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DEVELOPMENT AND CLINIMETRIC TESTING OF WILLINGNESS TO PAY TOOL FOR PHYSIOTHERAPY

Chidozie E. Mbada, Sunday O. Mamud, Adesola C. Odole, John O. Omole, Olufemi O. Oyewole, Abiola O. Ogundele, Francis A. Fatoye

Abstract

Background: Lack of technical knowledge on Willingness to Pay (WTP) for health services may have contributed to paucity of WTP studies in physiotherapy.

Objective: To develop and establish psychometric properties of WTP for physiotherapy.

Methods: A WTP tool with five sections exploring information on socio-demographics, physiotherapy experience, satisfaction with physiotherapy, cost of physiotherapy services and patients' preferences for physiotherapy was developed. The WTP tool was completed on test-retest after one-week interval by 97 consenting physiotherapy out-patients. Intra-class correlation coefficient (ICC) with 95% confidence intervals and Cronbach's alpha (α) were used to assess the data for reliability and internal consistency.

Results: The tool's readability indicated a Flesch-Kincaid Grade Level and Reading Ease scores of 5.6 and 66.7, respectively. Intra-class correlation coefficient (ICC) for aggregate score of "patients' satisfaction" was "moderate" (0.644, $p < 0.05$) while the "cost of physiotherapy services" section was "excellent" (0.837, $p < 0.05$). The internal consistency of the "satisfaction with physiotherapy" (0.783, $p < 0.05$) and "cost of physiotherapy services" (0.911, $p < 0.05$) sections were "excellent". The stability of the **different sections of the instrument** over one week period, as reflected by the ICC, ranged from "poor" to "excellent". Also, the Cronbach's alpha and the ICC for the WTP characteristics were "poor" to "excellent", respectively.

Conclusion: The WTP tool for physiotherapy appears comprehensible and reliable among patients with chronic conditions attending physiotherapy. Availability of this WTP tool will promote studies examining the demand for physiotherapy services.

Key word: Willingness to pay; Physiotherapy; Psychometric properties; Tool development

Introduction

Willingness To Pay (WTP) in economic term refers to the maximum sum of money an individual is sacrificially willing to part with for services rendered, products procured or eluding something undesirable [1,2]. Also, WTP is a measure used to estimate a justifiable price for service received from a consumer's point of view and it helps to determine the economic value of services rendered to clients [3]. For example, WTP was used as a tool to determine the public perception about paying more for transportation in Bandung, Indonesia [2], and in other populations, it has been used to discern opinions on environmental public goods [4], environmental conservation [5] and conducive housing [6].

In health care, WTP has been employed as a tool to investigate demands by rural households for community-based health insurance, and the study's outcome was found useful as important evidence for policy makers and micro-insurance practitioners [7, 8]. Recently, there is increasing

support for the use of WTP methods in healthcare as a way to facilitate cost-benefit analysis [9] and measurement of benefits for healthcare providers [10], as well as, it being a proxy for measure of health state preferences [11]. In addition, the rising advocacy for the use of WTP in healthcare arose from the observation that health economics was left behind as compared with other sectors of economics such as environmental economics that have since embraced these methods [12, 13]. Consequent to the foregoing, sub-specialties in the health sector, such as, dentistry [14], nursing [12], community based health insurance [7,8], and mental health care [15] are embracing WTP studies. Conversely, there is an apparent dearth of WTP studies in medical rehabilitation and related disciplines as only one study to our knowledge has explored this concept for health improvement of physical activity participation [16].

Generally, there is lack of validated tool for WTP, as most authors have evolved their own tools without recourse to a gold standard. Nonetheless, few studies have attempted to establish the psychometric properties of their tools. For example, Severens et al [17] examined the construct validity of the WTP method for evaluating non-decisional diagnostic information. Whynes et al [18] tested the construct validity of contingent valuation, by eliciting women's valuations for the National Health Service (NHS) cervical cancer screening in the general population. Similarly, Foreit and Foreit [19] explored the theoretical and predictive validity of WTP survey tool for setting prices for reproductive health services in developing countries; while Healey and Chisholm [15] validated a WTP in mental health, by exploring in particular whether observed WTP estimates are in fact true measures of economic value. In the absence of studies and tools in physiotherapy, development and validation of WTP for physiotherapy is a verdant area for research. Therefore, the objective of this study was to develop and test the clinimetric properties of a WTP tool for physiotherapy.

Materials and Methods

Ethical consideration

Ethical approval was obtained from the Research Ethics Committee of the Institute of Public Health, Obafemi Awolowo University, Ile-Ife, Nigeria (HREC approval no: IPHOAU/12/781/Registered 13/03/2017) to conduct this study. Prospective participants were given verbal explanation about the purpose of the study. Informed written consent was obtained from participants willing to take part in the study.

Study design

This was a cross-sectional study.

Study location

This study was carried out at the physiotherapy out-patient clinics of the Obafemi Awolowo University Teaching Hospitals Complex (OAUTHC) (i.e. Ife Hospital Unit, Ile-Ife and Wesley Guild Hospital Unit, Ilesha). These tertiary hospitals are located in Osun State, South-western Nigeria.

Nigeria healthcare system

The health service delivery in Nigeria is organized and structured along the three tiers (local government, state and federal) of governance. These three levels are namely; primary, secondary and the tertiary health care. The management of the primary care is domiciled at the local

government areas, while the secondary and the tertiary levels of care are managed by the state and the federal governments, respectively. Provisions of health services at the all levels are not free, except for certain services, which at the discretion of government or based on their political priority are subsidized or bankrolled. Otherwise, patients pay for their health services largely through out-of-pocket or for some, through the national health insurance scheme [20].

The Nigeria National Health Insurance Scheme (NHIS) was established in 2004. The NHIS is aimed at making healthcare accessible and affordable for all Nigerians. The NHIS is a programme designed for those who are not currently covered under any health insurance premium and for those who may not have found satisfaction with the existing health care services [21]. As it stand, the Nigeria NHIS covers less than 10% of her population [20]. The NHIS obligate health providers to charge maximum of ₦1200/session for physiotherapy out-patient services and covers 12 sessions in a year. This translates to maximum of ₦14400/annum (\$40/annum). The enrolees have to pay the short fall out-of-pocket if incurred excess. However, the private clinics charges as much as ₦2000 to ₦5000 (\$5.56 – \$13.89) per session depending on the condition and location while the public hospitals charges between ₦1000 – ₦2500 (\$2.78 - \$6.94) per session. Most Nigerians are earning less than one dollar a day.

Respondents

Respondents in this study were recruited from patients attending adult out-patient physiotherapy clinics at Obafemi Awolowo University Teaching Hospital Complex, (Ife Hospital Unit and Wesley Guild Hospital, Ilesha), Osun State, Nigeria. The respondents were recruited using a purposive sampling technique. Eligible respondents were patients receiving physiotherapy intervention for any chronic condition (e.g. back/neck pain, stroke, cerebral palsy) for a minimum of eight treatment sessions who were not on a third party payer for services. Patients with any acute conditions, multiple co-morbidity and paediatric patients with their adult caregivers were excluded from the study.

Instruments

Willingness to pay questionnaire

This WTP in this study was developed from an earlier tool in a WTP study in Dentistry [22]. The questionnaire consists of five sections. Section one assesses information on socio-demographic such as age, sex, religion, marital status, ethnicity, education and income. Section two assesses physiotherapy experience and type of physiotherapy treatment received by the respondents. Satisfaction with physiotherapy was assessed in section three using a three-point Likert scale (agree, neutral and disagree). Least and maximum amount of money that could be paid for physiotherapy treatment and monetized health benefit were assessed in section four, while questions on how much respondents were willing to pay for five selected physiotherapy interventions were assessed on section five. Respondents were asked to select their WTP from a list of various price options. A follow up question was asked if the participants were not able to pay any amount or cannot pay between the ranges of option given. Furthermore, section five asked questions about participants' preferences and physiotherapy using a three-point Likert scale (agree, neutral and disagree). The Questionnaire was administered twice within a week interval to each respondents.

Data analysis

Data analysis was carried out using the Statistical Programme for Social Sciences (SPSS) version 22.0 (SPSS Inc., Chicago, Illinois, United States). Data were expressed as mean and standard deviations while frequency was expressed as a percentage. Inferential statistics using the intra-class correlation coefficient (ICC) with the 95% confidence intervals for each item and the subscale scores were used to examine test-retest reliability. ICC was used to judge how stable respondents' answers are over a time interval. ICC is the proportion of the total variance that exists in between-person and within-person variance over two administrations of one instrument. A greater between-person variance compared with within-person variance over test-retest of a tool is considered reliable [23], and an ICC ≤ 0.39 , $0.40 - 0.69$ and ≥ 0.70 is considered as weak or poor, moderate and excellent respectively. Furthermore, Cronbach's alpha (α) was used to evaluate internal consistency reliability, which is the degree to which related items measure the same concept. A Cronbach's alpha ≥ 0.07 was considered to have an excellent internal consistency.

Specifically, the ICC with the 95% confidence intervals (CI) were computed for the total WTP score. Readability test of the Willingness to pay tool was conducted using online software (<https://readability-score.com/members/verify/20170201ba0580715698d86711655cc4d>) [24]. For ease of understanding for international readers, we converted Naira to Dollar in our results at rate of ₦360 to a dollar.

RESULTS

Readability Test of the WTP tool

Table 1 shows the results of readability of the WTP tool which revealed a Flesch-Kincaid Reading Ease Score of 66.7 and Flesch-Kincaid grade level score of 5.6. Both the Flesch-Kincaid Reading Ease Score and the Grading Level Scores are instruments that measure literacy difficulty level. A Flesch-Kincaid score of 5.6 indicates that a minimum of a 5th-grade reading level is required to fully understand the contents of the survey while a Flesch-Kincaid Reading Ease score of 66.7 indicates that the test is relatively easy to comprehend as seen in Table 1.

Socio-demographic details of the respondents

The socio-demographic details of the respondents are represented in table 2. 51.6% of the total respondents in this study were aged 51 and above. Seventy (72.2%) respondents were observed to have a tertiary degree while 28 (28.9%) have a monthly income between ₦15,000 to ₦50,000 Nigerian Naira (\$41.67 to \$138.89).

Respondents' physiotherapy experiences

Respondents' clinical conditions, treatment experiences and physiotherapy utilization pattern of the respondents are presented in Table 2. All the respondents in this study have had previous physiotherapy experiences. Most of the respondents had neurological conditions (54.6%) while manual therapy was the most utilized treated approach (93.8%). The average treatment duration of the respondents was 6.5 ± 5.1 months.

Patients' preferences and satisfaction with Physiotherapy

Frequency distribution of responses on satisfaction with physiotherapy is presented in Table 3. Majority of the respondents were satisfied with overall care (96.5%), last visit (97.6%), personal aspects of care (95.2%) and, quality of care (97.6%). However, satisfaction with payment arrangement/fee schedule recorded the least (86.9%) satisfaction rate. There were no significant differences (p ranged = 0.177 – 1.000) in the ‘satisfied’ or ‘unsatisfied’ proportions among the respondents. Figure 1 shows the scatter plot of the correlation between overall satisfactions with physiotherapy services score on test and retest.

Frequency distribution of patients’ preference and physiotherapy is presented in Table 3. Most of the respondents (87.2%) preferred to pay for infra-red therapy than load a phone refill voucher, while 3.6% preferred to buy clothing than pay for an electrical stimulation session. There were no significant differences ($p > 0.05$) in responses to patients’ preference on test-retest basis. Figure 1 shows the correlation between test and retest frequencies of patients Preferences and Physiotherapy.

Test-Retest Reliability and Internal Consistency of the WTP tool

The Cronbach’s α and test-retest Interclass Correlation (ICC) for each variable are presented in Table 4. Intra-class correlation coefficient (ICC) for aggregate score of “patients’ satisfaction” was “moderate” (0.644, $p < 0.05$) while the “cost of physiotherapy services” section was “excellent” (0.837, $p < 0.05$). The internal consistency of the “satisfaction with physiotherapy” (0.783, $p < 0.05$) and “cost of physiotherapy services” (0.911, $p < 0.05$) sections were “excellent”. The aggregate score of professionalism scores on test 1 and test 2 were very consistent.

Cost of Physiotherapy services

Table 4 shows reliability criteria of variables such as satisfaction with Physiotherapy services, cost of Physiotherapy services, and Patients preference for Physiotherapy. Figure 1 shows the illustration of respondents overall cost patients are WTP for physiotherapy. It was deduced that most of the respondents were willing to pay less or about ₦5,000 (five thousand naira) [\$13.89] as against ₦9,600 (\$26.67) being paid monthly as shown by the clusters on the plot. This reflects 10 – 33% of median monthly earning.

DISCUSSION

This study advanced a WTP tool with its readability and psychometric properties. Despite the increasing relevance of WTP in the health sector, there is still an apparent dearth of studies utilizing WTP in physiotherapy. Hence, this is the first study to develop a WTP tool that is specific to physiotherapy with requisite clinimetric properties. The results of this study indicate that the WTP tool for physiotherapy evolved in this study has an acceptable and standard readability. Specifically, from the Flesch-Kincaid Ease Score of 66.7 and Flesch-Kincaid Level of 5.6 scores, it is implied that a pupil in the 5th grade level (a Junior Secondary School three (JSS 3)) can comprehend the contents of the tool. Thus, the tool is easy to read and comprehensible.

The WTP tool for physiotherapy developed in this study explored information on socio-demographics, physiotherapy experience of the patients, satisfaction with physiotherapy, cost of physiotherapy services and patients' preferences and physiotherapy. Based on literature review [25, 26], the different aspects of the WTP tool in this study were important to "WTP" construct and as such influence assessment of it. QuevedoI et al [27] submits that considerable number of multiple methodological issues involving WTP estimates exist in extant literature. However, the theoretical discussion about the aggregation of individual preferences within an aggregate demand remains open. Thus, it is recommended that psychometric evaluation of each WTP for physiotherapy assessment method be established.

Patients' satisfaction with treatment is a key factor in healthcare as it may be an indication of quality of services received by patients which also influence WTP assessment [28, 29]. Beattie et al [30] conducted a study in Sri Lanka and found that satisfaction with physical therapy services is associated with the type of facility, where patients in a private clinic were more satisfied than in a government hospital. However, the patients in this study fell within the "good" satisfaction category; this may be due to satisfaction with continuity of care as supported by May [31, 32]. One of the findings in the present study shows that the patients exhibited the lowest satisfaction with treatment payment and fee schedule, this is in line with a report by Casserley-Feeney et al [33] carried out in Ireland in 2008 supported the current finding, as their results demonstrated high levels of satisfaction with all components of physiotherapy treatment except cost. Our sample were willing to pay 41.7% of current physiotherapy charges/session (10 – 30 % of median monthly salary). Generally, people who were receiving physiotherapy for neurological conditions were willing to pay 30% of their earnings on monthly basis [34]. Relatively speaking, after paying utilities, food and housing bills; lesser amounts may be available for discretionary expenditures month-to-month. It is implied that other than the core attributes of patients' satisfaction, socio-economic status or economic earning may be important factors that influence WTP in this study.

The findings of this study indicated that there were no significant differences in the patients' preference for other services and physiotherapy when evaluated on two occasions. Majority of the patients accorded better preference for their therapies than using the same monies to pay for a haircut, mobile phone refill card, a drink, a sumptuous meal or to buy a clothing material. Preference for infra-red therapy was the highest among the patients in this study. Literature has shown that patients have preference for infra-red radiation even in the face of limited evidence for its efficacy [35]. The findings of this study demonstrated that the WTP for physiotherapy tool is internally consistent and reliable. The tool may be a valuable asset in the field of Physiotherapy in assessing WTP. The easy of readability and understanding makes the tool applicable to those who have lower educational qualification.

In summary, this study examined the readability, reliability and internal consistency of WTP tool for physiotherapy in Nigeria. The study employed a survey elicitation method (based on a tool that explored information on socio-demographic data, physiotherapy experience, satisfaction with physiotherapy, cost of physiotherapy services, patients preference and physiotherapy) using open and closed ended question to elicit WTP). The respondents were able to understand WTP questions and responded with high levels of internal consistency. Evidence supporting readability of the tool was also found in this study. The patients who responded in this study

were on average satisfied with physiotherapy treatment, thus eliminating, a significant influence of satisfaction on WTP assessment. Physiotherapy utilization was compared with some non-treatment alternatives in order to judge preference for physiotherapy utilization. The patients demonstrated good preferences for physiotherapy utilization than the comparable non-treatment alternatives. The patients however, showed somewhat non willingness to pay beyond a minimum of ₦5000. Thus, readability test of the WTP tool revealed it is easy to read and understood. In addition, this study found the willingness to pay for physiotherapy tool internal consistency and test-retest reliability of the WTP tool to be acceptable within the guidelines established for psychometric instruments [36].

Although the findings of the present study provide strong evidence for the stability and internal consistency of the instrument, follow-up studies are warranted to further establish the external validity of the instrument and the applicability of the instrument in other cultures. The current study was validated using chronic conditions; therefore, its findings may not be applicable to patients with acute conditions. The small unrepresentative sample in the study is another limitation which may limit the generalisability of the study. Since WTP may reflect ability to pay, we recommend :1) to examine whether preferences for physiotherapy-care differ systematically across different income groups through contingent valuation and 2) where they do, the sensitivity test of the end result should be assessed to determine the weights to be attached to WTP values given by those in different income groups [37]. However, Quevedo et al [27] submits that WTP concept is highly controversial in economic literature. On the one hand, its use has expanded enormously over the last 20 years in economic evaluations in the health area. On the other hand, the internal and external validity of such a tool is still questioned, both theoretically and methodologically.

CONCLUSION

The Willingness to Pay (WTP) tool for physiotherapy appears comprehensible and reliable among patients with chronic conditions attending physiotherapy.

RECOMMENDATIONS

The tool provided in this study may serve as preliminary instrument for physiotherapy researchers who are interested in conducting Willingness to Pay studies as it boasts requisite clinimetric properties as well as serve as a tool to assess patients satisfaction viz a viz the price paid for physiotherapy. Clinicians and policy makers are to be aware of the findings of the present study as the tool has the potential to be used to inform policy decisions to justify any price set for physiotherapy services.

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CONFLICT OF INTEREST: None.

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List of Figures

Figure 1: Scatter plot diagram showing the correlation between test and retest frequencies of patients' satisfaction, willingness to pay and Preferences for Physiotherapy services

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Table 1: Readability Test Analysis, Reading Ease score and Flesch Kincaid Grade level of the Willingness to Pay Tool

Readability indices	Score	School level (grade)	Notes
Flesch-Kincaid grade level	5.6	5 th	Very easy to read. Easily understandable by an average 11 year old student
Gunning-Fog score	8.6	8 th – 9 th	Easily understood by 8 th grade and high school freshman
Coleman-Liau index	13.4	13 th	Roughly appropriate for a first-year undergraduate
SMOG index	9.4	9 th	Plain English, Easily understood by 13 to 15 year old students

Readability indices	Score	School level (grade)	Notes
Automated readability index	5.2	5 th	Very easy to read. Easily understandable by an average 10 – 11 year old student
Average grade level	8.4	8 th	Plain English, Easily understood by 13 to 14 year old students
Flesch-Kincaid Reading Ease	66.7	8 th and 9 th	Plain English, Easily understood by 13 to 15 year old students
Spache score	3.1	3 rd	Easily understood by an average 3 rd grade student
New Dale-Chall score	5.4	5 th – 6 th	Easily understood by an average 5 th or 6 th -grade student
Text quality			
Passive voice count	16		
Adverb count	31		
Cliché count	0		
Reading time			
Reading time (minute)	3.41		
Speaking time (minute)	6.38		
Text statistics			
Character count	4,121		
Syllable count	1,445		
Word count	830		
Unique word count	288		
Sentence count	128		
Characters per word	5		
Syllables per word	1.7		
Words per sentence	6.5		

SMOG: Simple Measure of Gobbledygook.

Table 2: Respondents Socio-demographic characteristics and Physiotherapy experiences (n=97)

Variables	$\bar{x} \pm SD$	n(%)
Age (years)	50.2 ± 14.5	
Sex		
Male		48(49.5)

Female	49(50.5)
Marital status	
Single	19(19.6)
Married	76(78.4)
Separated	2(2.1)
Religion	
Christianity	83(85.6)
Islam	14(14.4)
Level of Education	
Primary	1(1)
Secondary	26(26.8)
Tertiary	70(72.2)
Ethnicity	
Yoruba	94(96.9)
Igbo	3(3.1)
Monthly Income (Nigerian Naira)	
Less than ₦7,500	1(1)
Between ₦7,500 – ₦15,000	24(24.7)
Between ₦15,000 – ₦50,000	28(28.9)
Between ₦50,000 – ₦100,000	17(17.5)
Between ₦100,000 – ₦150,000	7(7.2)
Between ₦150,000 – ₦200,000	8(8.2)
Above ₦200,000	12(12.4)
How long have you received Physiotherapy services	6.5±5.1
For what condition are you receiving physiotherapy?	
Musculoskeletal	44(45.4)
Neurological	53(54.6)
Type of physiotherapy treatment	
Thermotherapy	43(45.4)
Manual therapy	91(93.8)
Gym exercise and Fitness training	0(0)
Cryotherapy and/ Hydrotherapy	80(82.5)
Electrical Stimulation	59(60.8)
Indicate where you are receiving treatment	
This Public Hospital only	92(94.8)
Public and Private hospitals	1(1)
This public and home visit	4(4.1)

Table 3: Patient satisfaction with and Preference for Physiotherapy

Item	Test Preferred/satisfied n(%)	Retest Preferred/satisfied n(%)	χ^2	P
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Satisfaction					
	I am satisfied with overall care	81(96.5)	84(100)		
	I am satisfied with last visit	82(97.6)	82(97.6)	0.000	1.000
	I am satisfied with personal aspects of care	80(95.2)	83(98.8)	1.855	0.173
	I am satisfied with quality of care	82(97.6)	83(98.8)	0.339	0.560
	I am satisfied with care choices and options	83(98.8)	83(98.8)	0.000	1.000
	I am satisfied with my first appointment	81(96.5)	80(95.2)	0.149	0.699
	I am satisfied with continuity of care	81(96.5)	84(100)		
	I am satisfied with convenience of care	81(96.5)	83(98.8)	1.024	0.311
	I am satisfied with payment arrangement/fee scheduled	73(86.9)	70(83.3)	0.423	0.515
	I am satisfied with physical settings of the clinic	82(97.6)	81(96.5)	0.206	0.650
	I am satisfied with efficacy of care	83(98.8)	84(100)		
Preference					
	I would prefer to pay for a haircut than for massage	6(7.1)	3(3.6)	2.007	0.367
	I would prefer to pay for a infra-red therapy than load a recharge card or voucher	75(87.2)	73(86.9)		
	I would prefer to pay higher insurance premiums for general coverage of physiotherapy services	28(33.3)	24(28.6)	0.574	0.70
	I would prefer to pay for a cold drink than for a cold therapy or hydrotherapy	5(6.0)	7(8.3)	0.866	0.649
	I would prefer to pay for a sumptuous meal than for a Gym-exercise or fitness training	8(9.5)	4(4.8)	2.491	0.288
	I would prefer to buy clothings than pay for an electrical stimulation session	3(3.6)	2(2.4)	4.109	0.128

Table 4: Test-retest reliability of Respondents Willingness to pay characteristics

S/N	Variables	Cronbach's	Intraclass	95% Confidence
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		Alpha	Correlation (ICC)	Interval (CI)	
				Lower	Upper
1.	Satisfaction with Physiotherapy services	0.783	0.644	0.499	0.754
2.	Cost of Physiotherapy Services	0.911	0.837	0.753	0.894
3.	Patients preference for Physiotherapy	0.278	0.122	0.327	0.094

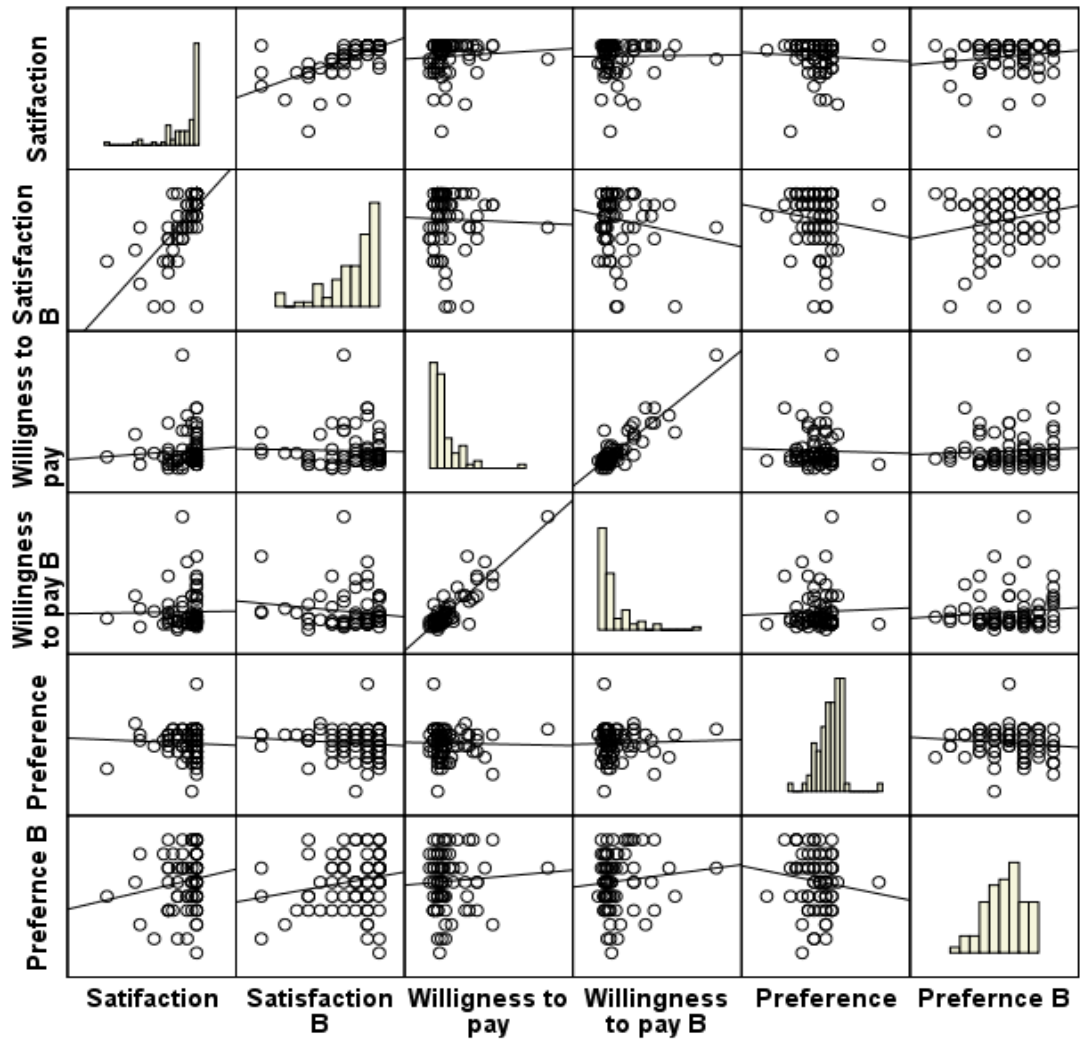


Figure 1: Scatter plot diagram showing the correlation between test and retest frequencies of patients' satisfaction, willingness to pay and Preferences for Physiotherapy services

Re-test overall WTP score