Perceptions toward Performance Status Scale in the Management of Head-and-Neck Cancer Patients among Health-Care Providers in Edo State, Nigeria

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Abstract

Background: The role of performance status scales (PSSs) are well documented globally in the management of cancer patients in the developed countries but not in low-income countries, mainly due to the lack of awareness. The aim of the present study is to assess the level of awareness, knowledge, and practice of PSSs among medical physicians managing head-and-neck tumors in Edo state, Nigeria. **Materials and Methods:** This descriptive cross-sectional study that recruited all physicians that manage head and neck in Edo state between April 2019 and December 2019. Data were obtained with a self-administered questionnaire, which was given to all who participants that gave written informed consent. The statistical analysis was performed using the Statistical Package for the Social Sciences version 21 (IBM, Chicago, IL, USA). **Results:** One hundred and six of the 110 randomly distributed questionnaires were retrieved, given a response rate of 96.4%. The male-to-female ratio was 2.4:1.0. The mean age was 33.3 ± 5.30 years, ranging from 25 to 46 years. Most of the respondents were within the age range of 31–40 years. Of the total 106 respondents, less than half (46.2%) had heard of PSS. More than two-thirds (73.6%) of the respondents that are aware of PSS had poor general knowledge. More than half (53.8%) of the respondents answered that they have never used PSS in the course of managing head-and-neck cancer (HNC) patients. The age, gender, years of practice, type of specialty, and location of practice were not related to the knowledge of PSS by the respondents ($P > 0.05$), but only the awareness of PSS was related to knowledge of PSS ($P = 0.02$). **Conclusion:** Most medical practitioners that manage HNC patients lack awareness and knowledge of PSSs, which reflected in poor utilization in the management of patients in routine practice.

Keywords: Head, medical practitioner, neck cancer, performance status scale, score

INTRODUCTION

Head-and-neck cancer (HNC) is any malignant neoplasm arising from the oral cavity, oropharynx, larynx, and hypopharynx.[1] The annual incidence of HNCs worldwide is >550,000 cases, with around 300,000 deaths each year.[2] Male-to-female ratio ranges from 2:1 to 4:1. About 90% of all HNCs are squamous cell carcinomas (HNSCCs). The HNSCC is the sixth-leading cancer by incidence worldwide.[3] The management of HNC is multidisciplinary, involving the Family Dental Physicians, Oral and Maxillofacial Surgeons, Plastic and Reconstructive Surgeon, Radiotherapist, Otorhinolaryngologist, and Nutritionists as well as Oncologists.[4]

Performance status (PS) is a measure of how well a person is able to carry on ordinary daily activities while living with cancer. It provides an estimate of what treatments a person may tolerate.[5] The PS is important in the overall care and management of anyone living with cancer. Understanding how well someone will do with treatment would depend on

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the type of cancer, the stage of cancer, and also on a person's general health and ability to manage their care.[6] There are several roles of performance status scale (PSS), first, to determine if someone is in reasonable health to tolerate treatments such as chemotherapy, surgery, or radiation therapy. With all cancer treatments, it is important to weigh the risks versus the benefits of treatment. For example, there may be times when chemotherapy could reduce rather than increase life expectancy. Second, to evaluate an individual's response to treatment. Thirdly, to assess the progression of cancer. Fourthly, to estimate prognosis. It also helps clinicians identify patients who may require facility and skills that are lacking so that appropriate referrals can be made to improve quality of life.[7] To meet these goals, several PSSs or measures had been reported in the literature. Some examples of PSS are the Karnofsky scale, Eastern Co-operative Oncology Group Scale (EGOGS), and Global Assessment of Functioning scale. Others are "International Physical Activity Questionnaire," Lansky scale for children, "Timed Get Up and GO" scale, "Frailly index," as well as "Short Physical Performance Battery" scale. More recently, electronic monitoring devices for PS assessment, such as smartphones and smart wristwatches have been described in the literature.[8]

Two of the more widely used scales are the Karnofsky scale and the EGOGS.[9] The latter is also called the Zubroid or World Health Organization (WHO) Scale. The PSS was described first by Karnofsky et al. in 1948.[5] It was introduced for assessing patients receiving nitrogen mustard chemotherapy for primary lung carcinoma. Each patient was given a score on a linear scale between 0 (dead) and 100 (normally active), summarizing their ability to perform daily activities, and the level of assistance they required to do so. This scoring was subsequently widely adopted in oncology practice as a numerical guide to the general health of patients. In 1960, EGOG introduced the EGOG scale published by Oken et al. in 1982 and later modified by Gordon C Zubrod, who expanded the 5-point scale to a 6-point scale with the addition of PS 5. The WHO has adopted and recommend the EGOGS due to its simplicity.[10,11]

Following our search of the literature, we found that PSS was widely used in the developed countries in the management of cancer patients,[9-12] but is underutilized by medical practitioners in developing countries like Nigeria. The aim of this study is to assess the level of awareness, knowledge, and attitude of PSS among Medical Practitioners in Edo state, Nigeria.

MATERIALS AND METHODS

The study design is a descriptive cross sectional. The participants are medical specialists who manage patients with HNCs. The specialists that were sampled are family dental physicians, otolaryngologists, and oral and maxillofacial surgeons in Edo state who consented to participate in the study. The study was carried out between April 2019 and December 2019. Anonymity and confidentiality of the respondents were assured in the design of the questionnaire.

The minimum sample size for statistically meaningful deductions was determined using the statistical formula of Fisher[13] calculating sample size: $N = Z^2P (1 − P)/d^2$. Where N is the minimum sample size for a statistically significant survey, Z is normal deviant at the portion of 95% confidence interval = 1.96, Since this is a preliminary study in Nigeria, the best guess prevalence of 50% was chosen for the estimation of sample size,[4] and d is margin of error acceptable or measure of precision = 10%. Using this formula, the minimum sample size (N) is 96. Therefore, the study of 96 respondents will give meaningful statistical deductions. However, the sample size was increased to 110 to compensate for 10% attrition. Therefore, 110 questionnaires were designed for the study.

The questionnaire was a close-ended, semi-structured, and self-administered type, and was sent physically to respondents using a well-known dental social media groups in Edo state. The questionnaire consists of 29-items divided into four groupings: (1) bio-demographic characteristics with 5-items, (2) awareness of PSS with 2 items, (3) knowledge on PSS of 18 items, and (4) attitude toward PSS of four items.

The questionnaire was developed by the researchers. The questionnaires were pretested for validity and reliability, content validation was done, and taking consensus from five experts in the fields of Family Dental Physicians, Otolaryngologist, and Oral and Maxillofacial Surgeons. The questionnaire was pretested in a pilot study on ten respondents who were not part of the study. This was done by the test-pretest method and using Cronbach's alpha coefficient to evaluate the reliability.

Demographic information inquired about the respondent's age, gender, type of specialty, years of practice, and place of practice. The awareness section inquired about respondent's awareness about PSS. Awareness of PSS was assessed to mean those who have heard of the term PSS before the commencement of the study. It also sought to answer source of awareness.

The knowledge section was narrowed to the general knowledge on PSS with the response of "yes," "no" and "don't know." The overall knowledge of PSS was assessed based on a point score system developed by the authors of this study, addressing the 18 questions on knowledge of PSS. Each response score ranges from 0 to 2 (yes = 2, no = 1, and no idea score = 0). The range knowledge of PSS score is 0–36. A score of 0–9 points with a percentage score of 0%–25% was graded as poor, score of 10–17 points with a percentage score of 26%–50% was graded as fair, score of 18–27 points with percentage score of 51%–75% was graded as good, and the score of 28–36 points with percentage score of 76%–100% was graded as excellent. The response to the question on attitude toward PSS were "strongly agree," "agree," "maybe," "disagree," and "strongly disagree." To calculate the overall attitude of the respondents, the "strongly agree" and "agreed" were combined and scored together, and the same was done for "disagree" and "strongly disagree." The most positive response to a question was scored

1, while the negative response was scored 0, and there were four questions on attitude to give an overall score 4. The overall score was converted to percentage score, which was graded as thus: 0 (<30%) as negative, 1–2 (31%–60%) as indifferent and 3–4 (>61%) as a positive attitude.

The study was analyzed using the Statistical Package for the Social Sciences version 21 (IBM Corp., Chicago, IL, USA). Simple descriptive statistics were used to define the characteristics of the study variables by counting and calculating percentages for the categorical variables. In the inferential statistic, we used Chi-square test for univariate analysis of the categorical variables. $P < 0.05$ was taken to indicate statistical significance.

Results

One hundred and six of the 110 randomly distributed questionnaires were retrieved, given a response rate of 96.4%. The Cronbach's alpha was 0.89, indicating good reliability in this study. The sociodemographic characteristics of the respondents are presented in Table 1. The male-to-female ratio was 2.4:1.0. The mean age was 33.3 ± 5.30 years, ranging from 25 to 46 years. Most of the respondents were within the age range of 31–40 years, while the least numbers were over 40 years. The majority (74.5%) of the respondents had practiced <10 years, while only 24.6% of the respondents had practiced >10 years [Table 1]. Half (50.1%) of the respondents were oral and maxillofacial surgeons while the otorhinolaryngologists comprise the least (14.1%) of the study participant. More than two-thirds (78.3%) of the respondents practiced in urban settings in this study.

Table 2 presents the awareness of the respondents about PSS. Of the total 106 respondents, less than half (46.2%) had heard of PSS. Out of this number of respondents that had heard of PSS, just only 10.2% heard about it during their undergraduate program activities, although 49.0% of the respondents claimed to have heard about in their postgraduate program. Sadly, just only 6.1% of the respondents had heard of PSS through conferences and workshops; however, social media/Internet was the second-most prevalent (16.3%) source of information claimed by the respondents [Table 2].

The knowledge on PSS by the respondents is presented in Table 3. More than two-thirds (73.6%) of the respondents had poor general knowledge as regard PSS. Specifically, only 49.1% of the respondents knew that PSS can be used to assess patients' daily physical activities. Only 21.7% knew that the Eastern Co-operative Oncology Group (ECOG) Scale is the recommended scale by WHO. More than half (80.2%) of the respondents do not know that the ECOG scale has better validity and reliability compared to the Karnofsky scale. When asked if electronic monitoring devices such as smartphones and smart wristwatches can be used to assess patient PS, only 45.5% answered correctly. More than half (52.8%) of the respondents, however, knew that it is possible to assess patients' PS in the course of history taken. Furthermore, 52.8% of the respondents answered correctly that PSS can be used to assess treatment

Table 1: Sociodemographic characteristics of the respondent (*n*=106)

Variable	Category	Frequency, *n* (%)
Age groups (years)	20-30	40 (37.7)
	31-40	50 (47.2)
	41-50	16 (15.1)
Gender	Male	75 (70.8)
	Female	31 (29.2)
Years in practice	1-5	46 (43.4)
	6-10	33 (31.1)
	11-15	20 (18.9)
	>15	7 (6.6)
Type of specialties	ENT	15 (14.1)
	OMFS	53 (50.1)
	FD	38 (35.8)
Location of practice	Rural	23 (21.7)
	Urban	83 (78.3)

ENT: Ear, nose, and throat, OMFS: Oral and maxillofacial surgery, FD: Family dentistry

Table 2: Awareness of performance status scale by the respondents (*n*=106)

Variables	Category	Frequency, *n* (%)
Have you heard of PSS before now	Yes	49 (46.2)
	No	40 (37.7)
	Don't know	17 (16.1)
If aware, source of awareness	Undergraduate program	5 (10.2)
	Postgraduate program	24 (49.0)
	Journals	7 (14.3)
	Textbooks	2 (4.1)
	Conferences/seminars/workshop	3 (6.1)
	Internets/social media	8 (16.3)

PSS: Performance status scale

outcomes in HNC patients. Unfortunately, only 18.9% knew that the Lanosky scale is used to measure PS in children. When asked if poor inter-observer variability is one of the drawbacks of most PSSs, just only 17.9% of the respondent knew the answer.

The attitude of the respondents toward PSS is presented in Table 4. It was seen that 63.2% of the respondents agreed that it is compulsory for every specialist involved in the care of HNC patient to routinely use PSS, 15.1% disagreed, and 21.7% could not form an opinion. While 43.4% of the respondents were of the opinion that the users of PSS in the management of HNC patients should undergo a training, 13.2% had a contrary opinion; however, 43.4% neither agree nor disagree. When asked the respondents if they agreed that PSS is a strong prognostic tool in the care of HNC patient, 38.7% had an affirmative opinion, 44.3% where neither "here nor there" and 27.0% were negative in their affirmation. Just only 11.3% of the respondents had an opinion that they can confidently use PSS and do not need further training; however, while 21.7% could not form an opinion, 67.5% disagreed to confidently use PSS and claimed they need further training. On

Table 3: Knowledge of performance status scale by the respondents (*n*=106)

Variable	Category	Frequency, *n* (%)
PS is used to assess patient daily physical activities	Yes	52 (49.1)
	No	12 (11.3)
	Don't know	42 (39.6)
EGOGS is the recommended scale by WHO	Yes	23 (21.7)
	No	8 (7.5)
	Don't know	75 (70.8)
EGOGS has better validity and reliability compared to Karnofsky scale	Yes	21 (19.8)
	No	6 (5.7)
	Don't know	79 (74.5)
Electronic monitoring devices such as smartphones and smart wristwatches can be used to assess patient PS	Yes	48 (45.5)
	No	5 (4.7)
	Don't know	53 (50.0)
Is it possible to assess patient PS during history taken	Yes	56 (52.8)
	No	5 (4.8)
	Don't know	45 (42.4)
PS can be used to assess treatment outcome in HNC patients	Yes	56 (52.8)
	No	4 (3.8)
	Don't know	46 (43.4)
Lanosky scale is used to measure PS in children	Yes	20 (18.9)
	No	7 (6.6)
	Don't know	79 (74.5)
International physical activity questionnaire is used to measure PS	Yes	21 (19.8)
	No	7 (6.6)
	Don't know	78 (73.6)
GAF can also be used in the assessment of PS	Yes	22 (20.8)
	No	3 (2.8)
	Don't know	81 (76.4)
Zubrod scale has a rating from 0 to 5	Yes	17 (16.0)
	No	6 (5.6)
	Don't know	83 (78.4)
The WHO scale is very easy to use	Yes	21 (20.4)
	No	5 (4.6)
	Don't know	80 (75.0)
The WHO scale is a subjective scale	Yes	22 (20.8)
	No	3 (2.8)
	Don't know	81 (76.4)
The Karnofsky scale is a linear scale	Yes	19 (17.9)
	No	3 (2.8)
	Don't know	84 (79.3)
The Karnofsky and Zubrod scales are both subjective scales	Yes	12 (11.3)
	No	4 (3.8)
	Don't know	90 (84.9)
Timed get up and go scale is an objective scale	Yes	19 (17.9)
	No	7 (6.6)
	Don't know	80 (75.5)
Short physical performance battery assesses gait speed, chair stand, and standing balance	Yes	18 (16.9)
	No	7 (6.6)
	Don't know	81 (76.5)
Frailly index has both objective and subjective components	Yes	12 (11.3)
	No	4 (3.8)
	Don't know	90 (84.9)

Contd...

Table 3: Contd...

Variable	Category	Frequency, *n* (%)
Drawbacks of most of these scales is poor inter-observer variability	Yes	19 (17.9)
	No	11 (10.4)
	Don't know	76 (71.7)
Grading of overall knowledge of PS	Poor	78 (73.6)
	Fair	13 (12.2)
	Good	9 (8.5)
	Excellent	6 (5.7)

WHO: World Health Organization, GAF: Global assessment of functioning, EGOGS: Eastern Co-operative Oncology Group Scale, HNC: Head-and-neck cancer, PS: Performance status

Table 4: Attitude toward performance status scale by the respondents (*n*=106)

Variables	Category	Frequency, *n* (%)
It is compulsory for every specialist involved in the care of HNC patient to routinely use PSS	Strongly agree	24 (22.6)
	Agree	43 (40.6)
	May be	23 (21.7)
	Disagree	6 (5.7)
	Strongly disagree	10 (9.4)
To use of PSS, we need to undergo a training	Strongly agree	20 (18.9)
	Agree	26 (24.5)
	Maybe	46 (43.4)
	Disagree	9 (8.5)
	Strongly disagree	5 (4.7)
It is a strong prognostic tool in the care of HNC patient	Strongly agree	18 (17.0)
	Agree	23 (21.7)
	Maybe	47 (44.3)
	Disagree	12 (11.3)
	Strongly disagree	6 (5.7)
I can confidently use PSS so I don't need further training	Strongly agree	4 (3.8)
	Agree	8 (7.5)
	Maybe	23 (21.7)
	Disagree	50 (47.7)
	Strongly disagree	21 (19.8)

PSS: Performance status scale, HNC: Head-and-neck cancer

the overall attitude of the respondents, though no respondents had a positive attitude toward PSS, 75.0% had an indifferent attitude while only 25.0% had a negative attitude toward PSS.

Table 5 presents the association between the knowledge of PSS and the characteristics of the respondents. The age, gender, years of practice, type of specialty, and location of practice were not related to the knowledge of PSS by the respondents (*P* > 0.05) [Table 5]. There was a significant association between awareness of PSS before this study and the knowledge of PSS among the respondents (*P* = 0.02). The attitude of respondents towards PSS was not significantly related to their knowledge on PSS (*P* > 0.05) [Table 5].

DISCUSSION

The management of HNC involves the referral of patients from the family physicians to specialists for definitive management

Table 5: Univariate analysis between knowledge of performance status scale and the characteristics of the respondents (n=106)

Variable	Category	Poor knowledge of PSS		χ²	P
		Yes, n (%)	No, n (%)		
Age (years)	20-30	31 (29.2)	11 (10.4)	0.428	0.81
	31-40	36 (34.0)	13 (12.3)		
	41-50	13 (12.3)	2 (1.8)		
Gender	Male	60 (51.8)	15 (14.2)	0.414	0.52
	Female	25 (23.6)	6 (10.4)		
Years of practice	1-5	35 (33.0)	8 (7.5)	2.399	0.49
	6-10	20 (21.7)	13 (12.3)		
	11-15	17 (16.0)	4 (3.80)		
	>15	6 (5.70)	0 (0.00)		
Type of specialty	ENT	13 (12.3)	6 (5.70)	1.768	0.41
	FD	23 (21.7)	11 (10.3)		
	OMFS	45 (42.5)	8 (7.50)		
Location of practice	Rural	15 (14.2)	4 (3.80)	0.019	0.89
	Urban	66 (62.2)	21 (19.8)		
Have you heard of PSS	Yes	26 (24.5)	19 (17.9)	8.07	0.02
	No	40 (37.7)	2 (1.90)		
	Don't know	15 (14.2)	4 (3.80)		
Source of information	Undergraduate	7 (6.60)	2 (1.89)	2.153	0.17
	Postgraduate	37 (34.9)	17 (16.0)		
	Journals	12 (11.3)	4 (3.77)		
	Textbooks	4 (3.77)	0 (0.00)		
	Conference	16 (15.1)	2 (1.89)		
	Internets	4 (3.77)	1 (0.94)		
It is compulsory for every specialist involved in the care of HNC patient to routinely use PSS	Strongly agree	17 (16.0)	7 (6.60)	8.176	0.09
	Agree	31 (29.0)	12 (11.3)		
	Maybe	21 (19.8)	2 (1.90)		
	Disagree	6 (5.70)	0 (0.00)		
	Strongly disagree	8 (7.50)	2 (1.90)		
To use of PSS, we need to undergo a training	Strongly agree	18 (17.1)	2 (1.90)	2.136	0.71
	Agree	21 (19.8)	5 (4.72)		
	Maybe	39 (36.8)	7 (6.60)		
	Disagree	7 (6.60)	2 (1.90)		
	Strongly disagree	4 (3.80)	1 (0.90)		
It is a strong prognostic tool in the care of HNC patient	Strongly agree	14 (13.2)	4 (3.77)	2.721	0.61
	Agree	17 (16.0)	6 (5.66)		
	Maybe	38 (35.8)	9 (8.94)		
	Disagree	10 (9.43)	2 (1.89)		
	Strongly disagree	6 (5.77)	0 (0.00)		
I can confidently use PSS so I don't need further training	Strongly agree	3 (2.83)	1 (0.94)	3.67	0.45
	Agree	6 (5.70)	2 (1.90)		
	Maybe	20 (18.9)	3 (2.83)		
	Disagree	36 (34.0)	14 (13.2)		
	Strongly disagree	20 (18.9)	1 (0.90)		

ENT: Ear, nose, and throat, OMFS: Oral and maxillofacial surgery, FD: Family dentistry, PSS: Performance status scales HNC: Head-and-neck cancer

after the initial assessment. Recently, the 8th ed.ition of Union for International Cancer Control tumor-node-metastasis classification of malignant tumors requested that PS and addictions towards tobacco, areca nut, and alcohol should be considered as essential prognostic factors during the staging of malignant tumors.[14]

It is a worrisome fact that nine-tent of the respondents had not heard of PSS before this study, and this could be the reason for the significant association between awareness and knowledge of PSS found in this study [Table 5]. Although no previous study for comparison, this low level of awareness is not encouraging due to the important role of PSS in the management of cancer patients. The majority of the respondents never heard of PSS during the postgraduate activities despite the rising prevalence of cancer in the Sub-Saharan Africa region.[3] The majority of the respondents only heard of PSS during postgraduate

programs; however, most of the respondents utilized internet services as a source of information. This is likely because majority of the respondents practiced in the urban setting where Internet connections are readily available. Sadly, just only 6.1% of the respondents had heard of PSS through conferences and workshops, and this is a clarion call for more emphasis on the role of PSS during conferences and workshops.

It is disheartening that more than two-thirds (73.6%) of the respondents had overall poor knowledge as regard PSS. Though no previous studies for comparison, this is a drawback in our health-care system that needs to be strengthened. Educational campaigns from undergraduate and postgraduate levels should be established to transmit accurate information and motivation toward PSS.

There was under-utilization of PSS in this study as more than half (53.8%) of the respondents have never used the PSS in the course of managing patients with HNC; reason could be not heard about as claimed by the majority of the respondent. Furthermore, most (49%) of the respondents agreed that PSS should be used routinely in the management of patients with HNC and this is an indication of their willingness to use the PSS. Another evidence of the willingness to use PSS if widely publicized is that majority (88.7%) of the respondent believed that PSS can be used in developing countries.

The lack of association between age, gender, years of practice, type of specialty, and location of practice, as well as awareness, is unsurprising because this finding indicated the generalized inadequate knowledge of PSS among those involved in the management of HNC. This is an urgent call on trainers at all levels of medical education to emphasize the roles of PSS in the care of cancer patients. Content validity and reliability are two key indicators of a qualified measuring instrument. These two measures ensure the stability and accuracy of the measurement tools.[15] In our study, content validity test results showed that the questionnaire developed by the researchers is a valid and reliable instrument. To the best of our knowledge, this is the first questionnaire validated in terms of content validity.

On the study limitation, though PSS is widely used globally, this study only focused on family dental physicians, otolaryngologists, and oral and maxillofacial surgeons for awareness, knowledge, and practice, making findings generalization with cautions. However, the high response rate can make generalizations.

CONCLUSION

In conclusion, most medical practitioners that manage HNC patients lack awareness and knowledge of PSSs, which was also reflected in their poor utilization of the instrument in the management of patients.

Conflicts of interest

There are no conflicts of interest.

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