

# Patients' Perception and Attitude to Surgical Amputation in Makurdi, North Central Nigeria

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## Abstract

**Background:** There has been a global rise in surgical amputations because of vascular complications of diabetes mellitus, among other factors. About 22% of patients usually decline or delay consent for the operation leading to poor outcomes. **Objective:** This study aimed to determine patients' perceptions and attitudes toward surgical amputation and amputee prosthesis. **Methods:** A cross-sectional study was conducted over 12 months during which a semi-structured questionnaire was administered to adult patients attending the outpatient clinic at Benue State University Teaching Hospital. The questions assessed the patient's knowledge, attitude, and behavior toward amputation, amputees, and amputee prosthesis. **Results:** Out of 400 respondents, 320 (80%) agreed that surgical amputation is beneficial, 232 (58%) agreed that it is done to remove a dead limb, whereas sixty-five (16.2%) think that amputation is done on every leg that has a fracture. The majority of 360 (90%) were willing to encourage others to have an amputation to save a life. This was found to be significantly related to religion ( $P = 0.000$ ), educational status ( $P = 0.000$ ), and sex ( $P = 0.044$ ). Reasons for refusal of amputation were fear of losing a limb (106, 26.5%) and deformity (93, 23.2%). Three hundred and three (78.2%) respondents were aware of artificial limbs, and 342 (85.5%) regard doctors as lifesavers. **Conclusion:** There is a high level of awareness and knowledge of indications for surgical amputation which is significantly influenced by religious beliefs, educational status and gender. Education on preventive measures may reduce amputation rates. The provision of a functional prosthesis will hope for productivity after limb loss.

**Keywords:** Amputation, attitude, Makurdi, perception, prosthesis

## INTRODUCTION

Amputation is the removal of a limb or part of a limb by cutting through bone. It is one of the oldest surgical procedures with a history of over 2500 years and dates back to the time of Hippocrates, the father of medicine.<sup>[1]</sup> It is a disfiguring surgical procedure with immense economic, social, and psychological effects on the patient and their families.<sup>[2]</sup> Despite this, it is one of the most commonly performed surgical procedures with 185,000 performed each year worldwide.<sup>[3]</sup> This is because the consideration of saving the life of the patient is usually placed above that of a limb or even both limbs when they are dead, dying, or constitute a damn nuisance.<sup>[4-6]</sup> Furthermore, the possibility of offering the patient an artificial limb that has the potential to perform some of the limb's function as well as restore body image makes this difficult decision easier for the surgeon.

A multidisciplinary collaboration between orthotists, podiatrists, plastic surgeons, vascular surgeons, and orthopedic surgeons

has been formed in countries such as the USA and the UK to prevent or reduce the amputation rate.<sup>[4]</sup> This is achieved through education on preventive measures. The provision of limb-saving surgeries such as re-implantation, vascular bypass operations, and wound care for early diabetic foot ulcers is carried out by this team.<sup>[4,5]</sup> Orthopedic surgeons also engage in limb reconstruction surgeries using the Ilizarov technique for some salvageable major limb injuries. These interventions are usually possible when the patients present early. When they present late, sometimes amputation becomes the only lifesaving option.

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Surgical amputation is performed for various reasons. These include trauma, bone, and soft-tissue sarcomas, complications of diabetes such as diabetic foot gangrene, peripheral vascular disease (Buerger's disease and Raynaud's phenomenon), congenital malformations, sepsis, and gangrene following circumferential limb burns.<sup>[2]</sup> The indications also vary from one country to another, and even in the same country, it may vary from region to region due to variation in predominant predisposing factors. The prevalence of diabetes doubled between 1990 and 2002 in the US from 6.7 million to 13.3 million.<sup>[5]</sup> That made diabetes to become the leading nontraumatic indication for amputation in America. In 1997, a total of 84,000 patients had lower extremity amputations for complications of diabetes mellitus. The total annual surgical amputation figure in the USA has remained higher than 80,000 since then.<sup>[6]</sup> In the year 2015, 14.2 million Africans were diagnosed with diabetes mellitus and 34.2 million people have been projected to be diabetic by the year 2040.<sup>[7]</sup>

A review article on extremity amputations in Nigeria in 2007 estimated the prevalence rate of extremity amputation to be 1.6 per 100,000.<sup>[8]</sup> According to the study, the most frequently encountered indication for amputation in Nigeria was trauma (34%). This was closely followed by complications arising from traditional bone setter's intervention (23%). Other reasons for limb ablations were malignant tumors (14.5%), diabetic foot gangrene (12.3%), and infections (5.1%). The least frequent indications were peripheral vascular diseases (2.1%) and burns (2.1%). These findings were corroborated by other similar studies.<sup>[9-11]</sup> However, there appears to be a change in trend in the last decade with diabetic foot disease becoming more prominent and in some cases overtaking trauma as the most frequent indication for amputation.<sup>[12-14]</sup>

Perception is the way something is regarded, understood, or interpreted, whereas attitude refers to one's predisposition or tendency to respond positively or negatively toward a certain idea, object, person, or situation. Perception and attitude to surgical amputation vary between and within countries because of variations in cultural and religious beliefs.<sup>[1]</sup> This may be responsible for some patients refusing or delaying consent for amputation, which could have saved their lives. There are few studies about the perception and attitude of Nigerian patients to amputation. The risk for surgical amputation is increasing in proportion to the rising prevalence of diabetic foot disease, peripheral vascular disease, and crush limb injuries from high-speed travels.<sup>[15,16]</sup> Delay or refusal of consent for amputation jeopardizes the lives of these patients even after the amputation. As many as 22% of patients who need amputation decline consent for it even when they are told their life is at risk.<sup>[4,5]</sup>

This study aims to assess patients' understanding of surgical limb amputation and also determine their attitude toward amputees and surgeons who perform this procedure. This information will equip the surgeons and other health-care

providers when obtaining consent for this operation. There is also a need to determine the knowledge of our patients about amputation prosthesis for amputee rehabilitation so that they can be counseled properly when the need arises.

## METHODS

A cross-sectional study was conducted during which a semi-structured questionnaire was administered to adult patients (18 years and above) attending the outpatient clinic at the Medical Outpatient Department and Orthopaedics and Trauma Units of Benue State University Teaching Hospital, Federal Medical Centre (FMC) Makurdi, NKST Rehabilitation Center (located in a semi-urban area) and Peniel hospital Gboko from September 2018 to August 2019. All consecutive respondents (convenience sampling) who met the inclusion criteria were recruited. The respondents were adequately briefed on the aims and objectives of the study, and their confidentiality was guaranteed by excluding their names on the questionnaire. A signed consent form was also obtained from each of them. A pilot testing of the questionnaire was done which led to the modification of some questions. Approval for the study was obtained from the Health Research Ethics Committees of the FMC and the teaching hospital. Apart from demographic information, the questionnaire focused on the knowledge and attitude toward amputation, the influence of cultural and religious beliefs on amputation, the use of artificial limbs as well as regards for amputees, and the surgeon who perform an amputation. The questionnaire was adapted from a previous study in Calabar.<sup>[17]</sup>

The sample size was determined as follows:

Margin of error = 5%, confidence level = 95%, population size = 20,000, response distribution = 50%.

The sample size  $n$  and margin of error  $E$  are given by

$$x = Z (c/100) 2r (100 - r)$$

$$n = N x / ([N - 1]E^2 + x)$$

$$E = \sqrt{([N - n]x / n [N - 1])}$$

Where  $N$  is the population size,  $r$  is the fraction of responses that one is interested in, and  $Z (c/100)$  is the critical value for the confidence level  $c$ . The recommended sample size was calculated to be 377 by Raosoft Incorporation: Raosoft Sample Size Online Calculator (Available from: <http://www.raosoft.com/samplesize.html>). However, 450 respondents were recruited eventually, because some did not fill the questionnaires properly.

Data were analyzed using the software Statistical Package for the Social Sciences for Windows version 21.0 (SPSS Inc.; Chicago, IL, USA). Descriptive statistics were used to display single-variable quantities using means and standard deviations for continuous variables or proportions for categorical variables unless otherwise stated. The results were displayed in tables and charts.

## RESULTS

There were 400 respondents out of 450 respondents who completed the questionnaires and returned them, giving a completion rate of 88.8% and an attrition rate of 11.2%. The respondents comprised of 215 (53.8%) males and 185 (46.2%) females, giving a male to female ratio of 1.2:1. The predominant tribes were Tiv (292, 73%), Idoma (46, 11.5%), Igbo (22, 5.5%), and Igede (15, 3.8%). Their occupations were students (114, 28.5%) and civil servants (95, 23.8%) [Table 1]. Three hundred and ninety-one (97.8%) were Christians and 9 (2.2%) were Muslims. The age range was 18–90 years with a mean age of  $36.9 \pm 14.1$  years.

The assessment of the respondents' knowledge of reasons for surgical amputation shows that 344 (86%) agreed that an amputation is a treatment option in surgical management and 65 (16.2%) believed that amputation is done on every leg that has a fracture [Table 2]. This was found to be significantly related to their educational status ( $\chi^2 = 15.089$ ,  $df = 6$ ,  $P = 0.015$ ) [Table 3].

The attitudinal disposition of the respondents to surgical amputation reveals that 360 (90%) are willing to encourage others to amputate if their life is to be saved by it. This was found to be significantly related to religion ( $\chi^2 = 16.755$ ,  $df = 2$ ,  $P = 0.000$ ) and sex ( $6.229$ ,  $df = 2$ ,  $P = 0.044$ ). Christians and the male gender, respectively, were more receptive to surgical amputation. Two hundred and eighteen (54.5%) respondents believed that our society is receptive to amputation and 301 (75.2%) were willing to encourage their relation to marry an amputee. Three hundred and twenty (80%) respondents agreed that amputees were humans with potentials, 40 (10%) were not sure, and 40 (10%) did not respond [Figure 1]. Nineteen (4.8%) believed that amputation is a punishment for the sins of the individual. There was a significant relationship between this attitude and the educational status of the respondents with those with secondary and tertiary education more receptive ( $\chi^2 = 34.597$ ,  $df = 2$ ,  $P = 0.000$ ).

As regards what the respondents would do if a doctor should suggest the need for amputation as a means of treatment, 245 (61.2%) said that they had no alternative to amputation, 89 (22.2%) would rather die than have an amputation, 25 (6.2%) were not sure of what they will do, 9 (2.2%) would go for traditional treatment, 11 (2.8%) did not respond, and 17 (4.2%) gave various other responses to this semi-structured question.

The respondents' reasons why people refuse amputation even when the doctor says it is necessary were fear of losing a limb (106, 26.5%), deformity (93, 23.2%), stigma (57, 14.2%), ignorance (38, 9.5%), fear of death (12, 3.0%), financial constraints (9, 2.2%), traditional treatment is better (7, 1.8%), pain (3, 0.8%), fear of the unknown (2, 0.5%), culture and religious beliefs (2, 0.5%), not sure (4, 1%), personal reasons (4, 1%), and other comments (29, 7.2%). No response was in recorded (34, 8.5%).

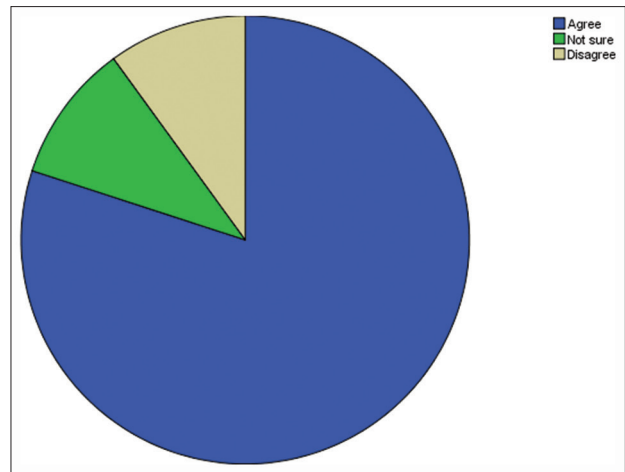


Figure 1: Respondents' attitude to amputees in Makurdi

Table 1: Demographic composition of respondents of a survey on perception and attitude of patients towards surgical amputation in Makurdi, Benue state

Occupation	Frequency (N=400)	%
Students	114	28.5
Civil servants	95	23.8
Business	51	12.8
Farmer	43	10.8
Applicant	24	6.0
House wife	14	3.5
Teacher	14	3.5
Retiree	11	2.8
Clergy	9	2.2
Driver	5	1.2
Nurse	5	1.2
Lawyer	3	0.8
Artisan	3	0.8
Others	9	2.25
<b>Educational status</b>		
Nil/Primary	35	8.8
Secondary/Tertiary	365	91.2
<b>Tribe</b>		
Tiv	292	73.0
Idoma	46	11.5
Igbo	22	5.5
Igede	15	3.8
Itenge	8	2.8
Igala	6	1.5
Others	11	2.8

Three hundred and three (78.2%) respondents were aware of artificial limbs, 85 (21.2%) were not aware, whereas 2 (0.5%) did not respond. This was significantly related to their educational status ( $\chi^2 = 6.903$ ,  $df = 2$ ,  $P = 0.032$ ). Two hundred and seventy (67.5%) had correct knowledge of the uses of artificial limbs, 118 (29.5%) had incorrect knowledge, and 12 (3.0%) did not respond.

**Table 2: Perceptions of respondents about surgical amputation in Benue state**

	Agree	Not Sure	Disagree	Total %
Amputation is a treatment option in surgical management	344 (86.0)	27 (6.8)	29 (7.2)	400 (100)
Surgical Amputation is beneficial	320 (80.0)	46 (11.5)	34 (8.5)	400 (100)
Surgical amputation is done to save life	368 (92.0)	22 (5.5)	10 (2.5)	400 (100)
Surgical amputation is done on a dead limb	232 (58.0)	101 (25.2)	67 (16.8)	400 (100)
Amputation is done on every limb that has a fracture	65 (16.2)	69 (17.2)	266 (66.5)	400 (100)
Surgical amputation is done to remove a limb that has cancer	238 (59.5)	103 (25.8)	59 (14.8)	400 (100)

**Table 3: Perception of respondents to surgical amputation as regards their educational status**

Educational Status	Amputation is done on every limb that has a fracture			Total
	Agree	Not sure	Disagree	
Nil	7	5	9	21
Primary	3	5	8	16
Secondary	14	11	31	56
Tertiary	41	47	219	307
Total	65	68	267	400

*P*-value=0.015

The response to the question “how do you regard doctors that amputate limbs” was they are lifesavers (342, 85.5%), indifferent to patients plight (9, 2.2%), people who enjoy cutting limbs (4, 1%), and other responses (19, 4.8%). There was no response in 26 (6.5%).

## DISCUSSION

This study shows that the majority (86%) of the respondents know amputation as a treatment modality in the surgical management of patients. Furthermore, 80% know that it is done to save a life. This is lower than 90% recorded in a similar study conducted in Calabar.<sup>[17]</sup> This may be due to the diversity in the sampled population. In Calabar, only the teaching hospital located in the metropolis was sampled, whereas the current study involved four centers; three in urban areas and one in a semi-urban area. The more educated respondents are more likely to be found in urban areas. This study has established a correlation between educational status and knowledge of amputation (*P* = 0.015).

As regards the understanding of the reasons why doctors who are trained to save lives and limbs sometimes opt for amputation of limbs, 58% agreed that it could be indicated when a limb is dead, 59% knew that it is indicated in the treatment of cancerous limbs, whereas 16.2% erroneously thought that amputation is done on every fractured limb that is brought to the hospital for treatment. This is similar to the findings in an earlier study where 42% agreed that it was indicated to remove a dead limb.<sup>[17]</sup> The wrong impression observed in 16.2% of our respondents that orthodox treatment of fractures involves amputating every fractured limb may be one explanation why some patients leave against medical advice when they are told they have a fracture.<sup>[16-20]</sup> There is a need to enlighten the public on the fact that amputation is the last option on the surgical

armamentarium of the trauma surgeon.<sup>[21]</sup> It is deployed only when all other options are considered inappropriate.

People's attitude to amputation has origins in their cultural and religious beliefs which date back to ancient times. In some religions, it is a form of punishment for a certain category of criminals and so stigmatization can arise from it.<sup>[16,17]</sup> When amputation is offered as the only treatment option from the surgeon's point of view, 90% were willing to encourage others to undergo the operation if their life will be saved by it. This is higher than 75% recorded in an earlier study.<sup>[17]</sup> This disposition was found to be significantly influenced by religion (*P* = 0.000). Given this strong association with religion, there may be a need to involve the religious leaders of some patients to facilitate consent for amputation. This may reduce the unnecessary delay that negatively affects the outcome. However, only 61.2% of the respondents were willing to consent to the operation if they were the ones involved, whereas 22.2% said that they would rather die than accept amputation. This is higher than 10% reported as respondents who preferred death to amputation when similar studies were conducted in both Calabar and Lagos.<sup>[17,18]</sup> However, it is similar to 22% documented in another study conducted among patients counseled for amputation in Kenya.<sup>[15]</sup> This strong aversion to amputation among the respondents may be due to fear of deformity, stigmatization, and change in body image that follows amputation. Amputation was used as a ritual in some cultures and as a punitive measure in others.<sup>[17,18]</sup> Some people believe that it occurs during reincarnation and would rather die and be buried with their body parts complete.

Furthermore, the concept of body image has to do with the way an individual feels their body image affects their interactions with people.<sup>[23,24]</sup> It is the mental picture people have of themselves and believe others have of them.<sup>[24]</sup> This

plays a role in their social and interpersonal relationships. Therefore, when confronted with the need for a permanent change on account of amputation, it is usually difficult for them.<sup>[24]</sup> A study in Lagos has also shown that only 17.9% of the amputees were able to return to their initial work and another 20% could get another means of livelihood.<sup>[18]</sup> Our study identified the main reasons people refuse amputation to be fear of losing a limb 26.5%, deformity 23.2%, and stigma 14.2%. The current concept of amputation as reconstructive surgery and a first step toward returning the patient to a near normal and productive place in society needs to be patiently explained to patients and their relations.<sup>[22-24]</sup> These will help them to make a quick, well-informed decision. More studies may need to be conducted to find the religious views and cultural belief system of our respondents as regards surgical dismemberment of a body part to facilitate counseling.

The majority of the respondents (78.2%) were aware of artificial limbs (prosthesis) compared to 68% in another study.<sup>[9]</sup> Apart from functionality, the prosthesis also helps to hide the amputation stump and restore an intact looking body image to the individual.<sup>[25]</sup> The more sophisticated prosthesis can even enable amputees to compete and win laurels in sports.

Most of the respondents (54.5%) believed that our society is receptive to amputation, 75.2% were willing to allow their relations to marry an amputee, and 80% believed that amputees are human beings who have potentials in them. In an earlier study, only 21% of the respondents agreed that their society was receptive to amputation, whereas 86% believed that amputees were normal human beings with potentials.<sup>[9]</sup> This differences in opinion may be due to cultural variation.<sup>[10,11]</sup>

## CONCLUSION

This study shows that the respondents have a high level of awareness of the benefits of surgical amputation and a fair knowledge of its indications. They are also willing to encourage others to accept it to save lives. This knowledge is significantly influenced by their religious beliefs, educational status, and gender. There is a need for more education on the prevention of indications for limb ablation as well as the provision of a subsidized, functional prosthesis to provide hope for productivity and good body image after limb loss. Consent for amputation should also involve family and religious leaders when necessary.

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## Conflicts of interest

There are no conflicts of interest.

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