



**Manchester  
Metropolitan  
University**

---

Fatoye, F ORCID logoORCID: <https://orcid.org/0000-0002-3502-3953>,  
Mbada, C ORCID logoORCID: <https://orcid.org/0000-0003-3666-7432>,  
Oluwatobi, S, Odole, A, Oyewole, O, Ogundele, A and Ibiyemi, O (2020)  
Pattern and determinants of willingness-to-pay for physiotherapy services.  
European Journal of Physiotherapy, 22 (4). pp. 221-227. ISSN 2167-9177

---

**Downloaded from:** <https://e-space.mmu.ac.uk/630023/>

**Version:** Accepted Version

**Publisher:** Taylor & Francis





**DOI:** <https://doi.org/10.1080/21679169.2019.1591502>

**Usage rights:** Creative Commons: Attribution-Noncommercial 4.0

Please cite the published version

<https://e-space.mmu.ac.uk>

# Pattern and determinants of willingness-to-pay for physiotherapy services

Francis Fatoye<sup>a</sup>, Chidozie Mbada<sup>b</sup> , Salami Oluwatobi<sup>b</sup>, Adesola Odole<sup>c</sup> , Olufemi Oyewole<sup>d</sup> ,  
Abiola Ogundele<sup>b</sup> and Olusola Ibiyemi<sup>e</sup> 

<sup>a</sup>Department of Health Professions, Manchester Metropolitan University, Manchester, United Kingdom; <sup>b</sup>Department of Medical Rehabilitation, Obafemi Awolowo University, Ile-Ife, Nigeria; <sup>c</sup>Department of Physiotherapy, University of Ibadan, Ibadan, Nigeria;

<sup>d</sup>Department of Physiotherapy, Olabisi Onabanjo University Teaching Hospital, Sagamu, Nigeria; <sup>e</sup>Department of Periodontology and Community Dentistry, University of Ibadan & University College Hospital, Ibadan, Nigeria

## ABSTRACT

**Purpose:** To evaluate willingness-to-pay for physiotherapy services and explore its determinants.

**Methods:** Willingness-to-pay, health-related quality of life and physiotherapy satisfaction were assessed in 100 physiotherapy out-patients with willingness-to-pay, Short Form-12 and physiotherapy satisfaction questionnaires, respectively. Data were analysed with Chi-square and logistic regression.

**Results:** A 45% 'no-willingness-to-pay' rate was found in this study. Pattern of willingness-to-pay for different physiotherapy modalities and techniques were varied. Socio-economic status, treatment duration, amount willing to pay for treatment and physiotherapy satisfaction were significant determinants of willingness-to-pay. With one week increase in treatment duration, the participants were 8.4% less likely willing to pay for physiotherapy. Those who were satisfied with physiotherapy treatment were 21times more likely willing to pay compared with those who were not satisfied. Those in middle and high socio-economic status were more likely willing to pay for physiotherapy compared with low socio-economic status. With an increment in amount willing-to-pay more than median fee [₦1500 (\$4.2)]; the participants were more likely willing to pay for physiotherapy.

**Conclusions:** About 50% rate of no-willingness to pay for physiotherapy services was observed among Nigerian patients. Socio-economic status, treatment duration, amount willing-to-pay for treatment and physiotherapy satisfaction were predictors of willingness-to-pay for physiotherapy services.

## Introduction

Willingness-to-pay is a construct that describes the maximum amount an individual is willing to sacrifice to procure a good or avoid something undesirable [1] and is used to measure benefits in public decision-making. The use of willingness-to-pay methods in healthcare as means to facilitate cost-benefit analysis, as a method of measuring benefits from healthcare providers and as a measure of health state preferences has been advocated [2–4]. However, Cookson [5] submits that advocacy for the use of willingness-to-pay in health care stems from the bias that health economics lags behind other areas of economics that have embraced willingness-to-pay methods.

Consequently, there is a proliferation of willingness-to-pay methods in cost-benefit analysis in health care including; willingness-to-pay for health insurance [6,7], complementary health [8], overweight and obesity prevention programme [9], nursing consultation [10] and mental health [11] among others. Thus, it is becoming increasingly popular in health economics to use willingness-to-pay approach to elicit the value people place on health and health care activities [12]. An advantage of the willingness-to-pay technique is that it measures the strength of consumer demand

in monetary units, which can then be compared to costs [13]. Willingness-to-pay studies help to identify the true demand for healthcare programmes by actively involving the patients in deciding if they want and can afford the treatment, and also if it satisfies their perceptions towards meeting their needs.

In Nigeria, physiotherapy services are available mostly in urban cities with little or none availability in the rural communities [14]. As universal healthcare coverage are very low in Nigeria with less than 40% of Nigerians willing to subscribe to community based health insurance [15]. Many Nigerians pay out-of-pocket for their healthcare and this may affect patients' adherence to physiotherapy treatments. Information about willingness-to-pay for physiotherapy services in Nigeria may help to facilitate efficient resource allocation and provision of physiotherapy services in rural communities to improve health outcomes of individuals.

There is emerging interest in understanding the correlates of willingness-to-pay in different health conditions. As such, wide range of variables such as chronic health conditions [16], high pain intensity [17], and socio-economic status and gender [18] have been implicated as significant correlates of willingness-to-pay in the field of medicine [19,20],

dentistry [21] and community based health insurance [22]. In Nigeria, studies have reported willingness-to-pay for community healthcare insurance [15,23], the treatment of tuberculosis [12] and antiretroviral drugs [24]. Similar studies on willingness-to-pay for the treatment of tuberculosis and antiretroviral drugs in Nigeria revealed that 80.0% of the respondents were willing to pay for tuberculosis treatment services [12] while only a third of clients receiving treatment for human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) are willing to pay for their antiretroviral drugs and that of a family member or spouse [24]. Whereas less than 40% of Nigerians were willing to pay for community-based health insurance with proportion of people willing to pay lower in rural communities [15]. Elsewhere, studies on willingness-to-pay for physical activity on prescription and reduction of overweight/obesity have indicated that willingness-to-pay was highest for immediate health improvement of physical activity on prescription [25]. About 50% of parents of children with overweight/obesity were willing to pay to reduce overweight/obesity of their children by half [9]. However, there is an apparent dearth of studies on willingness-to-pay in physiotherapy. Understanding willingness-to-pay for physiotherapy is important as it will aid health financing and facilitate access to physiotherapy services. This study examined willingness-to-pay for physiotherapy services and explored the determinants of willingness-to-pay in terms of socio-demographic factors, satisfaction with treatment and general health status.

## Methods

One hundred consecutive patients with neurological and musculoskeletal conditions receiving outpatient physiotherapy in three purposively selected tertiary health institutions in South-West, Nigeria participated in this cross-sectional study. Participants were individuals receiving physiotherapy for no less than three months, who had paid for therapy at least once and had no mental or cognitive impairment. A willingness-to-pay questionnaire and Short Form-12 were used to examine willingness-to-pay and health-related quality of life respectively. A proforma was used to obtain socio-demographic information of age, marital status, sex, religion, education, ethnicity, income and socioeconomic status.

### *Willingness-to-pay questionnaire*

A five-section willingness-to-pay questionnaire developed from a tool used in a willingness-to-pay study in Dentistry [18] was used in this study. The questionnaire sought information on demographics, physiotherapy experience, type of physiotherapy treatment received, least and maximum amount of money that could be paid for treatment, monetised health benefit, and what patient would have preferred to pay for instead of the treatment. In order to elicit amount the individuals would be willing to pay for physiotherapy services, participants were asked how much you would be willing to pay for the following treatments (thermotherapy, manual therapy, gym exercise and fitness

training, Cryotherapy/cold therapy and electrical stimulation). The options were between ₦ 500.00 and ₦ 5000.00 (\$1.40 and \$13.97) [at rate of ₦358/dollar during 2017]. A follow-up question was asked if participants could pay less than ₦ 500.00 (\$1.40) or more than ₦ 5000.00 (\$13.97). 'If the amount people were willing to pay was lesser than ₦ 500 (\$1.40) or more than ₦ 5000 (\$13.97) please state the amount of money or the maximum extra amount of money that you would be willing to pay and also state the intervention you are referring to?'

In order to determine the participants who were not willing to pay, a question was asked 'If you are not willing to pay any amount, what is the reason for this'. The psychometric properties of the instrument were shown to be excellent with intra-class correlation coefficient of 0.837 and Cronbach's alpha of 0.911. Using the tool, willingness-to-pay was assessed for current therapy being received by the patients.

### *General health status short form-12 questionnaire*

The Short Form-12 survey contains categorical questions (e.g. yes/no) that assessed limitations in role functioning as a result of physical and emotional health. The survey also contained Likert response formats including those that are on a three-point scale (limited a lot, limited a little, or not limited at all) that assessed limitations in physical activity and physical role functioning. In addition a five-point scale (not at all, a little bit, moderately, quite a bit, and extremely) that assesses pain, and a five-point scale that assesses overall health (excellent, very good, good, fair, and poor) are included. The Short Form-12 also contains a six-point scale (all of the time, most of the time, a good bit of the time, some of the time, a little of the time, and none of the time) that assesses mental health, vitality, and social functioning. It was interview or self-administered. Its validity and reliability have been reported to be good in assessing health-related quality of life in various disease conditions and population [26–29].

Ethical approval for the study was obtained from the Research and Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife. Administrative approvals were also obtained from respective Heads of Department of the selected facilities where the study was conducted. Each respondent gave their informed consent to participate in the study.

### *Data analysis*

Descriptive statistics (mean, standard deviation, frequency and percentages) were used to summarise the data. Chi-Square was used to examine the association between willingness-to-pay and socio-demographic factors, health-related quality of life and patient satisfaction with physiotherapy. Logistic regression was used to examine the determinants of willingness-to-pay. Alpha level was set at  $p < .05$ . Statistical analysis was carried out using IBM SPSS Statistics, version 22 (SPSS Inc., Chicago, IL).

## Results

Table 1 shows the socio-demographic characteristics of the respondents. Fifty percent of the respondents were males, in 51–60 years age category (28.0%) and in low socio-economic status (48.0%). Most of the respondents had neurological conditions (69%). Treatment duration of respondents with neurological versus musculoskeletal condition was  $19.2 \pm 13.9$  vs.  $16.3 \pm 12.1$  weeks ( $p = .288$ ).

Frequency distribution of patient's preferences and physiotherapy is presented in Figure 1. Most of the respondents would prefer to pay for infra-red therapy than load a mobile phone recharge card or voucher (88.9%). About 31.9% would prefer to pay higher insurance premiums for generous coverage of physiotherapy services. However, 11.1% of the respondents would prefer to pay for a hair restyle than for a massage.

A total of 45% 'no willingness-to-pay' was found in this study. Pattern and associations of willingness-to-pay for thermotherapy, manual therapy, exercise, cryotherapy and electrical muscle stimulation modalities is presented in Table 2. A total of 66.7% of the respondents were not willing to pay for thermotherapy modalities while 23.8% were willing to pay part. Those who were willing to pay part for thermotherapy modalities paid  $\$2.65 \pm 0.29$  while those who willing to pay full paid  $\$7.33 \pm 4.47$ . There was no significant association between willingness-to-pay for thermotherapy modalities

and religion ( $\chi^2 = 5.833$ ;  $p = .054$ ). While 29.7% were willing to pay part, 62.2% of the respondents were not willing to pay for manual therapy modalities. Those who were willing to pay part for manual therapy modalities paid  $\$3.75 \pm 1.89$  while those who willing to pay full paid  $\$9.31 \pm 3.82$ . There was no significant association between willingness-to-pay for manual therapy and any of the variables ( $p = .247-.665$ ). While 38.6% were willing to pay part, 49.3% of the respondents were not willing to pay for exercise. Those who were willing to pay part for exercise paid  $\$3.09 \pm 1.15$  while those who willing to pay full paid  $\$6.21 \pm 2.33$ . There was a significant association between willingness-to-pay for exercise and socio-economic status ( $\chi^2 = 10.534$ ;  $p = .032$ ). Similarly, there was a significant association between willingness-to-pay for exercise and age ( $\chi^2 = 16.532$ ;  $p = .035$ ). While 41.2% were willing to pay part, 58.8% of the respondents were not willing to pay for cryotherapy. Those who were willing to pay part for cryotherapy paid  $\$8.38 \pm 7.90$ . There was a significant association between willingness-to-pay for cryotherapy and marital status ( $\chi^2 = 5.234$ ;  $p = .023$ ). There was also a significant association between willingness-to-pay for cryotherapy and socio-economic status ( $\chi^2 = 8.376$ ;  $p = .015$ ). The percentage of people not willing to pay and willing to pay less for electrical muscle stimulation were the same (41.3%). Those who were willing to pay part for electrical muscle stimulation paid  $\$2.10$  while those willing to pay full paid  $\$13.97$ . There was no significant association between willingness-to-pay for electrical muscle stimulation and any of the variables ( $p = .111-.888$ ).

Association of willingness-to-pay with health-related quality of life and satisfaction with physiotherapy is presented in Table 3. Almost all the respondents (93.2%) who had fair satisfaction were not willing to pay for thermotherapy modalities while 93.3% of the respondents who also had fair satisfaction were willing to pay part for exercise modalities. There was no significant association between willingness-to-pay and satisfaction with physiotherapy level ( $p = .082-.774$ ). About half (42.1%) of the respondents who had below average health status were not willing to pay for electrical muscle stimulation modalities while 21.4% of the respondents who had above average health status were willing to pay less for exercise modalities. There was no significant association between willingness-to-pay and physical health status ( $p = .278-.483$ ). Less than half (33.3%) of the respondents who had below average health status were willing to pay full for manual therapy modalities while 57.1% of the respondents with above average health status were willing to pay part for cryotherapy modalities. In addition, there was no significant association between willingness-to-pay and mental health status ( $p = .104-.860$ ).

Using sociodemographic parameters, type of place where treatment was received, treatment duration, level of satisfaction, amount willing to paid for treatment and physical and mental status as variables in the logistic regression (backward stepwise conditional); only socioeconomic status, treatment duration, amount willing to paid for treatment and level of satisfaction were significant predictors of willingness-to-pay (Table 4). With one week increase in treatment

**Table 1.** Socio-demographic characteristics of the respondents.

Variable	Frequency	Percentage
Age (years)		
<30	17	17.0
31–40	17	17.0
41–50	16	16.0
51–60	28	28.0
>60	22	22.0
Gender		
Male	51	51.0
Female	49	49.0
Marital Status		
Single	14	14.0
Married	85	85.0
Separated	1	1.0
Religion		
Islam	15	15.0
Christianity	85	85.0
Education		
Primary	6	6.0
Secondary	43	43.0
Tertiary	47	47.0
Others	4	4.0
Ethnicity		
Yoruba	82	82.0
Igbo	14	14.0
Hausa	1	1.0
Others	3	3.0
Income (₦)		
<7,500	5	5.0
7,500–15,000	8	8.0
15,000–50,000	35	35.0
50,000–100,000	36	36.0
100,000–200,000	5	5.0
>200,000	5	5.0
Socio-economic Status		
Low	48	48.0
Middle	41	41.0
High	5	5.0

₦: Naira (₦358 is equivalent to \$1 during 2017).

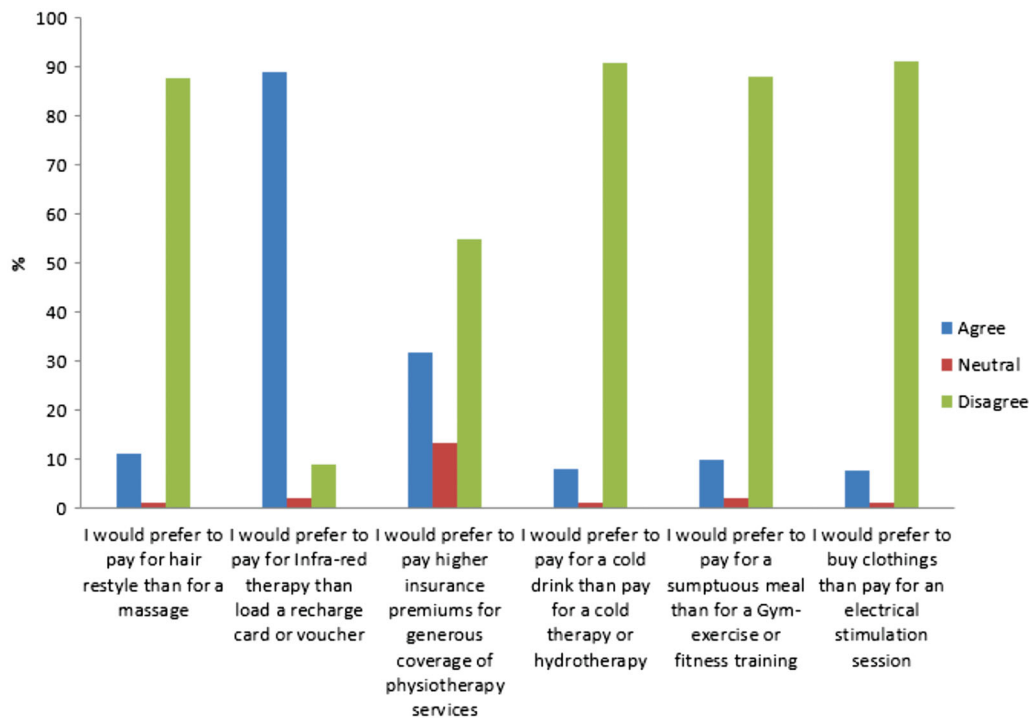


Figure 1. Distribution of patient's preferences and physiotherapy.

Table 2. Pattern and determinants of WTP for thermotherapy, manual therapy, exercise, cryotherapy and EMS modalities.

Variables	Thermotherapy		Manual therapy		Exercise		Cryotherapy		EMS	
	$\chi^2$	<i>p</i> -value	$\chi^2$	<i>p</i> -value	$\chi^2$	<i>p</i> -value	$\chi^2$	<i>p</i> -value	$\chi^2$	<i>p</i> -value
Age group (Years)	7.273	.507	10.259	.247	16.532	.035*	13.026	.111	13.026	.111
Gender	1.451	.484	1.075	.584	3.962	.138	3.962	.148	3.815	.148
Marital Status	1.298	.862	3.377	.497	2.761	.599	5.204	.023*	3.354	.500
Religion	5.833	.054	1.052	.591	2.924	.232	1.518	.218	2.381	.304
Ethnicity	0.726	.695	4.088	.665	4.429	.619	1.587	.208	2.905	.574
SES	7.925	.094	4.917	.296	10.534	.032*	8.376	.015*	1.141	.888

SES: Socioeconomic status; WTP: willing to pay; EMS: electrical stimulation; \*indicates significance.

Table 3. Association of WTP with Health-related quality of life and satisfaction with physiotherapy level.

Willingness to pay	Health-related quality of life					
	Satisfaction with physiotherapy level		Physical health		Mental health	
	$\chi^2$	<i>p</i> -value	$\chi^2$	<i>p</i> -value	$\chi^2$	<i>p</i> -value
Thermotherapy	1.806	.405	3.537	.472	1.307	.860
Manual therapy	1.642	.440	4.921	.296	5.177	.270
Exercise	0.512	.774	3.467	.483	5.335	.255
Cryotherapy			1.665	.435	4.523	.104
Electrical Stimulation	4.964	.082	5.094	.278	4.071	.397

WTP: Willingness to Pay.

duration, the willingness-to-pay for physiotherapy of the participants was 8.4% less likely (OR = 0.916, CI = 0.853–0.985,  $p = .017$ ). Those who reportedly were satisfied with physiotherapy intervention were 21 times (OR = 20.83, CI = 1.395–311.05,  $p = .028$ ) more likely to have willingness-to-pay compared with those who were not satisfied. Those in middle and high socioeconomic strata were 20 (OR = 20.18, CI = 3.02–134.74,  $p = .002$ ) and 37 (OR = 36.88, CI = 2.40–565.86,  $p = .01$ ) times more likely to have willingness-to-pay for physiotherapy compared with low socioeconomic stratum. With an increment in amount willing to pay

more than median income (₦1500 i.e. approximately \$4.2), the participants were 1.001 likely to willing to pay for physiotherapy (OR = 1.001, CI = 1.000–1.002,  $p = .003$ ).

## Discussion

This study investigated pattern and determinant of willingness-to-pay for physiotherapy services among patients attending selected outpatient physiotherapy clinics in South-West, Nigeria. The pattern of willingness-to-pay for different

**Table 4.** Logistic regression of determinant factors of WTP for physiotherapy.

	B	SE	OR	95% CI of OR	p value
Constant	-4.935	1.492	0.007		.001
Religion					
Christianity (ref)					
Islam	-2.042	1.120	0.130	0.014–1.165	.068
Socioeconomic status (SES)					
Low SES (ref)					
Middle SES	3.005	0.969	20.180	3.022–134.739	.002
High SES	3.608	1.393	36.884	2.404–565.860	.010
Treatment duration	-0.087	0.037	0.916	0.853–0.985	.017
Satisfaction with Physiotherapy					
Not satisfied (ref)					
Satisfied	3.036	1.379	20.830	1.395–311.050	.028
Amount willing to pay	0.001	0.000	1.001	1.000–1.002	.003

B: beta; SE: standard error; OR: odd ratio; CI: confidence interval

physiotherapy modalities and techniques were varied. Respondents who were 'willing to pay part' were mostly those receiving treatments with electrical stimulation modalities, those in the 51–60 years age group, as well as those of middle socio-economic class. Higher percentages of no willingness-to-pay were found among females, patients in age group 41–50 years, and those with low socio-economic status. Socio-economic status, treatment duration, amount willing to pay for treatment and satisfaction with physiotherapy were significant determinants of willingness-to-pay.

Our results indicated that respondents in the younger age categories and those in low socio-economic status were not willing to pay for exercise therapy. Patients in middle-age and older adult categories seem to require external assistance and motivation to carry out exercises [30]. Hence, may be willing to pay for exercise in a bid to secure its health benefits [25]. On the other hand, younger adults who in the pre-morbid state are involved in exercise therapy and other physical activities may consider prescribed exercises as similar to their routines and may trivialise paying for it. Contrary to the foregoing, Nielsena et al. [31] reported that people above the age of 50 appeared more reluctant to pay for an intervention against a future potential health threat and benefit. However, the present study looks at willingness-to-pay for current therapy and not future or previous therapies.

The association between socio-economic status and willingness-to-pay has been established in some studies [32,33]. It is believed that those in the low socio-economic status often are not willing to pay for health care services and other health packages [34,35]. Our results of regression are in agreement with these findings, as those in the low socio-economic status were less likely to pay for physiotherapy services compared with those in the middle or higher socio-economic status. However, there is an apparent dearth of physiotherapy related studies to the findings of this study. This made comparisons and extrapolation from published studies difficult. Nonetheless, these are in agreement with a study that reported a strong and statistically significant association between income and willingness-to-pay for urgent dental care [18]. Influence of other socio-demographics on willingness-to-pay varied for different physiotherapy modalities. Literature have stressed that socio-demographic factors (such as marital status, religion)

are important determinants of willingness-to-pay for health care services [34–36]. However, pattern of socio-demographic influence on willingness-to-pay are inconclusive in literature. Nielsena et al [31] asserted that gender, education, place of residence and age all influenced the extent to which individuals were willing to allocate present resources to alleviate a future problem.

All the respondents in the present study have had previous experience of physiotherapy. The patients that participated in this study included those with various forms of diagnosis. However, they were grouped under common themes as having either musculoskeletal or neurological conditions. Although, most of the patients in this study had neurological conditions, our results does not suggest types of health condition influenced willingness-to-pay for physiotherapy services but the level of chronicity of the conditions (musculoskeletal = 16 weeks; neurological = 19 weeks) influenced their willingness-to-pay. This was affirmed by the results of the regression analysis in the present study. With an increase in one week duration, participants were 8.4% less likely to pay for physiotherapy services. It is expected that patients with an acute musculoskeletal or neurological conditions will be more willing to pay in order to find future health benefits [37]. However, chronicity of illnesses leads to increase sensitivity to budget restraints. As a result, patients may not be willing to pay [37].

Comparing the pattern of willingness-to-pay based on treatment or modality type, highest rates for no willingness-to-pay was observed among patients receiving thermotherapy. Some studies have reported the attitude of patients receiving thermotherapy. Some consider thermotherapy as palliative or adjunctive to main treatment [38,39]. At the same time, some physical therapists demonstrate negative attitude that may hamper effective use and prescription of thermotherapy, based on certain reports from systematic reviews and meta-analyses [39,40]. Therefore, willingness-to-pay for thermotherapy may be influenced by the above-mentioned. On the other hand, there was higher rate of willingness-to-pay for electrical stimulation modalities. Patients' perception towards electrical stimulation is varied. Some studies have reported favourable patients' perceived effectiveness for electrical stimulation modalities [41–43]. Apart from reported therapeutic effectiveness of active electrical stimulation in different disease conditions [44,45], in the context of this study, there seems to be relatively high importance attached to receiving electrical stimulation, especially among patients with neurological conditions. Despite the above observations, the participants in this study demonstrated good preferences for physiotherapy modalities compared with alternative such as purchase of cold drink and mobile phone recharge card. Few studies have reported comparative analysis of preferences involving treatment being received and other alternatives of importance. A study by Steidtmann et al. [46] reported that majority of patients had preferences for treatment(s) being received which may be influenced by belief or duration of treatment.

It is likely that quality of interaction with physiotherapy staff, how well they felt they were listened to by

physiotherapy staff and the extent of actual and perceived improvement might be responsible for their satisfaction at first appointment, personal aspects of care, continuity of care, last visit, and overall care [47]. This might be responsible for their willingness-to-pay for physiotherapy services as our results indicated that those that reported satisfaction with physiotherapy services were more likely to pay for physiotherapy compared with those who are not. Again, these may suggest that satisfaction with physiotherapy is a more influencing factor than other factors listed above. This finding is in conformity with general economic principle of demand for a commodity, where utility/satisfaction is one of the major reasons why people demand/pay for any commodity [48]. Their satisfaction with physiotherapy services may also be influenced by the positive religious belief held by the participants. Religion has been shown to positively influence satisfaction with therapies. For example, Druss et al. [49] reported that religion is significantly related to patients' satisfaction and how they rate their health care experiences. However, satisfaction with payment arrangement/fee schedule has the least positive rating.

Regardless of the fact that health-related quality of life instruments have provided important insights into the lives of patients with moderate to severe chronic ill-health and have been essential in indicating that some treatments improve the lives of patients with chronic ill-health undergoing rehabilitation [50]. The physical or mental health status does not influence willingness-to-pay in this study. However, Useh and Boilane [51] implied that physiotherapy does impact self-care of patients and therefore can be used to improve the general health status or health-related quality of life of patients. Abel et al. [52] reported that functional limitation, which is proportionate to health state, has been associated with decreased general health status and that physical activity improves physical health by decreasing pain, and improves function and delays disease progression and its subsequent disability which is parallel to a good health state.

This study may have some policy implications. With about 55% willingness-to-pay for physiotherapy services reported, the burden of financing physiotherapy services by the government in rural communities may be reduced as more than half were willing to pay. This may suggest that if physiotherapy services are made available, quite a number of Nigerians will be able to access it and pay. This should encourage policy makers to facilitate supply of physiotherapy services in Nigerian rural communities and improve health outcomes of individuals.

The results of the present study should be interpreted with caution, as participants were limited to out-patients and thus, cannot be generalised to in-patients receiving physiotherapy treatment. As in all cross sectional studies, causal effect relationship cannot be adduced.

## Conclusion

Willingness-to-pay (including willingness-to-pay less) rate of 55% was found among Nigerian patients receiving physiotherapy services. The least and highest willingness-to-pay

rate was observed for thermotherapy and electrical stimulation, respectively. No willingness-to-pay was mostly determined by low socio-economic status, less satisfaction with physiotherapy, longer duration of ailment, and the amount willing to pay for treatment. The patients demonstrated better preferences for physiotherapy services compared with other non-treatment equivalents. It is recommended that willingness-to-pay be used as metric for the impact of physiotherapy, as well as, a basis for formulation of policy towards providing appropriate physiotherapy services for patients in order to improve their health outcomes.

## Disclosure statement

No potential conflict of interest was reported by the authors.

## ORCID

Chidozie Mbada  <http://orcid.org/0000-0003-3666-7432>  
 Adesola Odole  <http://orcid.org/0000-0003-1517-9499>  
 Olufemi Oyewole  <http://orcid.org/0000-0003-2432-247X>  
 Olusola Ibiyemi  <http://orcid.org/0000-0002-6603-4436>

## References

- [1] Horowitz JK, McConnell K. Willingness to accept, willingness to pay and the income effect. *J Econ Behav Organ.* 2003;51: 537–545.
- [2] Hanley N, Ryan M, Wright R. Estimating the monetary value of health care: lessons from environmental economics. *Health Econ.* 2003;12:3–16.
- [3] Loomes G. Valuing life years and QALYs: transferability and convertibility of values across the UK public sector. In: Towse A, Pritchard C, Devlin N, editors. *Cost effectiveness thresholds: economic and ethical issues.* London: BSC Print Ltd; 2002, p. 46–55.
- [4] Oliver A, Healey A, Donaldson C. Choosing the method to match the perspective: economic assessment and its implication for health services efficiency. *Lancet.* 2002;359:1771–1774.
- [5] Cookson R, Maynard A, McDavid D. Wrong SIGN, NICE mess: is national guidance distorting allocation of resources? *Br Med J.* 2001;323:743–745.
- [6] Basaza R, Alier PK, Kirabira P, et al. Willingness to pay for National Health Insurance Fund among public servants in Juba City, South Sudan: a contingent Evaluation. *Int J Equity Health.* 2017;16:158.
- [7] Jofre-Bonet M, Kamara J. Willingness to pay for health insurance in the informal sector of Sierra Leone. *PLoS One.* 2018;13: e0189915.
- [8] Nosratnejad S, Rashidian A, Akbari Sari A, et al. Willingness to pay for complementary health care insurance in Iran. *Iran J Public Health.* 2017;46:1247–1255.
- [9] Kesztyus D, Lauer R, Schreiber AC, et al. Parents' willingness to pay for the prevention of childhood overweight and obesity. *Health Econ Rev.* 2014;4:20.
- [10] Martín-Fernández J, del Cura-González MI, Rodríguez-Martínez G, et al. Economic valuation of health care services in public health systems: a study about willingness to pay (WTP) for nursing consultations. *PLoS One.* 2013;8:e62840.
- [11] Stone EM, McGinty EE. Public willingness to pay to improve services for individuals with serious mental illness. *Psychiatr Serv.* 2018;69:938–941.
- [12] Ochonma OG, Onwujekwe OE. Patients' willingness to pay for the treatment of tuberculosis in Nigeria: exploring own use and altruism. *Int J Equity Health.* 2017;16:74.

- [13] Dolan P, Olsen JA. Distributing health care. Economic and ethical issues. King's Lynn. Oxford: Oxford University Press, 2002.
- [14] Hamisu AW, Onyemelukwe GC, Eboh E, et al. The imperative of scaling up access to physiotherapy services for cases of acute flaccid paralysis in Nigeria. *Int J Med Sci Clin Invent*. 2017;4:3322–3327.
- [15] Onwujekwe O, Okereke E, Onoka C, et al. Willingness to pay for community-based health insurance in Nigeria: do economic status and place of residence matter? *Health Policy Plan*. 2010;25:155–161.
- [16] Liu S, Yam CHK, Huang HYO, et al. Willingness to pay for private primary care services in Hong Kong: are elderly ready to move from the public sector? *Health Polic Plan*. 2013;28:771–779.
- [17] Robinson R. Economic evaluation and health care: cost-benefit analysis. *Br Med J*. 1993;307:924–926.
- [18] Widström E, Seppälä T. Willingness and ability to pay for unexpected dental expenses by Finnish adults. *BMC Oral Health*. 2012;12:35.
- [19] Johannesson M, O'Connor RM, Kobelt-Nguyen G, et al. Willingness to pay for reduced incontinence symptoms. *Br J Urol*. 1997;80:552–562.
- [20] Aggarwal A, Sullivan R. Affordability of cancer care in the United Kingdom – Is it time to introduce user charges? *J Cancer Policy*. 2014;2:31–39.
- [21] Matthews D, Rocchi A, Wang EY, et al. Use of an interactive tool to assess patients' willingness-to-pay. *J Biomed Inform*. 2001;34:311–320.
- [22] Donfouet HPP, Essombe JRE, Mahieu PA, et al. Social capital and willingness-to-pay for community-based health insurance in rural Cameroon. *Global J Health Sci*. 2011;3:143–149.
- [23] Ataguba J, Ichoku EH, Fonta W. Estimating the willingness to pay for community healthcare insurance in rural Nigeria. 2008. Available at SSRN: <https://ssrn.com/abstract=1266163> or <http://dx.doi.org/10.2139/ssrn.1266163>
- [24] Mbachu C, Okoli C, Onwujekwe O, et al. Willingness to pay for antiretroviral drugs among HIV and AIDS clients in south-east Nigeria. *Health Expect*. 2018;21:270–278.
- [25] Rome A, Persson U, Ekdahl C, et al. Willingness to pay for health improvements of physical activity on prescription. *Scand J Public Health*. 2010;38:151–159.
- [26] Pakpour AH, Nourozi S, Molsted S, et al. Validity and reliability of Short Form-12 Questionnaire in Iranian hemodialysis patients. *Iran J Kidney Dis*. 2011;5:175–181.
- [27] Kim S-H, Jo M-W, Ahn J, et al. Assessment of psychometric properties of the Korean SF-12 v2 in the general population. *BMC Public Health*. 2014;14:1086.
- [28] Tan MLS, Wee HL, Salim A, et al. Validity of a revised Short Form-12 Health survey version 2 in different ethnic populations. *Ann Acad Med Singap*. 2016;45:228–236.
- [29] Dritsaki M, Petrou S, Williams M, et al. An empirical evaluation of the SF-12, SF-6D, EQ-5D and Michigan Hand Outcome Questionnaire in patients with rheumatoid arthritis of the hand. *Health Qual Life Outcome*. 2017;15:20.
- [30] Liu CJ, Latham NK. Progressive resistance strength training for improving physical function in older adults. *Cochrane Database Syst Rev*. 2009;(3):CD002759.
- [31] Nielsen JB, Gyrd-Hansen D, Kristiansen IS, et al. Impact of socio-demographic factors on willingness to pay for the reduction of a future health risk. *J Environ Plan Manag*. 2003;46:39–47.
- [32] Gan T, Sloan F, Dear Gde L, et al. How much are patients willing to pay to avoid postoperative nausea and vomiting? *Anesth Analg*. 2001;92:393–400.
- [33] Oyekale AS. Factors influencing households' willingness to pay for National Health Insurance Scheme (NHIS) in Osun State, Nigeria. *Ethno Med*. 2012;6:167–172.
- [34] Abate K, Worku A, Hussien S, et al. Association between socioeconomic status and willingness to pay for medical care among government school teachers in Addis Ababa. *Sci J Pub Health*. 2015;3:677–685.
- [35] Usman AB. Willingness to pay for community based health care financing scheme: a comparative study among rural and urban households in Osun State, Nigeria. *IOSR J Dental Med Sci*. 2013;5:27–40.
- [36] Rasch A, Hodek JM, Runge C, et al. Determinants of willingness to pay for a new therapy in a sample of menopausal-aged women. *Pharmacoeconomics*. 2009;27:693–704.
- [37] Franic DM, Pathak DS, Gafni A. Quality-adjusted life years was a poor predictor of women's willingness to pay in acute and chronic conditions: results of a survey. *J Clin Epidemiol*. 2005;58:291–303.
- [38] Hsieh RL, Lo MT, Lee WC, et al. Therapeutic effects of short-term monochromatic infrared energy therapy on patients with knee osteoarthritis: a double-blind, randomized, placebo-controlled study. *J Orthop Sports Phys Ther*. 2012;42:947–956.
- [39] Robinson V, Brosseau L, Casmiro L, et al. Thermotherapy for treating rheumatoid arthritis. *Cochrane Database Syst Rev*. 2002;(2):CD002826.
- [40] Zhang W, Robertson J, Jones AC, et al. The placebo effect and its determinants in osteoarthritis: meta-analysis of randomised controlled trials. *Ann Rheum Dis*. 2008;67:1716–1723.
- [41] Taylor PN, BurrIDGE JH, Dunkerley AL, et al. Patients' perceptions of the Odstock Dropped Foot Stimulator (ODFS). *Clin Rehabil*. 1999;13:439–446.
- [42] Koscielniak-Nielsen ZJ, Rassmussen H, Knud J. Effect of impulse duration on patients' perception of electrical stimulation and block effectiveness during axillary block in unседated ambulatory patients. *Region Anaesth Pain Med*. 2001;26:428–433.
- [43] McAdam J, Kenny LP, Nester C. Patients' perception of functional electrical stimulation (FES) for drop foot. *Clin Rehabil*. 2006;20:731–736.
- [44] Sand PK, Richardson DA, Staskin DR, et al. Pelvic floor electrical stimulation in the treatment of genuine stress incontinence: a multicentre placebo-controlled trial. *Am J Obstet Gynecol*. 1995;173:72–79.
- [45] Bello AI. Global overview of the models of physiotherapy practice: a need for integration towards better patients care. *Afr J Physiother And Rehabil Sci*. 2012;4:51–56.
- [46] Steidtmann D, Manber R, Arnow BA, et al. Patient treatment preference as a predictor of response and attrition in treatment of chronic depression. *Depress Anxiety*. 2012;29:896–905.
- [47] Leung J, Fereday S, Sticpewich B, et al. Factors influencing the overall satisfaction in patients with severe brain injury with physiotherapy services during inpatient rehabilitation. *J Head Trauma Rehabil*. 2018;33:E56–E63.
- [48] Wellay T, Gebreslassie M, Mesele M, et al. Demand for health care service and associated factors among patients in the community of Tsegedie District, Northern Ethiopia. *BMC Health Serv Res*. 2018;18:697.
- [49] Druss BG, Rosenheck RA, Stolar M. Patient satisfaction and administrative measures as indicators of the quality of mental health care. *Psychiatr Serv*. 1999;50:1053–1058.
- [50] Curtis JR, Deyo RA, Hudson RD. Health-related quality of life among patients with chronic obstructive pulmonary disease. *Thorax*. 1994;49:162–170.
- [51] Useh U, Boilane M. Assessment of the impact of physiotherapy on health related quality of life (HRQoL) of patients with arthritis in the Pretoria area of South Africa. *J Soc Sci*. 2011;29:17–21.
- [52] Abel JE, Hootman JM, Zack MM, et al. Physical activity and health related quality of life among people with arthritis. *J Epidemiol Commun Health*. 2005;59:380–385.