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Physical Functionality of Cancer Patients Receiving Disease-Directed Therapy (DDT) with Palliative Care Compare with Patients on DDT Only in Kwara State, Nigeria

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Abstract

Physical activity is defined as any bodily movement caused by muscle contractions and resulting in energy expenditure. Palliative care is a special care for patients with active, progressive, advanced disease such as cancer where the prognosis is short and the focus of care is the quality of life. The study assessed the difference in the physical functionality of cancer patients receiving palliative care along with disease-directed therapy and cancer patients receiving only disease-directed therapy in Ilorin, Kwara State Nigeria. The study was a comparative cross-sectional research design conducted among 108 cancer patients at two tertiary institutions in Ilorin, Kwara State Nigeria using structured questionnaires. After ethical approval and clearance from the ethical review committee of the faculty of clinical sciences of University of Ilorin, Nigeria Patients who received palliative care alongside cancer-directed therapy were recruited from University of Ilorin Teaching Hospital and compared with cancer patients receiving only cancer-directed therapy from General Hospital Ilorin. About two-third 62.8% of the respondents taking palliative had good physical health, while over half 54.3% of the disease-directed therapy respondents had poor physical functioning. In addition, 34.1% of patients on both therapies reported no trouble in bending, kneeling and stooping, 23.7% could climb one flight of stairs with little help and 45.8% of the respondents reported no difficulty in bathing and dressing themselves. The relationship was statistically significant at $p < 0.05$. The study demonstrated that addition of palliative care services significantly improves patient outcomes in the domains of physical function. It therefore recommended that palliative care intervention should be part of care for cancer patients from onset of diagnosis as this may prevent subsequent symptoms and inappropriate treatment.

Keywords: *Physical Health, palliative care, cancer patients, Nigeria.*

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Introduction

Physical activity is defined as any bodily movement caused by muscle contractions and resulting in energy expenditure. Whereas physical fitness is defined as "the ability to carry out daily tasks with vigour and alertness, without undue fatigue and with ample energy to enjoy leisure-time pursuits and to meet unforeseen emergencies [1].

Optimal selection of a systemic treatment strategy is essential for patients with cancer in both the curative and palliative settings. For quality treatment, [2] stated that palliative care is holistic multi-professional care with skilled assessment and management of symptoms and problems-seeks to alleviate problems encountered by terminally ill patients (caners patients) and to enable them live well for as long as possible, to die with comfort and dignity, and to support the family. According to [3] palliative care is as an approach that improves the quality of life of patients and their families facing the problem associated with life threatening illnesses through the prevention and relief of suffering by means of early identification and impeccable assessment and treatment of pain and other problems, physical, psychosocial and spiritual.

The commonest terminally ill patients suffered from cancers and other chronic diseases, cancer is the second leading cause of death about 1 in 6 deaths are due to cancer globally and is responsible for an estimated 9.6 million deaths [4]. However, [5] estimated that 60% of new cases of cancer will occur in the less developed parts of the world4 and unfortunately, less than 10% of resources committed to cancer control are available to patients in these areas where the biggest increase in cancer is taking place [6]. Approximately 70% of deaths from cancer occurred in low- and middle-income countries findings reviled by [7]. The most common cancers in African region are cancers of the cervix, breast, liver and prostate as well as Kaposi's sarcoma as documented by [8]. The rise in the number of cancer cases is due to the ageing populations and increasing adoption of risk behaviour such as consumption of unhealthy diets, lack of physical exercise, harmful use of alcohol [7].

In Nigeria, some 100, 000 new cases of cancer occur every year, with high case fatality ratio [8]. However, [9] reviewed shows that approximately 20% of the population of Africa and slightly more than half the population of West Africa, Nigeria contributed 15% to the estimated 681,000 new cases of cancer that occurred in Africa. The findings are similar to the situation in the rest of the developing world, a significant proportion of the increase in incidence of cancer in Nigeria is due to increasing life expectancy, reduced risk of death from infectious diseases, increasing prevalence of smoking, physical inactivity, obesity as well as changing dietary and lifestyle patterns [10].

Unfortunately, terminally ill patients like cancer patients have numerous challenges to overcome. Fifty percent of them are not cured of their disease and over 70% go through severe suffering before eventual death [11]. Advanced stages of cancer or its treatment with radiation, surgery or chemotherapy adversely affects the quality of life (QoL)of patient most especially physical functionality as documented by [12] and most cancers patients often experience a complex web of problems, all of which interact [13]. These include profound symptoms of disease and treatments, which, unless alleviated, result in great suffering and pain which contributes to distress and diminish the quality of life (QoL) for the person with the terminal illness and his or her family [14].

Palliative care research in Africa predominantly focused on opioid availability and physical aspects of care, such as the assessment of pain and other symptoms, while neglecting holistic outcomes on functionality and vitality such as physical functionality of health-related quality of life (HRQoL). The concept of physical functionality is crucial to cancer patients and it is defined as 'an individual's cancer patients' perception of their position in life, in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns [15].

Since the commencement of palliative care services to cancer patients in Kwara State Nigeria, there are have been no empirical analysis to compare the physical functionality of the patients receiving both standard diseases-directed therapy and palliative care treatment with those that are receiving only standard disease directed therapy for specific cancer. This study assessed the difference in the physical health of cancer patients receiving palliative care along with standard disease-directed therapy and cancer patients receiving disease-directed therapy only. And specifically compared and determined therapy effect on the physical functioning performed by the patients and how the patients carried out normal daily routine activities (physical role). It also compared and examined the intensity of body pain suffered by the cancer patients and how pain interfered with normal activities in relation to type of therapy received. It determined the level of vitality (energy and tiredness) the patient suffered in relation to therapy received.

Methodology

It was a comparative cross-sectional research design conducted among cancer patients assessing health care services at the palliative care unit of University of Ilorin Teaching Hospital (UITH) palliative care alongside standard oncology care Disease Directed Therapy group) and cancer patients assessing only disease-directed therapy at Kwara State General Hospital Ilorin, Nigeria.

Interventions provided by the palliative care team at the UITH includes pain and symptom control, physiotherapy, psychotherapy, counselling, spiritual support, home care and bereavement support. Services providers by the trained palliative care team (including physiotherapist, nurses, medical doctors and social workers) are through outpatient care, co-management of in-patients, home based care following discharge for those patients within the catchment area. While the Interventions provided by physicians at the General Hospital Ilorin was majorly cancer directed, which includes chemotherapy and necessary surgery.

The eligibility criteria to be part of the study include, the patients are pathologically proven to have a form of cancer and on disease directed therapy for at least one year. The patient had physical and cognitive capability to participate in the study and on experimental group on the palliative care for at least four weeks. However, patient with any psychiatric disease or are unable to respond to the questions were excluded. After a period of six months of follow up and data collection, total of 108 patients were interviewed.

Sample Size Determination

The sample size for the study was determined for each group (those receiving palliative care along with standard disease-directed therapy and those that are on only standard care) by using the formula for calculating sample size of comparison of two proportions.

$$n = \frac{(U + V)2[P_1(100 - P_1) + P_2(100 - P_2)}{(P_1 - P_2)}$$

Where,

n = Minimum sample size when the population is more than 10,000

U = Standard Normal Deviate (SND) corresponding to the power of 80% = 1.28

V = Standard Normal Deviate (SND) corresponding to the confidence level of 95% for a two-tailed test = 1.96

P2 = Proportion of Cancer patients on usual oncology and palliative care therapy 64%[8]

P1 = Proportion of Cancer patients on standard disease-directed therapy alone 49.1%[15]

$$n = \frac{(1.28 + 1.96)^2[64(100 - 64) + 49.1(100 - 49.1)]}{(64 - 49.1)^2}$$

$$=59$$

To compensate for non-response, assuming a 10% non-response. The sample size would be calculated using the following;

$\Pi n_f = {}^{n}\!/1 - \Pi n_f$

n= calculated sample size

$n_{nf} =$ sample size per comparison group, compensated for non-response rate

$\prod n_f = {}^{n}\!/1 - \Pi n_f$

$\Pi n_f = {}^{n}\!/0.9$

$59/0.9$

$=66$

Multistage sampling technique was adopted for patients interviewed. In stage one, we obtained the list of all cancer patients, both in-patient and outpatient, receiving palliative care at the Pain and Palliative care centre, of UITH, Ilorin and list of all cancer patients, both in-patient and outpatient, receiving disease-directed therapy at Kwara State General Hospital, Ilorin from the records department. At stage two, we followed and identified the wards the patients were admitted and their clinic days.

At stage three all the patients on admission in the wards, and those that came to the clinics for routine check-ups were invited to participate in the survey. All patients were given individual treatment numbers at the clinics, ensuring that they were not included more than once in the study. Patients were recruited as they came in to the hospital. After six months of followed up 66 patients receiving both palliative care and disease-directed therapy category at the University of Ilorin Teaching Hospital and 42 patients receiving only disease-directed therapy were interviewed. Patients' pull at the General Hospital Ilorin is lower compared to that of the Teaching Hospital.

An interviewer-administered questionnaire, HRQoL was assessed using a validated SF-36 version 2 questionnaire translated into local languages (for patients not conversant with English language) and back to English language to ensure that translation is reliable. The SF-36 questionnaire is a tool to holistically assess health-related quality of life and to adopt intervening methods to improve health-related quality of life.

The collected data were coded, entered in to the systems and analysed using the statistical package SPSS version 21.0 for Microsoft Windows. Relevant descriptive statistics was computed for all items. Scoring of the SF-36 questionnaire was scaled so that a score of 1 represented the worst subjective function and a score of five represented no subjective deficit. Each domain (pain, activity, etc.,) was scored separately. Each question had 2-5 options depicted as A through E. The five positive option question were scored as follows A=5, B=4, C=3, D=2, E=1, while the negative options scored as; A=1, B=2, C=3, D=4, E=5. The four option questions were coded as A=4, B=3, C=2, D=1. The three-option questions were scored as A=3, B=2, C=1 while the two option questions were scored as A=2, B=1.

A higher score represents a 'better' level of functioning or a 'low' level of symptoms. The score served as the dependent variable in the study for the purpose of data analyses. The mean score per patient was obtained by finding the average of the 36 questions. The domain scores were added and the mean was calculated to obtain the composite score [16]. Presentation of data was in prose, frequency tables, charts and graphs. Other relevant summary statistics are also generated.

Data were statistically described regarding frequencies (number of cases) and percentage when appropriate. Comparison of numerical variables between the study groups was performed. The value of $p<0.05$ was considered statistically significant.

Ethical approval and clearance were sought and obtained from the ethical review committee of the faculty of clinical sciences of University of Ilorin, Nigeria. Oral consent was obtained from each participant before conducting the interview. Respondents were free to decline response or withdraw from the study if they so wish without any penalty. To ensure confidentiality, no names were recorded on the questionnaire. Study instruments were kept in a safe place and were only accessible to members of the research team. Ethical clearance was obtained at the points of exit from the study area.

Results

The modal age of the respondents was 49 years and the mean were 50.9 years. There were two peaks of occurrence of cancer. Thirty-two (47.2%) respondents were in the 41–50 years' age group while twenty-two (21.2%) respondents were in the 51–60 years' age group.

Forty-one respondents (50.0%) were Muslims, (44.70%) Christians and others (5.3%) were of different religious affiliation. The Yoruba ethnic group constituted the largest single ethnic group with 56 (59.6%) respondents, followed by the Hausa 14 (14.9%). Other tribes (15.0%) respondents.

Table 1: Socio-demographic Characteristics of the Respondents (N=108)

Variable	DDT Group (%)	DDT and PC (%)	Total (%)

Age (years)			
20 and below	0(0,0)	1(1.5)	1(0.9)
21-30	(7.1)	3(4.5)	6(5.6)
31-40	7(16.6)	15(22.7)	22(20.3)
41-50	25(59.5)	26(39.3)	51(47.2)
51-60	7(16.6)	16(24.2)	23(21.2)
>61	0(0)	5(7.6)	5(4.6)
Sex			
Male	15(35.7)	27(45.8)	40(42.6)
Female	27(64.3)	32(54.2)	54(57.4)
Level of Education			
None	13(33.4)	26(34.2	30.6(40.8)
Primary	10(21.4)	12(19.5)	25.9(36.9)
Secondary	14(35.3)	15(18.2)	17.6(20.4)
Tertiary	8(18.0)	22(15.7)	25.9(32.3)
Ethnicity			
Yoruba	24(68.4)	32(54.2)	56(59.6)
Hausa	2(5.7)	12(20.3)	14(14.9)
Fulani	4(11.4)	5(8.5)	9(9.6)
Others	5(14.3)	10(17.0)	15(15)
Religion			
Christianity	14(40.0)	28(47.5)	42(44.7)
Islam	21(60.0)	26(44.1)	47(50.0)
Others	0	5(8.5)	5(5.3)
Income			
<20,000	4(11.4)	10(16.9)	14(14.9)
21,000-40,000	12(34.3	14(23.7)	26(27.7)
41,000-60,000	11(31.4)	17(28.8)	28(29.8)
61,000 and above	8(22.9)	18(30.5)	26(27.7)
Occupation			
Artisan	9(25.7)	6(10.2)	15(16.0)
Farmer	3(8.6)	5(8.5)	8(8.5)
Public /Civil Servant	9(25.8)	15(25.4)	24(25.6)
Trader/Business	7(20.0)	15(25.4)	22(23.4)
Others	5(14.3)	13(26.1)	15(16.0)

Note Disease Directed Therapy (DDT); Palliative Care (PC).

As seen in Table 2 shows the spectrum of cancers the patients were being managed for, with the topmost four being breast cancer (23.4%), cervical cancer (12.8%), and prostate cancer (11.7). Others with high prevalence are gastric cancer (8.5%), hepatocellular carcinoma (8.5%), and ovarian cancer (7.4%).

Table 2: Distribution of Respondents by type of cancer and Care

Diagnosis	**DDT only (%)**	**DDT & PC (%)**	**Total (%)**
Breast cancer	9(25.7)	13(22.0)	22(23.4)
Cervical cancer	6(17.1))	6(10.2)	12(12.8)
Colorectal cancer	1(2.9)	3(5.1)	4(4.3)
Gastric cancer	3(8.6)	5(8.5)	8(8.5)
Hepatocellular carcinoma	4(11.5)	4(6.8)	8(8.5)
Kaposi sarcoma	1(2.9)	1(1.7)	2(2.1)
Kidney cancer	0(0)	4(6.8)	4(4.3)
Leukemia	2(5.7)	2(3.4)	4(4.3)
Lung cancer	2(5.7)	1(1.7)	3(3.2)
Multiple myeloma	1(2.9)	2(3.4)	3(3.2)
Ovarian cancer	2(5.7)	5(8.5)	7(7.4)
Pancreatic cancer	0(0)	1(1.7)	1(1.1)
Prostate cancer	4(11.4)	7(11.9)	11(11.7)
Scrotal cancer	0(0)	2(3.4)	2(2.1)

In Table 3 below, respondents in both groups generally had a limitation of physical functioning as 94 (24.9%) reported trouble engaging in vigorous activities, climbing several flights of stairs and walking for a mile or more. However, on the average, patients on palliative care (PC) had a higher level of physical functioning in comparison with their counterparts. 34.1% reported no trouble in bending, kneeling and stooping, 23.7%could climb one flight of stairs with little help and 45.8% of the respondents reported no difficulty in bathing and dressing themselves. The relationship was statically significant at pv 0.05.

Table 3: Respondents Relationship by level of Physical functioning (PF) and Therapy (SC only or SC and PC)

Variables	**(DDT) Only**		**(DDT) and Palliative Care**			
	Yes, Limited A lot	**A limited a little**	**Not limited at all**	**Yes, limited a lot**	**Yes, limited a little**	**Not limited at all**
Vigorous Activities	19(73.1)	7(26.9)	0(0)	41(48.2)	15(17.6)	3(3.5)
Moderate Activities	15(57.7)	10(38.5)	1(3.8)	5(5.9)	36(42.4)	18(21.2)
Lift, Carry Groceries	1(3.8)	13(50.0)	12(46.2)	3(3.5)	13(15.3)	43(40.6)
Climb Several Flights	20(76.9)	6(23.1)	0	38(64.4)	21(35.6)	0
Climb one flight of stairs	7(26.9)	16(61.5)	3(11.5)	12(20.3)	33(55.9)	14(23.7)
Bend, Kneel, Stoop	14(53.8)	12(46.2)	0	7(11.9)	23(39.0)	29(34.1)
Walk a mile	26(100)	0	0	46(78.0)	13(22.0)	0
Walk several yards	14(53.8)	12(46.2)	0	42(71.2)	17(28.8)	0

Walk one hundred yards	4(15.4)	15(57.7)	7(26.9)	12(20.3)	34(57.6)	13(22.0)
Bathe, Dress	3(11.5)	16(61.5)	7(26.9)	6(10.2)	26(44.1)	27(45.8)

In Table 4, below both groups reported problems with taking part in their normal routine activities as a result of pain, fatigue or tiredness. All of the respondents not on PC (100%) and majority of those receiving PC (98.3%) cut down the amount of time spent on work, accomplished less than they would like, was limited in their normal routine work and had difficulty working. Five (14.3%) of those on only cancer-directed therapy categorized the intensity of their body pain over the past 4 weeks as severe, about half of them (57.1%) reported moderate pain and 30.8% reported mild pain. This is as against 48 (59.3%) and 28 (27.1%) PC recipients who considered the component as very mild, and mild respectively. Three (5.1%) respondents in this group reported having no pain over the last four weeks.

Table 4: Respondents Distribution by Physical Role and Therapy Received

Variable	(DDT)Only		(DDT) and Palliative Care	
	Yes	No	Yes	No
Cut down time	35(100)	0(0)	58(98.3)	1 (1.7)
Accomplished Less	35(100)	0(0)	58(98.3)	1 (1.7)
Limited in Kind of work	35(100)	0(0)	58(98.3)	1 (1.7)
Had difficulty working	35(100)	0(0)	58(98.3)	1 (1.7)

Disease Directed Therapy (DDT) Palliative Care (PC)

As seen in table 5, only five (14.3%) of those on only cancer-directed therapy categorized the intensity of their body pain over the past 4 weeks as severe, about half of them (57.1%) reported moderate pain and 30.8% reported mild pain. This is as against 48 (59.3%) and 28 (27.1%) PC recipients who considered the component as very mild, and mild respectively. Three (5.1%) respondents in this group reported having no pain over the last four weeks.

Table 5: Respondents Relationship by Intensity of Bodily Pain and Therapy Received

Variables	DDT Only	DDT and Palliative Care
Severe	5(14.3)	0
Moderate	20(57.1)	10
Mild	8(30.8)	48(59.3)
Very Mild	2(5.7)	28(27.1)
None	0(0)	3(5.1)

Disease Directed Therapy (DDT) Palliative Care (PC)

In Table 6 categorized the extent to which pain interfered with their normal work as a little bit' over the last four weeks. Only cancer patients receiving DDT with Palliative care (2.3%) reported moderate interference with normal work. While about three-quarter (60.0%) of those on only cancer-therapy categorized the extent to which pain interfered with their normal work as moderate.

Table 6: Distribution of Respondents by Extent to which Pain interfered with normal activities

Variables	DDT only n (%)	DDT + Palliative Care n (%)
Extreme	1(2.9)	0
Quite a bit	4(11.4)	6(11.7)
Moderately	21(60.0)	14(20.3)
A little bit	8(22.9)	34(54.2)
Not at all	1(2.9)	3(8.2)

A seen in table 7 below, a significant proportion (51.4%) of respondents on standard care reported that they had energy a little bit of the time and 17.1% reported not having energy at all. More than half (54.3%) of patients on diseases directed therapy (DDT) therapy only said they were peaceful some of the time, and about a quarter (37.1%) reported being tired most of time. About two-quarter (62.7%) of the respondents receiving palliative care along with standard care (DDT)reported having energy some of the time, a small percentage (1.7%) of them said they had no energy at all. About a quarter of those in this category (39.0%) and (30.5%) claimed to be tired sometimes and all of the times respectively.

About two-third (62.8) of the respondents taking palliative had good physical health, while over half (54.3) of the standard care respondents had poor physical functioning see table 8.

Table 8: Grading of Scores of overall physical health of respondents (n=108)

Overall perception score	DDT Only care n=42)	DDT care +Palliative (n=66)	Total (%)
Poor	12(54.3)	6(10.2)	25(26.6)
Good	16(45.7)	53(62.8)	69(73.4)

As seen in table 9, about 55.3% of the respondents on only cancer therapy were assessed to have poor health, while 45.7% of them were categorized as having good health. For those receiving PC, 62.8% had good health. There is a statistically significant relationship between palliative care intervention and the physical health status of respondents. pv< 0.05 (Table 9).

Table 9: Relationship between Palliative Care Intervention and Physical Health of Respondents

Variable	Physical Health		Total N (%)	χ2	p value
	Poor n (%)	Good n (%)			

DDT only	19(55.3)	16(45.7)	35(100)	12.54	0.000*
DDT+ Palliative care	6(10.2)	53 (62.8)	59 (100)		

**statistically significant at p<0.05*

Discussion

The sociodemographic characteristics of respondents show that on the average respondents in the study were in their 4th decade of life that is, cancer occurred most frequently in the age group of 40-49 years which is the age of great social and economic responsibility, especially in developing countries. Age has been reported to be the single best predictor of the risk of developing cancer. The risk of development of cancer begins at age 40 years and then increases rapidly at age 50 years. This result is opposed by a number of studies according to [17,18] studies which reported that modal age for cancer is between 50-59 years. However, the subjects in this study fall within this range of age at risk.

Data also shows that a higher percentage of the respondents were women which agrees with the findings from Zaira study [17], that a higher percentage of women with cancer was observed, corresponding to 57.6% of the respondents. This data demonstrates a demographic behaviour presented in other study [18].

Cancer patients receiving both the palliative care and normal oncology care that participated in this study were of low educational and monthly income level. The implication is that, they are contributing factors to difficulties in maintaining a good QoL which ultimately, impacts negatively on compliance of treatment and follow up of cases [19].

Cancer patient's pain was mainly due to advanced disease condition and effects of treatments like chemotherapy, physiotherapy according to [20]. From most of the patients on only cancer-directed therapy experienced limiting pain for more than four weeks. The changes associated with the reactions imposed by the various forms of cancer treatment cause a sensation of increasing fatigue, weight loss and reduction of muscle strength which compromise their functional capacity and consequently on their quality of life. However, respondents receiving palliative care in this study had low scores of bodily pains in comparison to those on only cancer-directed therapy. This is in line with [21] reviewed which shows that patients who were on palliative care had the least expression of pain. The respondents in this study had high scores of physical functioning. This is in agreement with the findings from other study on effect of breast cancer patient's quality of life after treatment. They found that the respondents were in a better physical condition after treatment [22].

It was discovered that role functioning such as doing daily activities remain relatively unaffected with cancer patients on palliative care which is similar to finding from other study [23]. The role functioning score appeared low compared to other scores in the physical health functionality domain. This could be in part to the late presentation of disease which makes daily activities virtually impossible. It could also be as a result of adaptation to palliative care late in the course of the disease. Though, the role functioning scores were lower than average, the scores for those on palliative care was a bit higher than those on only disease directed therapy.

The increase in physical functioning to climb one flight of stairs with little help and no trouble in bending, kneeling and stooping with significant no difficulty in bathing and dressing themselves are all due to tactical and aggressive physiotherapy component of the palliative care which was not observed with the patients on cancers specific therapy only. The relationship was statically significant at pv 0.05 which corroborated other studies [24,25].

The major finding of this study was that cancer survivors with higher levels of physical function are less likely to die prematurely, relative to cancer survivors with lower levels of physical function. This may be due to palliative care on lifestyle behaviour modification such as physical activity, weight loss, and eating a healthful diet may preserve or improve the physiologic systems necessary to sustain physical function as reported by [24]. Participation in physical activity preserves fast walk speed in this study may translate to improvements in patient reported and clinical outcomes. It is also corroborated with findings from other studies [2,25,26,27] with palliative such as physical activity, weight loss and eating a healthful diet are efficacious to improve physical function among older breast, prostate, and colon cancer survivors [2,26].

The study concludes that cancer patients on both diseases directed therapy and palliative care had better physical function outcome when compare with those on disease directed therapy only. We therefore recommend that cancer patients' care and treatment should be multi-disciplinary with inclusion of palliative care most especially physical therapy to enhance vitality and functionality, thereby improving the quality of life of the cancer patients.

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