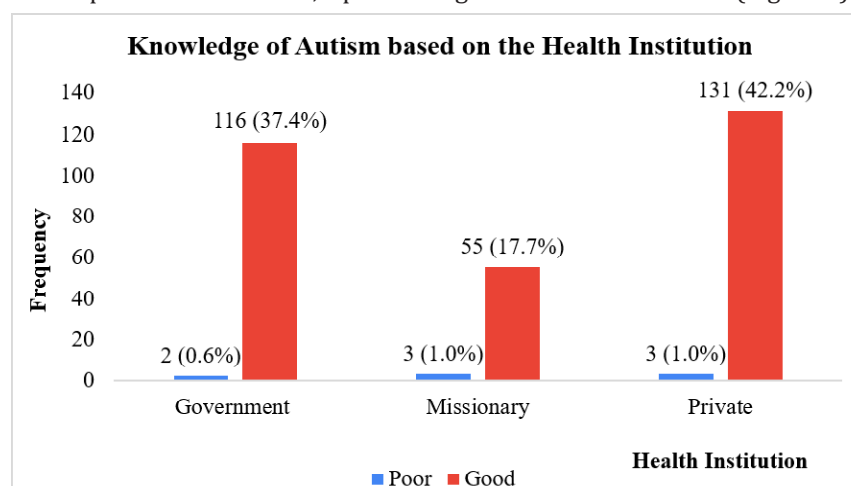


**Figure 6: Nurses' Knowledge on Autism Spectrum Disorder Across Health Institutions in Fako Division Post-Workshop**

Knowledge on autism per health district demonstrated predominantly positive outcomes following the intervention. Tiko showed entirely favorable results, with all 100 participants reporting “Good” outcomes (Figure 7).

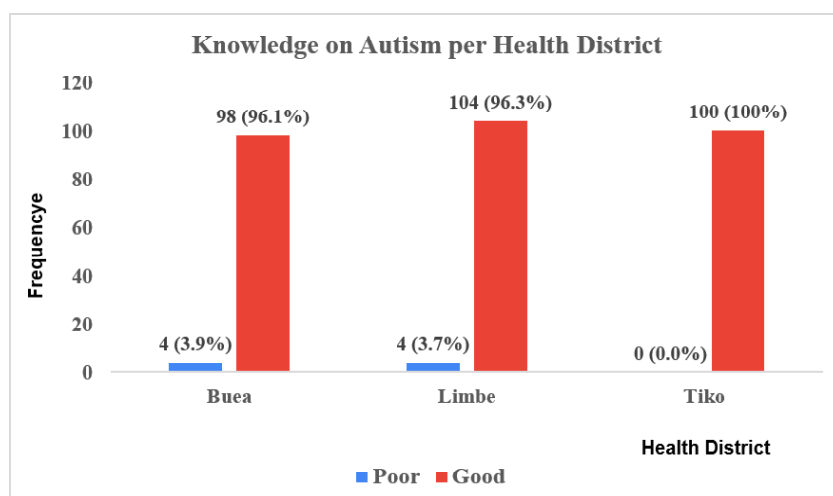


**Figure 7:** Results on Post-Educational Workshop on Nurses' Knowledge of Autism Spectrum Disorder per Health District

Following the Educational Workshop, the challenges in management of Autism Spectrum Disorder (ASD) from the perspective of nursing care showed that the most significant challenge was communication difficulties (306) 98.7%. Regarding interventions, behavior therapy emerged as the most effective approach for managing ASD symptoms, (306) 98.7%. Regarding early intervention, 98.7% (306)

of the participants affirmed that it significantly improves developmental outcomes. Sensory sensitivities are universally acknowledged, with all participants (100%) indicating that individuals with ASD may be hypersensitive or indifferent to sounds, textures, or lights, which can impact their daily functioning (Table 10).

**Table 10:** Challenges in ASD Management Among Nurses Following Educational Workshop in Fako Division

| Variable                                        | Category                                                                 | n (%)            |
|-------------------------------------------------|--------------------------------------------------------------------------|------------------|
| Challenges nurses face when managing ASD        | Communication difficulties with patients                                 | 306 (98.7)       |
|                                                 | Easily predictable behavior                                              | 4 (1.3)          |
|                                                 | <b>Total</b>                                                             | <b>310 (100)</b> |
| Signs and symptoms of ASD                       | Sudden strict discipline                                                 | 4 (1.3)          |
|                                                 | Behavior therapy                                                         | 306 (98.7)       |
|                                                 | <b>Total</b>                                                             | <b>310 (100)</b> |
| Early management of ASD                         | It has no effect                                                         | 4 (1.3)          |
|                                                 | It significantly improves developmental outcome                          | 306 (98.7)       |
|                                                 | <b>Total</b>                                                             | <b>310 (100)</b> |
| Sensory sensitivities with ASD patient          | They may be over sensitive or indifferent to sounds, textures, or lights | <b>310 (100)</b> |
| NOT a challenge nurses face a children with ASD | Difficulty in communication                                              | 35 (11.3)        |
|                                                 | Immediate symptoms relief with medication                                | 274 (88.4)       |
|                                                 | Lack of resources                                                        | 1 (0.3)          |
|                                                 | <b>Total</b>                                                             | <b>310 (100)</b> |

The highest level of education was significantly associated with responses; participants holding a Diploma or Master's Degree showed higher positive responses (98.4% and

98.8%, respectively) compared to those with a Bachelor's Degree (90.7%), with a Chi-square value of 9 ( $p = 0.011$ ), as shown in Tables 11a & b.

**Table 11:** Association Between Knowledge and the Sociodemographic Characteristics Following the Educational Workshop in Fako Division

| Variable                          | Category          | Good               | Poor            | Chi-Square | P-value |
|-----------------------------------|-------------------|--------------------|-----------------|------------|---------|
| <b>Gender</b>                     | Female            | 219 (97.30)        | 6 (2.70)        | 0.024      | 0.876   |
|                                   | Male              | 83 (97.60)         | 2 (2.40)        |            |         |
|                                   | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |
| <b>Age Group</b>                  | 20-33             | 116 (95.90)        | 5 (4.10)        | 1.923      | 0.382   |
|                                   | 34-46             | 114 (98.30)        | 2 (1.70)        |            |         |
|                                   | 47-60             | 72 (98.60)         | 1 (1.40)        |            |         |
|                                   | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |
| <b>Highest Level of Education</b> | Bachelor's Degree | 39 (90.70)         | 4 (9.30)        | 9.01       | 0.011   |
|                                   | Diploma           | 184 (98.40)        | 3 (1.60)        |            |         |
|                                   | Master's Degree   | 79 (98.80)         | 1 (1.30)        |            |         |
|                                   | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |
| <b>Marital Status</b>             | Married           | 215 (96.80)        | 7 (3.20)        | 1.02       | 0.313   |
|                                   | Single            | 87 (98.90)         | 1 (1.10)        |            |         |
|                                   | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |
|                                   |                   |                    |                 |            |         |

**Table 11b:** Association Between Knowledge and the Sociodemographic Characteristics Following the Educational Workshop in Fako Division

| Variable                              | Category          | Good               | Poor            | Chi-Square | P-value |
|---------------------------------------|-------------------|--------------------|-----------------|------------|---------|
| <b>Years of Experience as a Nurse</b> | >10 years         | 50 (98.00)         | 1 (2.00)        | 1.788      | 0.618   |
|                                       | 2-5 years         | 32 (94.10)         | 2 (5.90)        |            |         |
|                                       | 6-10 years        | 189 (97.90)        | 4 (2.10)        |            |         |
|                                       | Less than 2 years | 31 (96.90)         | 1 (3.10)        |            |         |
|                                       | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |
| <b>Health Institution</b>             | Government        | 116 (98.30)        | 2 (1.70)        | 1.98       | 0.372   |
|                                       | Missionary        | 55 (94.80)         | 3 (5.20)        |            |         |
|                                       | Private           | 131 (97.80)        | 3 (2.20)        |            |         |
|                                       | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |
| <b>Health District</b>                | Buea              | <b>98 (96.10)</b>  | <b>4 (3.90)</b> | 3.92       | 0.141   |
|                                       | Limbe             | 104 (96.30)        | 4 (3.70)        |            |         |
|                                       | Tiko              | 100 (100.00)       | 0 (0.00)        |            |         |
|                                       | <b>Total</b>      | <b>302 (97.40)</b> | <b>8 (2.60)</b> |            |         |

The association between the knowledge and the challenges in managing ASD after the Educational Workshop indicated that a vast majority of participants, 298(96.7%) believed that certain interventions are beneficial. The chi-square analysis revealed no significant association between this variable and responses ( $\chi^2 = 0.107$ ,  $p = 0.743$ ). Concerning the role of early intervention in managing ASD, an overwhelming majority (97.4%) recognized that early intervention significantly improves developmental outcomes, with only 1.3% perceiving it as having no effect; this significant difference was confirmed

by a chi-square value of 152.974 ( $p = 0$ ). When asked about sensory sensitivities, 2.6% of participants reported individuals with ASD being over-sensitive or indifferent to sounds, textures, and lights. Regarding challenges faced by nurses, difficulty in communication was identified as a significant challenge by 10% of participants, while the majority (87.1%) reported immediate symptom relief with medication as a major challenge, with a chi-square value of 12.294 ( $p = 0.002$ ). Other challenges such as lack of resources were minimally reported (0.3%) and were not statistically significant (Table 12).

**Table 12:** Association between Nurses' Knowledge and Challenges in Managing ASD Following the Educational Workshop in Fako Division

| Variable                                                 | Category                                                  | Good               | Poor               | Chi-Square | P-value |
|----------------------------------------------------------|-----------------------------------------------------------|--------------------|--------------------|------------|---------|
| <b>Management of ASD symptoms</b>                        | No                                                        | 4 (1.30)           | 0 (0.00)           | 0.107      | 0.743   |
|                                                          | Yes                                                       | 298 (96.70)        | 4 (1.30)           |            |         |
|                                                          | <b>Total</b>                                              | <b>306 (99.10)</b> | <b>4 (1.30)</b>    |            |         |
| <b>Early management of ASD</b>                           | It has no effect                                          | 4 (1.30)           | 0 (0.00)           | 152.974    | <0.001  |
|                                                          | It significantly improves developmental outcome           | 302 (97.40)        | 302 (97.40)        |            |         |
|                                                          | <b>Total</b>                                              | <b>306 (99.10)</b> | <b>302 (97.40)</b> |            |         |
| <b>Sensory sensitivities affect individuals with ASD</b> | Over sensitive or indifferent to sounds, textures, lights | 8 (2.60)           | 0 (0.00)           | N/A        | N/A     |
|                                                          | <b>Total</b>                                              | <b>8 (2.60)</b>    | <b>0 (0.00)</b>    |            |         |
| <b>NOT a challenge nurses face</b>                       | Difficulty in communication                               | 31 (10.00)         | 4 (1.30)           | 12.294     | 0.002   |
|                                                          | Immediate symptom relief with medication                  | 270 (87.10)        | 4 (1.30)           |            |         |
|                                                          | Lack of resources                                         | 1 (0.30)           | 0 (0.00)           |            |         |
|                                                          | <b>Total</b>                                              | <b>302 (97.40)</b> | <b>8 (2.60)</b>    |            |         |

The thematic analysis of post-test responses on support or resources necessary for nurses to effectively manage autism in Fako Division of Cameroon showed that 125(40.3%) of the respondents reported lack of Specialized Training and Continuous Professional Development as stated, "Regular workshops and refresher training on autism management should be mandatory". "Nurses need ongoing training on behavioral and communication techniques specific to autistic individuals". Fifty-eight (33.9%) reported lack of Multidisciplinary Support and Collaboration as stated, "There should be a team-based approach involving psychologists, occupational therapists, and speech therapists". "Referral systems and access to autism specialists are crucial. Also, Educational Materials and Communication Aids were suggested by participants, 22(7.1%) as stated; "Visual aids, sensory tools, and autism-friendly materials should be available in health centers". "Communication boards and pictorial charts help in managing non-verbal autistic patients". Family and Community Support Systems 22(7.1%) as stated, "Support for caregivers and education for families is just as important as training for nurses". "We should involve the family in every care plan"

110 (35.5%) mentioned lack of Public Awareness and Stigma as the biggest challenge in managing autism in Fako Division as stated, "Many families hide their children due to fear of stigma". "Autism is still misunderstood in our

communities; people think it is a spiritual problem". Again, 88(28.4%) participants reported limited Diagnostic and Therapeutic Services were reported as challenges in managing autistic patients as stated, "There are no centers for early diagnosis or therapy in rural areas; "Children are not diagnosed early because of lack of resources". In addition, insufficient Policy and Institutional Support were challenges in managing autistic patient as stated, "The government has not prioritized autism; we need national policies on neurodevelopmental disorders". "Hospitals need guidelines for autism management". Furthermore, Cultural Beliefs and Traditional Practices, 100(32.3%) was reported as stated, "Some parents first consult traditional healers, losing valuable time". "Cultural myths delay seeking medical help." "Some people think autism is witchcraft." "Parent hide autistic children out of shame."

## DISCUSSION

This study revealed that a majority of the nurses in Fako Division had poor knowledge on autism spectrum disorder. This could be due to the fact that current curriculum does not elaborate on autism and the lack of continuing education and professional training. This finding is consistent with the findings of Eta [10], which reported a significant portion of nurses lacked knowledge on autism due to substantial gap in the education and training of nurses on

autism. According to Eta *et al* [1] there is an urgent need to organize seminars for nurses to improve and upgrade their knowledge of autism. Many healthcare facilities do not offer autism-specific workshops or refresher courses for nurses. Even when training is available, participation may be low due to workload or work pressure and time constraint. Nurses rely on myths and misconceptions information instead of evidence-based practices in autism care [17].

In addition, the consequences of poor knowledge is poor management of autistic patients and inability to overcome challenges including delayed diagnosis and misidentification. Nurses play a crucial role in early screening [1], but poor knowledge means many autism cases go unnoticed. Autism symptoms such as lack of eye contact, social withdrawal, and repetitive behaviors may be misinterpreted as behavioral problems or intellectual disabilities. Late diagnosis limits early intervention opportunities, leading to worse long-term developmental outcomes for ASD patients [18]. Ineffective communication and patient management can be challenging as nurses struggle to engage with non-verbal ASD patients due to limited training in alternative communication methods such as Picture Exchange Communication System during structured routines. Lack of knowledge about sensory sensitivities leads to stressful clinical experiences, as hospitals are often bright, noisy, and overwhelming for ASD patients. Behavioral challenges such as meltdowns, aggression and self-stimulatory behaviors may be mismanaged due to lack of de-escalation strategies [19]. Finally, lack of knowledge about autism can lead to increased stress for nurses and families of autistic persons. Nurses feel unprepared to handle ASD-related emergencies or behavioral outbursts. Families of ASD patients often struggle to communicate with hospital staff, leading to frustration and distrust in the healthcare system. Again, poor autism knowledge reduces nurses' confidence, making them less likely to advocate for autism-friendly healthcare changes [20].

The research findings indicate significant challenges faced by nurses in Fako Division when managing autism spectrum disorder (ASD) patients. These challenges primarily stem from limited autism-specific education, communication barriers, sensory sensitivities, and inadequate institutional support. The hypothesis tested indicated that, nurses faced challenges in the management of autism in the Fako Division of Cameroon. This is in confirmatory to a study carried out by Esegbe [21]. The most critical challenge in autism management is the lack of formal autism training among nurses. Many nurses reported never receiving structured ASD education,

resulting in misconceptions about autism symptoms, causes, and management strategies.

This finding also aligns with previous studies conducted by Eta *et al* [1, 9, 10], which confirms systemic gaps in autism knowledge among healthcare providers in Cameroon especially nurses due to lack of educational seminars and workshops. Without proper training, nurses struggle to identify ASD symptoms accurately, leading to delayed diagnosis and inappropriate interventions. The absence of standardized autism care protocols in hospitals exacerbates the issue, leaving nurses dependent on personal experience rather than evidence-based practices. A significant challenge identified is communication barriers with ASD patient. Nurses' lacks communication skills communicating with autistic patient and thus communicate solely with caregivers making care not patient-centered and inadequate since patient need to express how they feel. Likewise, a study carried out by Corden [22] found that communication barrier such as difficulty interpreting emotions needs were common. This implies nurses lack autism-specific awareness and training.

Our study revealed that nurses faced difficulty in interacting with non-verbal ASD patients. This is similar to the studies by Ayakaka *et al* [23], who found that healthcare providers including nurses struggled with non-verbal communication sensory sensitivity and lacked confidence in managing autistic patient. Many nurses reported limited exposure to alternative communication techniques such as Picture Exchange Communication System (PECS), sign language, or structured visual aids. As a result, nurses often misinterpret autistic patients' behaviors, leading to frustration among caregivers and ineffective patient management. This communication gap reduces trust between nurses and ASD families, reinforcing the need for specialized autism communication training in nursing education.

Also, sensory sensitivities and environmental challenges in hospital setting was reported. This could be due to the fact that autistic patients could be hyperactive now and later less active making care difficult. It is worth noting that hospital environment often evokes extreme aversive reactions due to fluorescent lightening, loud alarms, and strong cleaning smells [24]. The results of the educational workshop demonstrated a significant improvement in nurses' knowledge of autism spectrum disorder (ASD), as evidenced by the higher post-test scores compared to pre-test assessments. This increase highlights the effectiveness of structured training interventions in enhancing nurses' competencies in autism care, including

recognizing symptoms, applying management strategies, and improving communication techniques with ASD patients [25].

Prior to the educational workshop, pre-test assessments revealed that many nurses in Fako Division had generally poor knowledge about ASD. Most participants demonstrated limited understanding of the core characteristics of autism, early signs of ASD such as social deficits, repetitive behaviors, and sensory sensitivities. Also, best practices for patient communication for example, use of visual aids, structured routines, and alternative communication techniques were not known, as well as behavioral management strategies such as de-escalation techniques, sensory-friendly hospital adjustments. The low pre-test scores confirm previous studies by Eta [1, 9, 10] indicating systemic gaps in autism-specific training among nurses. This deficiency negatively impacts early diagnosis, intervention strategies, and patient-centered care in clinical settings. The lack of formal training on ASD in nursing curricula and limited continuous professional development opportunities may have contributed to this knowledge gap. In addition, the stigma surrounding neurodevelopmental disorders in some communities may lead to underexposure and lack of clinical experience among nurses.

Following the educational intervention, there was a statistically significant improvement in nurses' knowledge levels across all assessed domains. Participants showed better understanding of autism symptoms, early identification, communication strategies, and patient-centered approaches such as behavioral intervention strategies. Participants showed better comprehension of sensory sensitivities and the importance of modifying hospital environments to accommodate ASD patients. Nurses can now appreciate the importance of family-centered care and the impact of the social environment in managing autism. This supports the hypothesis that structured, targeted educational workshops can be an effective means of improving healthcare professionals' knowledge in under-resourced settings. This finding aligns with previous research that have demonstrated the positive impact of short-term training programs on Knowledge, Attitude, and Awareness of Good Clinical Practice Among Health Care Professionals [26]. In particular, the interactive nature of the workshop, which included case scenarios, group discussions, and videos, might have enhanced learning and retention.

Despite the success of the workshop, nurses reported perceived challenges in fully implementing autism care strategies, including lack of institutional support, many

hospitals lack autism-specific policies, leaving nurses without standardized protocols for ASD care. Also, limited resources; absence of visual aids, sensory-friendly spaces, and autism screening tools continues to hinder effective patient management. In addition, the need for continuous education was perceived as a necessary resource, while knowledge levels increased, long-term knowledge retention may decline without refresher training programs. To sustain and expand the benefits of the workshop, health training institutions should integrate mandatory autism training into nursing curricula [27]. Health facilities on their part should implement hospital-wide autism care guidelines to ensure consistent clinical application and provide periodic refresher courses to reinforce autism-friendly practices. The educational workshop successfully enhanced nurses' knowledge of autism, demonstrating the critical role of structured interventions in improving ASD patient care. However, institutional barriers and resource constraints must be addressed to ensure long-term competency and effective implementation in clinical settings. Strengthening autism education programs and healthcare policies will empower nurses to provide optimal, patient-centered care for individuals with ASD.

### Implications for Practice

The observed improvement in knowledge suggests that targeted educational interventions can play a major role in bridging knowledge gaps among nurses regarding ASD. Given that nurses often serve as first points of contact in the healthcare system, equipping them with the necessary skills and knowledge is critical for early detection and appropriate referral of children with ASD. This has important implications for public health strategies in Cameroon, where access to specialized mental health services is limited. In addition, the findings support the integration of ASD-related content into pre-service and in-service nursing education. Furthermore, regular workshops, continuing education, and inclusion of ASD in national health policy training programs could help sustain and further improve the level of awareness and competence among nurses

### CONCLUSION

The findings revealed that nurses possess limited knowledge of autism, with significant gaps in symptom recognition, communication strategies, and patient management techniques. Challenges in managing ASD patients were found to stem from communication barriers, sensory sensitivities, behavioral complexities, and inadequate institutional support. Many nurses lack exposure to ASD-specific training, leading to high-stress clinical encounters and difficulty applying evidence-based

care strategies. The study confirmed that educational intervention significantly improve autism knowledge, with nurses demonstrating higher post-training competence in symptom identification, structured communication, and environmental modifications. Based on the findings of the study we propose scale up educational workshop to include other healthcare workers such as general practitioners, community health workers, and caregivers across the Fako Division and beyond. There is need for structured autism education in nursing curricula.

The creation of autism-friendly hospital policies will enhance efficient in patient-centered care. Hands-on training proved particularly effective, reinforcing the need for mandatory continuing education programs to ensure long-term knowledge retention and clinical application. To enhance nursing proficiency in autism care, healthcare institutions should integrate autism-specific training, develop standardized ASD care guidelines, and implement sensory-friendly hospital environments. Long-term strategies must focus on continuous professional development, hospital policy reforms, and multidisciplinary collaboration to ensure quality and safe patient-centered care for individuals with autism.

### Limitation of the Study

The training duration was relatively short, focusing on immediate knowledge improvement, but did not evaluate long-term retention or behavioral changes over time. Future studies should assess knowledge retention months after training to determine the sustainability of educational interventions. In addition, this research focused solely on nurses in Fako Division, extending the study to multiple divisions or regions within Cameroon and including other healthcare professionals like medical doctors, midwives, and therapists is mandatory. This could provide a broader understanding of interdisciplinary ASD knowledge gaps in the national healthcare system, which could ultimately enhance autism care.

### Acknowledgments

The authors thank the journal for its support in publishing this work.

### Conflicts of interest

The authors declare that there are no conflict of interest.

### Funding

None.

### REFERENCES

1. Eta VEA Developmental Disabilities (Autism): Comprehensive guide for nurses, midwives and special educators. 1st ed. Vol. 1. United Kingdom: Lambert Academic Publishing; 2021.
2. Autism South Africa. About us. Available from: <https://www.aut2know.co.za/>.
3. Autism CRC. About us. Available from: <https://www.autismcrc.com.au/>
4. Centers for Disease Control and Prevention. Autism and Developmental Disabilities Monitoring (ADDM) Network. Available from: <https://www.cdc.gov/ncbddd/autism/addm.html>.
5. National Autistic Society. About us. Available from: <https://www.autism.org.uk/>
6. Research, clinical, and sociological aspects of autism. *Front Psychiatry*. Available from: <https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsy.2021.481546/full>.
7. Smith A, et al. Nurses' perspectives on caring for individuals with autism spectrum disorder: A qualitative study. *J Autism Nurs*. 2016;19(4):112–125.
8. Munir KM, Musa G, Newton CR, et al. The spectrum of neurodevelopmental disorders in children in Africa: a review. *Afr Health Sci*. 2008;8(3):148–158.
9. Eta VEA. Knowledge and attitudes regarding autism among nurses in Fako division, Cameroon. *Nursing World Conference 2023*. Available from: <https://nursingworldconference.com/program/scientific-program/2023/knowledge-and-attitudes-regarding-autism-among-nurses-in-fako-division-cameroon>
10. Eta VEA, Nchinda Ngek ES, Ihenacho I. Knowledge and attitude regarding autism among nurses in Fako Division, Cameroon. *Int J Clin Epidemiol*. 2023;2(4). DOI:10.31579/2835-9232/014.
11. Koum DCK, Enyama D, Foko LPK, Noukeu D, Nguedia B, Mbono R, et al. Diagnosis and treatment challenges of autism spectrum disorder at a reference hospital in Douala, Cameroon. *BMC Pediatr*. 2023;23(1):459. DOI:10.1186/s12887-023-04242-4
12. Morris R, Greenblatt A, Saini M. Healthcare providers' experience with autism: A scoping review. *J Autism Dev Disord*. 2019;49:2374–2388. DOI:10.1007/s10803-019-03912-6.
13. Smith A, Jones B. A systematic review of healthcare professionals' knowledge, self-efficacy, and attitudes towards working with autistic people. *J Autism Dev Disord*. 2022;52(3):1234–1245.
14. Research, clinical, and sociological aspects of

- autism. *Front Psychiatry*. Available from: <https://www.frontiersin.org/journals/psychiatry/articles/10.3389/fpsyt.2021.481546/full>.
15. Smith A, Jones B, Johnson C. Nurses' perspectives on caring for individuals with autism spectrum disorder: A qualitative study. *J Autism Nurs*. 2016;19(4):112–125.
  16. Munir KM, Musa G, Newton CR, *et al*. The spectrum of neurodevelopmental disorders in children in Africa: a review. *Afr Health Sci*. 2008;8(3):148–158.
  17. Smith A, *et al*. Nurses' perspectives on caring for individuals with autism spectrum disorder: A qualitative study. *J Autism Nurs*. 2016;19(4):112–125.
  18. Smith A, Jones B. A systematic review of healthcare professionals' knowledge, self-efficacy, and attitudes towards working with autistic people. *J Autism Dev Disord*. 2022;52(3):1234–1245.
  19. Koum DCK, Enyama D, Foko LPK, Noukeu D, Nguedia B, Mbono R, *et al*. Diagnosis and treatment challenges of autism spectrum disorder at a reference hospital in Douala, Cameroon. *BMC Pediatr*. 2023;23(1):459. DOI:10.1186/s12887-023-04242-4.-11
  20. Smith A, Jones B. A systematic review of healthcare professionals' knowledge, self-efficacy, and attitudes towards working with autistic people. *J Autism Dev Disord*. 2022;52(3):1234–1245.-13
  21. Eseigbe EE, Nuhu FT, Sheikh TL, *et al*. Knowledge of childhood autism and challenges of management among medical workers in Nigeria. *Autism Res Treat*. 2015;2015:892301. doi:10.1155/2015/892301.
  22. Corden K, Brewer R, Cage E. A systematic review of healthcare professionals' knowledge, self-efficacy, and attitudes towards working with autistic people. *J Autism Dev Disord*. 2021;9:386–399. DOI:10.1007/s40489-021-00263-w.
  23. Ayakaka G. Healthcare professionals' knowledge about Autism Spectrum Disorder in children: A systematic literature review. Jönköping University; 2021.
  24. Pavlav A. Barriers to effective autism care: perspectives from healthcare providers [Internet]. 2020.
  25. Njelesani J, Couto S, Cameron D, *et al*. An international analysis of nursing education: Challenges and opportunities. *J Nurs Educ*. 2012;51(5):242–248.
  26. Doe J, Smith A, Brown K. Conceptual framework for evaluating nursing interventions in autism care. *J Autism Dev Disord*. 2023;54(3):212–225. DOI:10.1007/s10803-023-00789.
  27. NHS England. Clinical guide for front-line staff to support the management of autistic patients across specialties. London: NHS; 2023 [cited 2023 August 14]. Available from: <https://www.england.nhs.uk/long-read/clinic-guide-for-front-line-staff-to-support-the-management-of-patients-with-a-learning-disability-and-autistic-people-relevant-to-all-clinical-specialties/195/4000>

**Cite this article:** Eyen Werendeng Love line, Eta Vivian EA, Ghislain Dema, *et al*. The Effect of Educational Intervention on Nurses' Knowledge and Challenges in the Management of Autism in Health Facilities in Fako Division of Cameroon. *International Journal of Research in Medical and Clinical Science (IJRMCS)* Online ISSN:2997-6189 2026; 4(2): 95-112

**Copyright:** © 2026. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.