

Psychology of Patients Presenting for Various Ultrasound Investigations in Enugu, Nigeria

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ABSTRACT

Background: Patients frequently have misconceptions about ultrasound examinations, such as thinking they would know their results right away after their ultrasound, misinterpreting the medical necessity of the examination, thinking ultrasound imaging involves ionizing radiation, and thinking the cost of the investigation is too high. **Objective:** This study aimed to assess the psychology of patients presenting for ultrasound for various investigations in Speck Diagnostics, Enugu state, Nigeria. **Methods:** A questionnaire-based cross-sectional survey study was employed. Data analysis was done using SPSS version 23.0. A total of 200 responses from the online survey were collected and presented on a simple frequency table. **Results:** Most of the respondents were female 127(63.5%), while majority of them were between 31-40years and 41-50years representing 86(43.0%) and 51(25.5%) respectively. The majority of the respondents presented for obstetric ultrasound 70(35.0%). What first came to mind of the 101(50.5%) of the patients when referred for an ultrasound investigation were good treatment guides/diagnoses. The majority of the patients expressed fear 60(30.0%) and confusion 66(33.0%) when informed of the need to undergo an ultrasound investigation. The majority were most concerned about pain 60(30.0%) and discomfort 72(36.0%) during the procedure. the respondents agreed that their fears when referred for ultrasound investigations are related to the Cost of the procedure. The majority of the patients felt that their condition was very severe when referred for ultrasound investigation. Most of them feel anxious about their health condition when referred for an ultrasound investigation. Similarly, the majority of the patients were worried about cleanliness, fear about equipment being unsterile. The majority disagreed that the ultrasound investigation was a waste of money. Most of the patients expressed fear that severe illness might be diagnosed. **Conclusion:** No statistically significant correlation exists between the patient's psychology when referred for ultrasound investigation and their age as well as gender.

Keywords: *Psychology, Patient, Ultrasound, Diagnosis*

A patient is a person who receives healthcare services that are performed by trained healthcare professionals and are mostly ill or injured and in need of diagnosis or treatment by sonographers, physicians, nurses, optometrists, dentists and other

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healthcare professionals. Every patient is the most important member of the health care team and putting patients' needs first and allowing them to be the focal point and at the centre of the team will foster better patient management and better outcomes. Patients do come to the hospital or clinic for different reasons ranging from those that will present with illness, check-ups and routine visits while some patients may come looking to change treatment from one specialist to the other in a view to foster the treatment outcome^{1,2}.

There is rising evidence that a person's thinking may have measurable effects on physical recovery and their degree of faith in any medical evaluation⁴. These psychological effects may be influenced by the social backdrop, which may include the patients' relationships with their physicians, sonographers, nurses, and other healthcare professionals as well as their expectations of medical exams³. Psychologists that specialize in health employ psychological principles to advance wellness, stave against disease, and enhance medical care. They explore people's emotions at their core to assist them in making wise decisions. Despite this study, the advantages of these psychological and social influences continue to receive far less attention than medical interventions using drugs and devices. "Psychosocial" factors such as stress, hostility, depression and hopelessness seem associated with physical health, particularly heart disease⁴.

For a better understanding and quantification of patients' subjective perceptions of expectancies, connection, and trust, Crum and her co-authors called for a greater study examining the physical implications of these psychosocial components. According to Crum, the way medical professionals interact with their patients has a big impact on how well the patients respond to therapies and examinations^{5,6}.

In the majority of nations with modern health facilities, ultrasound is now a standard component of care for men and women of various ages. Ultrasound examinations are frequently connected to pregnancy. These scans can provide a pregnant woman the chance to see her unborn child for the first time. The exam does have a lot of additional applications, though. If a patient exhibits any signs that call for an inside examination of their organs, such as discomfort, swelling, or other symptoms, a doctor might recommend an ultrasound. An ultrasound can give a view of the following: testicles, uterus, ovaries, gallbladder, liver, kidneys, pancreas, spleen, thyroid, bladder, brain (in babies), eyes, and blood vessels. Using an ultrasound can also be useful for directing surgeon movement during some medical procedures, such as biopsies.

A transducer placed on the skin's surface is used to perform the majority of ultrasounds. Sometimes inserting a specific transducer into one of the body's natural holes might produce a better diagnostic image: An ultrasound transducer probe is inserted into a woman's vagina to get pictures of her uterus and ovaries using transvaginal ultrasonography. A transducer probe is inserted into the rectum during transrectal ultrasonography to help diagnose prostate problems. A transducer probe is inserted into the oesophagus during a trans-oesophageal echocardiography to get pictures of the heart.

Patients frequently have misconceptions about ultrasound examinations, such as thinking they would know their results right away after their ultrasound, misinterpreting the medical necessity of the examination, thinking ultrasound imaging involves ionizing radiation, and thinking the cost of the investigation is too high. Others think that being referred for an ultrasound means their condition is too serious. A small number of patients may even be misinformed about the risks associated with ultrasound examinations and this will

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overshadow the medical necessity of the examination and could result in patients being psychologically unprepared to deal with perceived negative outcomes⁷.

In research by Starcevich *et al.*, the patient's comprehension of and expectations for ultrasound imaging and its safety, providers of examination information, and degrees of examination anxiety were determined. Participants had erroneous expectations about the outcome of the ultrasound examination and misconceptions about the safety of ultrasonography and some of these beliefs may well be clarified by the sonographer before the ultrasound examination began.⁸

Additionally, mindsets can have unfavourable impacts, or "nocebo," For instance, it has been seen that patients' pain thresholds increase when they are told they will receive an ultrasound scan. The likelihood of adverse ultrasound effects increased in individuals who were informed about them. The objectives of psychological evaluation are to identify a person's potential cognitive and emotional reactivity issues, as well as their strengths and shortcomings, and to provide recommendations for possible solutions. This research aimed to assess the psychology of patients for ultrasound for various investigations.

MATERIALS AND METHODS

Research Design

The research design employed in this study was a questionnaire-based cross-sectional design where the researcher analyzed data of variables collected at one given point in time across a sample population or a predetermined subset.

Target Population

The study was focused solely on patients presenting for ultrasound examinations in Speck Diagnostics, Enugu, Nigeria within the study period.

Sample Size

The sample size for this study was calculated using the Taro Yamane formula with a 95% confidence level,

$$n = \frac{N}{1 + Ne^2}$$

Where n= sample size.

N = population size

e = sampling error assumed as 0.05

N= 400

n = 400/1+400(0.05)²

n = 200

A total of 400 patients came for an ultrasound scan in Speck Diagnostics within the time of study and out of the 400, only 200 patients were referred by health/medical practitioners and were willing to fill the questionnaire.

Sampling Technique

A simple random sampling technique was used to select some patients presenting for ultrasound examinations for various studies.

Inclusion Criteria

- Participants or respondents are patients undergoing ultrasound examinations at Speck Diagnostics.

Exclusion Criteria

- Patients undergoing other radiological examinations at Speck Diagnostic, Enugu, Nigeria.
- Paediatric patients undergoing ultrasound examination but cannot respond to the questionnaire.
- Geriatric patients undergoing ultrasound examination but cannot respond to the questionnaire.
- Unconscious or patients under emergency presenting for ultrasound examinations at Speck Diagnostics.

Tools for Data Collection

The research tool used was a validated questionnaire.

Method of Data Collection

Data was collected from participants through the use of questionnaires which were used to assess the psychology of patients presenting for various ultrasound examinations.

Method of Data Analysis

Data was analyzed using both descriptive and inferential statistics. The descriptive statistics- frequency and percentage were used to summarize the items in the questionnaire. Inferential statistics- Spearman correlation was also used to ascertain the psychology of patients presenting for various ultrasound examinations at a 5% level of significance. The statistics were done using Statistical Package for Social Sciences (SPSS), version 23 and Microsoft Excel.

Ethical Statement

Ethical approval for this study was obtained from the ethical committee at the ethical unit of Speck Diagnostics, Enugu, Nigeria. All participants' information obtained was also treated with a high level of confidentiality and used strictly for this study.

Data Availability Statement (DAS)

The generated raw data supporting the findings of this study is available on request.

Funding

No funding was received for this research work.

Conflict of Interests

The authors declare no competing interest.

RESULTS

A total of 200 responses from the online survey were collected and presented as follows;

Table 1.0 socio-demographic information

VARIABLES	OPTIONS	FREQUENCY (n)	PERCENT(%)
Gender	Male	73	36.5
	Female	127	63.5
	Total	200	100.0
Age	18-20	5	2.5
	21-30	15	7.5
	31-40	86	43.0
	41-50	51	25.5
	51-60	43	21.5
	Total	200	100.0
	Examinations	Obstetrics ultrasound	70
Gynecological ultrasound		61	30.5
General abdominal ultrasound		40	20.0
Small parts		29	14.5
Total		200	100.0

Table 1.0 above showed that most of the respondents were female 127(63.5%), while the majority of them were between 31-40 years and 41-50 years representing 86(43.0%) and 51(25.5%) respectively. The majority of the respondents presented for obstetric ultrasound 70(35.0%).

Table 2.0 Patients' fears when referred for ultrasound investigation.

s/n	Questions and responses	Frequency(n)	Percent (%)
1.	what first came to your mind when you were referred for an ultrasound investigation?		
	Good treatment guide/ diagnosis	101	50.5
	Financial inconveniences	62	31.0
	Critical health condition	13	6.5
	The investigation is unnecessary for the treatment	24	12.0
	Total	200	100.0
2.	What is your initial emotional reaction when informed that you need to undergo an ultrasound investigation?		
	Fear	60	30.0
	Anxiety	22	11.0
	Indifference	17	8.5
	Happy	35	17.5
	Confusion	66	33.0
	Total	200	100.0
3.	What specific aspects of the ultrasound investigation concern you the most?		
	Fear of the results	23	11.5
	Fear of the unknown	31	15.5

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s/n	Questions and responses	Frequency(n)	Percent (%)
	Concerns about the procedure being painful	60	30.0
	Anxiety about the potential diagnosis	14	7.0
	Discomfort during the procedure	72	36.0
	Total	200	100.0

Table 2.0 above indicates that what first came to mind of the 101(50.5%) of the patients when referred for an ultrasound investigation was a good treatment guide/diagnosis. The majority of the patients expressed fear 60(30.0%) and confusion 66(33.0%) when informed of the need to undergo an ultrasound investigation. The majority were most concerned about pain 60(30.0%) and discomfort 72(36.0%) during the procedure.

Table 3.0 Patient Psychology when referred for ultrasound examination.

QUESTIONS	SD n(%)	D n(%)	U n(%)	A n(%)	SA n(%)	Mean score
Your fears when referred for ultrasound investigations are related to the cost of the procedure?	7(3.5)	10(5.0)	27(13.5)	100(50.0)	56(28.0)	3.94
Your fears when referred for ultrasound investigations were that you felt your conditions were very severe.	8(4.0)	35(17.5)	35(17.5)	86(43.0)	6(18.0)	3.54
I feel anxious about my health condition	2(1.0)	43(21.5)	26(13.0)	59(29.5)	85(28.0)	3.62
I feel worried about cleanliness, fear about equipment being unsterile	5(2.5)	44(22.0)	36(18.0)	62(31.0)	53(26.5)	3.57
I feel bad because I know it is a waste of money	62(31.0)	50(25.0)	33(16.5)	12(6.0)	43(21.5)	2.48
I had the fear that severe illness might be diagnosed	18(9.0)	29(14.5)	27(13.5)	76(38.0)	50(25.0)	3.56
I did not feel anything	61(30.5)	55(27.5)	31(15.5)	27(13.5)	26(13.0)	2.51

Note: Scores were assigned to the answers as follows 1= Strongly Disagree (SD), 2= Disagree (D), 3= Neutral (U), 4=Agree (A), 5=Strongly Agree (SA).

Interpretation: Mean score of 1.0–1.8= Strongly Disagree (SD), 1.8-2.6 = Disagree(D), 2.6-3.4 = Neutral(U), 3.4-4.2 = Agree(A) while 4.2-5= Strongly Agree (SA).

As contained in Table 3.0 above, the respondents agreed that their fears when referred for ultrasound investigations are related to the cost of the procedure (mean score = 3.94). The majority of the patients felt that their condition was very severe when referred for ultrasound investigation (mean score = 3.54). Most of them feel anxious about their health condition when referred for ultrasound investigation (mean score = 3.62). Similarly, the majority of the patients were worried about cleanliness, and fear about equipment being unsterile (mean score = 3.57). The majority disagreed that the ultrasound investigation was a waste of money (mean score = 2.48). Most of the patients expressed fear that severe illness might be diagnosed (mean score = 3.56).

Table 4.0 Correction between patient's psychology and their age and gender

Variables	Patients' Psychology	
Gender	Correlation Coefficient	0.054
	P-value	0.451
	N	200
Age	Correlation Coefficient	-0.047
	P-value	0.508
	N	200

Correlation is significant at the 0.05 level.

Table 4.0 above revealed that no statistically significant correlation exists between the patient's psychology when referred for ultrasound investigation and their age as well as gender (P-values >0.05).

DISCUSSION

A total of 200 responses from the survey were collected and presented on a simple frequency table. The result indicates that most of the respondents were female 127(63.5%), while the majority of them were between 31-40 years and 41-50 years representing 43.0% and 25.5% respectively. The majority of the respondents presented for obstetric ultrasound 70(35.0%).

To document patient fears when referred for ultrasound investigations:

Findings from the study indicate that what first came to mind of the majority of the patients when referred for an ultrasound investigation was a good treatment guide/ diagnosis 101(50.5%). This is contrary to the work done by Kravitz⁵¹ which states that referral for a test could increase patient concern and fears that the symptoms indicate a serious illness. Also, the findings showed that although, the majority of the patients expressed that what first came to their mind when referred for ultrasound investigation was a good treatment guide/ diagnosis, only a few of the patients were happy when informed of the need to undergo an ultrasound investigation 35(17.5%). The majority were most concerned about pain 60(30.0%) and discomfort 72(36.0%) during the procedure, this agrees with the findings of Krystyna *et al.*,⁵² which recorded the level of pain perception in patients undergoing Phacoemulsification Cataract Surgery at a moderate level.

To categorically document the patients' psychology when referred for ultrasound investigation:

Findings from the study show that the respondents agreed that their fears when referred for ultrasound investigations are related to the cost of the procedure (mean score = 3.94), this agrees with the findings of Ikeako *et al.*,⁵³ which states that 60.1% (125/208), mainly civil servants, expressed the views that ultrasound in pregnancy is costly, while 24.4% (59/208) felt it is cheap, 9.1% (19/208) said it is very costly, while the remaining 2.4% (5/208) thought it is not affordable. The majority of the patients felt that their condition was very severe when referred for ultrasound investigation (mean score = 3.54), this is in line with the findings of the work done by Chojniak *et al.*,⁵⁴ which shows that the prevalence of anxiety is high among patients awaiting diagnostic procedures. Most of them feel anxious about their health condition when referred for ultrasound investigation (mean score = 3.62), this agrees with the study done in Ghana Antwi *et al.*,⁵⁵ which concluded that ill-informed ultrasound patients were more likely to have significantly increased levels of anxiety regarding their examination. Similarly, the majority of the patients were worried about cleanliness, and fear about equipment being unsterile (mean score = 3.57). The majority disagreed that the

ultrasound investigation was a waste of money (mean score = 2.48). Most of the patients expressed fear that severe illness might be diagnosed (mean score = 3.56). This is in line with the work done by Forshaw *et al.*,⁵⁶ which states that raised anxiety is common before medical imaging procedures and is mostly attributed to the possible results. The finding also agrees with the findings of the work done by Starcevic *et al.*,⁸ which states that Participants had erroneous expectations about the outcome of the ultrasound examination.

To determine if any correlation exists between patients' age as well as gender and their fears when referred for ultrasound investigation:

Findings from the study revealed that no statistically significant correlation exists between the patient's psychology when referred for ultrasound investigation and their age as well as gender (P-values >0.05). This is contrary to the findings of Ekelin *et al.*,⁴⁵ which states that Women reported higher levels of worry, state and trait anxiety, and coherence before the ultrasound than did males, suggesting that women and men's psychological well-being is altered by a normal ultrasound examination. This was also refuted by the findings of Forshaw *et al.*,⁵⁶ which states that Female gender was statistically significantly associated with raised anxiety levels. The finding stated that no statistically significant correlation exists between the patient's psychology when referred for ultrasound investigation and their age, this agrees with the findings of Seda and Özlem⁵⁷ which state that there was a negative correlation between the age of the patients and the fear of medical procedures.

CONCLUSION

Understanding and addressing the psychological aspects of patients undergoing ultrasound investigations contribute to a more patient-centred and compassionate healthcare environment. Many patients experience anxiety and apprehension before ultrasound examinations due to fear of potential findings or concerns about the procedure itself. Healthcare providers should acknowledge and address these anxieties through effective communication and reassurance. Clear and empathetic communication is essential in preparing patients for ultrasound investigations. Healthcare professionals should explain the procedure, expected duration, and purpose of the examination in a language that patients can understand, addressing any concerns or questions they may have. Patients' fears and psychology when referred for ultrasound investigation are not statistically correlated with the patient's age, and gender.

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