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Knowledge, Attitude, and Perceptions of Uterine Artery Embolization for Uterine Fibroids at Muhimbili National Hospital

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ABSTRACT

Background: Uterine Artery Embolization (UAE) is a minimally invasive and effective treatment for symptomatic uterine fibroids. However, its utilization in low-resource settings such as Tanzania remains limited, potentially due to gaps in knowledge, attitudes, and perceptions among patients and healthcare workers (HCWs). This study aimed to assess and compare knowledge, attitudes, and perceptions regarding UAE among HCWs and women diagnosed with uterine fibroids attending Muhimbili National Hospital (MNH), Tanzania.

Methods: A hospital-based prospective cross-sectional study was conducted between December 2023 and June 2024 among 221 participants, including 94 HCWs and 127 women diagnosed with uterine fibroids, attending the Radiology and Obstetrics/Gynaecology departments at MNH. Data were collected using a structured, pre-tested questionnaire administered through interviews and self-completed questionnaires. Information on socio-demographic characteristics, knowledge of UAE, attitudes toward the procedure, and perceptions of its effectiveness was collected. Data were analyzed using the Statistical Package for the Social Sciences (SPSS) version 26. Descriptive statistics and Pearson's Chi-square tests were employed to assess associations between variables, with statistical significance set at $p<.05$.

Results: The mean age of participants was 33.99 ± 7.99 years. All participants (100%) reported awareness of UAE, primarily through healthcare providers (53%) and the internet (43%). Overall knowledge of UAE was suboptimal, particularly among patients with uterine fibroids. Less than half of the participants identified UAE as a minimally invasive procedure (47.3%), while 52.6% recognized that it is performed by interventional radiologists, and 57.5% correctly identified its mechanism of action. Knowledge of indications for UAE was limited, whereas knowledge of contraindications was relatively higher, with pregnancy (70.9%), contrast media allergy (67.6%), and uncorrectable coagulopathy (66.0%) being correctly identified. Knowledge of complications was low (<50%). HCWs demonstrated significantly higher knowledge across all domains compared to patients with uterine fibroids ($p<.05$). Positive attitudes and perceptions toward UAE were also limited; only 42.1% considered UAE a safe procedure, 38.6% regarded it as an alternative to myomectomy, and 42% recognised its shorter recovery time. Despite this, 66.5% of participants indicated willingness to recommend UAE.

Conclusion: While awareness of UAE was high, detailed knowledge of the procedure, particularly among women with uterine fibroids, remained limited. HCWs demonstrated significantly better knowledge than patients, although important knowledge gaps persisted. Strengthening patient education and enhancing HCWs' training. Improving communication regarding UAE may enhance its acceptance and utilization in Tanzania.

BACKGROUND

Uterine Artery Embolization (UAE) is a minimally invasive procedure used to treat symptomatic uterine fibroids by reducing their blood supply, leading to fibroid shrinkage and alleviation of symptoms.[1] This procedure offers several benefits, including preservation of the uterus, shorter recovery times, and significant reduction in fibroid-related symptoms, making it an attractive alternative to surgical options like hysterectomy.[2,3]

Uterine fibroids are a global health concern, affecting an estimated 20% to 40% of women during their reproductive years.[1] Globally, the lifetime prevalence among women is approximately 70% by age 50.[2-4] In high-income countries, such as the United States, the prevalence has been reported to be around 70-80% among women by the age of 50, with a higher incidence among Black women.[2] In low- and middle-income countries (LMICs), the prevalence of uterine fibroids is less well documented but is believed to be similarly high due to limited access to diagnostic services.[4,5] In sub-Saharan Africa, the prevalence is estimated to be around 60-80%, with studies indicating a particularly high burden among women of African descent.[6,7] In East Africa, a study done in Uganda reported a prevalence of uterine fibroids of 28.2%.[3] In Tanzania, data on the exact prevalence of uterine

fibroids are scarce; however, hospital-based studies suggest a significant burden, with fibroids being a common indication for gynaecological consultations.[8]

The impact of uterine fibroids on women's health and quality of life can be profound. Globally, fibroids are a leading cause of gynaecological morbidity, contributing to anaemia, infertility, and complications during pregnancy.[3, 4,8] In high-income countries, fibroids are among the most common reasons for hysterectomy, accounting for up to 40% of all such surgeries.[9,10] In LMICs, the consequences are often more severe due to delayed diagnosis and limited access to effective treatments.[5] In sub-Saharan Africa, uterine fibroids can lead to significant reproductive health issues, including heavy menstrual bleeding, pelvic pain, and pregnancy complications, which adversely affect women's economic and social well-being.[11] In Tanzania, fibroids contribute substantially to the burden of gynaecological surgery and are a significant public health concern.[8] Uterine artery embolization has increasingly been introduced as a treatment option for the management of symptomatic uterine fibroids and postpartum haemorrhage in Tanzania.[12]

Efforts to address the burden of uterine fibroids in sub-Saharan Africa, including Tanzania, involve a combination of medical, surgical, and minimally invasive treatment approaches. Programs promoting awareness and early diagnosis are crucial for effective management of uterine fibroids.[5] In Kenya, Rwanda, and Uganda, initiatives to improve access to gynaecological care and advanced treatments such as UAE are being implemented.[13,14] In Tanzania, efforts have been focused on enhancing healthcare infrastructure and training healthcare workers in advanced diagnostic and treatment techniques, including UAE. Community-based education and outreach programs are also vital for improving awareness and promoting early intervention for women with uterine fibroids.[12]

Despite these efforts, significant gaps remain in the management of uterine fibroids in Tanzania. There is a lack of comprehensive epidemiological data on the prevalence and burden of uterine fibroids, which hampers evidence-based planning and resource allocation.[15] In addition, there is limited access to advanced treatment procedures like UAE, and a general lack of awareness among healthcare workers and patients about the benefits and availability of such treatment options.[12] Furthermore, the absence of standardized protocols for the management of uterine fibroids and inadequate training of healthcare professionals in minimally invasive techniques continue to present major challenges.[12] Although UAE has emerged as an effective minimally invasive treatment procedure, there is limited evidence regarding healthcare providers' knowledge, attitudes and perceptions of this procedure in Tanzania. Understanding these factors is important for informing strategies to improve awareness, acceptance and utilisation of UAE. Therefore, this study aimed to assess the knowledge, attitudes and perceptions regarding UAE for uterine artery embolization for uterine fibroids at Muhimbili National Hospital.

METHODOLOGY

Study Design and Setting

This was a hospital-based, prospective cross-sectional study employing a quantitative approach. The study was conducted at Muhimbili National Hospital (MNH), located in Upanga, Ilala Municipality, Dar es Salaam, Tanzania. MNH is the country's largest national referral and tertiary healthcare hospital, offering specialized services including interventional radiology. The study was carried out in the Radiology and Obstetrics and Gynaecology departments between December 2023 and June 2024.

Study Population

The study population comprised two groups: Healthcare workers (HCWs) involved in the care and management of patients with uterine fibroids and Women diagnosed with uterine fibroids who attended the Radiology and Obstetrics and Gynaecology clinics at MNH during the study period.

Sampling Technique and Sample Size

Patients: A non-probability convenience sampling technique was used. Eligible women diagnosed with uterine fibroids who attended the selected departments during the study period and provided written informed consent were consecutively recruited until the required sample size was achieved.

The sample size was calculated using Cochran's formula for estimating a single population proportion: $n = Z^2P(1-P)/d^2$

Where Z = 1.96 at a 95% confidence level, *P*=*.14 (proportion of adequate knowledge obtained from the pilot study), and d = 0.064 (margin of error). This yielded an initial sample size of 113 participants. After adjusting for a 10% non-response rate, the final sample size was 127 women.

Healthcare Workers: A census approach was initially employed to include all eligible HCWs in the Radiology and Obstetrics and Gynaecology departments. The total population was 188 HCWs. The required sample size was estimated using Yamane's formula:

$n = N / [1 + N(e^2)]$,

where N=188 and e = 0.05.

This yielded a required sample size of 128 HCWs. However, after applying the eligibility criteria and accounting for non-response, 94 HCWs were successfully recruited and included in the final analysis.

Inclusion and Exclusion Criteria

Patients: Women were eligible if they were at least18 years old, had a confirmed diagnosis of uterine fibroids, attended MNH during the study period, and provided written informed consent.

Women were excluded if they: had cognitive impairment or language barriers that prevented questionnaire completion; had gynaecological malignancies; or had severe comorbidities that could confound their treatment perceptions.

Healthcare Workers: HCWs were eligible if they: worked in the Radiology and Obstetrics and Gynaecology departments; and were directly involved in the management of patients with uterine fibroids.

HCWs were excluded if they were not involved in fibroid management; or were unavailable during the study

period (e.g., on annual leave, study leave, maternity leave or sabbatical).

Data Collection
Data were collected using a structured, pre-tested questionnaire administered through interviewer-guided interviews for patients and self-administered questionnaires for HCWs. The tool captured socio-demographic characteristics, knowledge of the UAE (including the procedure, indications, contraindications, benefits, risks and complications), attitudes toward UAE, and perceptions of its effectiveness. A pilot study was conducted before the main data collection to assess the clarity, relevance, and comprehensibility of the questionnaire, and necessary modifications were made accordingly.

Study Variables
Independent variables included socio-demographic characteristics such as age, education level, occupation, marital status, professional category, and department. Dependent variables included knowledge, attitudes, and perceptions regarding uterine artery embolization.

Operational Definitions
Adequate knowledge of UAE was defined as correctly answering ≥70% of knowledge assessment questions. Participants scoring below this threshold were categorized as having inadequate knowledge.

Data Analysis
Data were entered, cleaned, and analyzed using the Statistical Package for Social Sciences (SPSS) version 26 (IBM Corp., Armonk, NY, USA). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize the data. Chi-square tests were applied to compare knowledge, attitudes, and perceptions between HCWs and patients. A *P*-value of <.05 was considered statistically significant.

Ethical Considerations
Ethical approval was obtained from the Institutional Review Board of Muhimbili University of Health and Allied Sciences (MUHAS) (Reference number DA.282/298/01.C/1969). Permission to conduct the study was also obtained from Muhimbili National Hospital. Written informed consent was obtained from all participants before enrolment. Participation was voluntary, and participants were informed of their right to withdraw from the study at any time without any consequences. Confidentiality and anonymity were maintained throughout the study by using unique identification codes and restricting access to study data to the research team.

RESULTS
Participant Characteristics
A total of 221 participants were included in the analysis, comprising 94 (42.5%) HCWs and 127 (57.5%) women diagnosed with uterine fibroids. The overall mean age of participants was 33.99 years (SD ± 7.99). The majority of participants (71.5%) were aged 35 years or older, with predominance of females (81.9%), and those living with a partner (63.8%). All HCWs (100%) had attained college or university education and were employed (100%). In contrast, the majority of women diagnosed with uterine fibroids had completed secondary education (59.8%), and only 19.7% of women diagnosed with fibroids were employed. Participant characteristics are presented in Table 1.

Knowledge of Uterine Artery Embolization Sources of Information
Overall, more than half of the participants reported HCWs as their primary source of information about UAE (53%), followed by the internet (43%). HCW's were significantly more likely than women diagnosed with uterine fibroids to obtain information from professional sources, including medical symposiums (74.0% vs. 4.3%), conferences (81.6% vs. 6.1%), and hospital meetings (69.7% vs. 4.3%), all with *P*<.05 (Table 2).

Knowledge of Uterine Artery Embolization
Overall, knowledge regarding UAE was generally low. Less than two-thirds of respondents correctly identified UAE as a minimally invasive procedure (47.3%), recognised that it is performed by interventional radiologists (52.6%), knew that tiny particles are used to block blood vessels supplying uterine fibroids (57.5%), or identified moderate sedation as the commonly used anaesthetic approach (57.4%). Knowledge regarding the indications for UAE was also limited. Less than half of the participants correctly identified symptomatic uterine fibroid (48.3%), preservation of the uterus and fertility (48.5%), and management of postpartum haemorrhage (40.9%) as indications for the procedure. In contrast, knowledge regarding contraindications was comparatively higher, with pregnancy (70.9%), allergy to contrast media (67.6%) and uncorrectable coagulopathy (66.0%) being correctly identified by most participants.

Knowledge of potential complications remained limited, with less than half identifying allergy (47.4%) and thrombosis (42.9%) as possible complications of UAE.

Overall, HCWs demonstrated higher levels of knowledge regarding UAE than women diagnosed with uterine fibroids (Table 3).

Attitudes towards Uterine Artery Embolization
Less than half of all participants exhibited positive attitudes towards UAE. It was considered a safe procedure by 88 participants (42.1%). Additionally, 81 participants (38.6%) viewed it as a suitable alternative to myomectomy for treating uterine fibroids, and 85 participants (40.7%) believed it was appropriate for women seeking future pregnancies. HCWs consistently demonstrated a more positive attitude towards UAE than women diagnosed with uterine fibroids across most attitude measures (Table 4).

Perceptions towards Uterine Artery Embolization
Overall, fewer than half of the participants perceived that UAE (uterine artery embolization) was associated with a shorter hospital stay (42%, n=86), or enabling women to return to work and other activities sooner (42%, n=87).

Nearly all participants (176, or 95.7%) expressed a desire to obtain more information about UAE. Furthermore, HCWs generally had a higher confidence level than women diagnosed with uterine fibroids in terms of perceptions.

Regarding the procedure, 66.5% of participants (n = 145) indicated they would recommend UAE to patients, 66.5% (n =145) to friends, 59.8% (n = 125) to relatives, 60.4% (n =125) to themselves or their spouses, and 56.5% (n = 118) to other individuals. Additionally, 45.3% of participants (n = 86) preferred to get more information about UAE, as shown in Table 5.

TABLE 1: Social-demographics Characteristics of Healthcare Workers and Women Diagnosed with Fibroid Attending MNH (N=221)

Variable	Healthcare Workers (N=94) n(%)	Women with Fibroid (N=127) n(%)	Total (N=221) n(%)
Age (mean ± SD)	33.5 ± 8.1 years	34.7 ± 8.0 years	33.99 ± 7.99
Age Group			
<35	19 (20.2)	44 (34.6)	63 (28.5)
35+	75 (79.8)	83 (65.4)	158 (71.5)
Gender			
Male	40 (42.6)	0 (0.0)	40 (18.1)
Female	54 (57.4)	127 (100.0)	180 (81.9)
Marital Status			
Living with partner	61 (64.9)	80 (63.0)	141 (63.8)
Living without partner	33 (35.1)	47 (37.0)	80 (36.2)
Education Level			
Primary/below	0 (0.0)	30 (23.6)	30 (13.6)
Secondary	0 (0.0)	76 (59.8)	76 (34.4)
College/University	94 (100.0)	21 (16.5)	115 (52.0)
Occupational Status			
Employed	94 (100.0)	25 (19.69)	119 (53.8)
Unemployed	0 (0.0)	102 (80.31)	102 (46.2)

TABLE 2: Source of Information about Uterine Artery Embolization (UAE) among Health Workers and Women with Fibroid Attending MNH (N=221)

Source	Health Worker n(%)	Women with Fibroid n(%)	Overall n(%)	*p-value*
Healthcare providers	76 (89.4)	36 (29.3)	112 (53.8)	.000
Family member	11 (15.3)	24 (15.3)	35 (18.0)	.442
Internet or YouTube	59 (75.6)	27 (22.1)	86 (43.0)	.000
Media outlet	16 (22.9)	10 (8.5)	26 (13.9)	.006
Television	13 (18.1)	9 (7.8)	22 (11.7)	.033
Radio	12 (16.9)	8 (6.9)	20 (10.7)	.032
Newspaper	12 (16.7)	7 (6.1)	19 (10.2)	.020
Hospital meetings	53 (69.7)	5 (4.3)	58 (30.4)	.000
Clinical consultation	49 (65.3)	7 (6.1)	56 (29.6)	.000
Medical symposium	57 (74.0)	5 (4.3)	62 (32.0)	.000
Conferences	62 (81.6)	7 (6.1)	69 (36.1)	.000
Hospital advert	36 (50.7)	9 (8.0)	45 (24.5)	.000
Medical training	61 (82.4)	7 (6.0)	68 (35.8)	.000

TABLE 3: Knowledge of Uterine Artery Embolization among Health Workers and Women with Fibroid Attending MNH (N=221)

About UAE	Health Worker n(%)	Women with Fibroid n(%)	*p-value*
Minimally invasive procedure	72 (88.9)	24 (19.7)	.000
UAE is a gynaecologic procedure	33 (40.2)	18 (15.0)	.000
Performed by interventional radiologist	81 (93.1)	29 (23.8)	.000
Accessing arteries and using equipment	72 (91.1)	13 (10.9)	.000
Tiny particles injected into blood vessels	61 (79.2)	7 (5.8)	.000
Particles cut off blood flow to fibroids	75 (92.6)	13 (10.7)	.000
Uses moderate sedation	60 (81.1)	12 (10.1)	.000
Indication			
Symptomatic uterine fibroid	78 (90.7)	23 (18.7)	.000
Postpartum haemorrhage	62 (72.1)	15 (12.5)	.000
Adenomyosis	39 (47.0)	9 (7.6)	.000
A need to keep the uterus	78 (92.9)	21 (17.5)	.000
A need to preserve fertility	68 (85.0)	13 (11.0)	.000
Very young female	55 (68.8)	13 (10.9)	.000
Old aged female	21 (26.3)	14 (11.7)	.008
Profuse menstruation	52 (64.2)	16 (13.2)	.000
Prolonged menstruation	54 (66.7)	14 (11.6)	.000
Dysmenorrhoea	46 (57.5)	10 (8.3)	.000
Dyspareunia	28 (35.4)	10 (8.3)	.000
Frequent urination	23 (29.9)	8 (6.8)	.000
Urinary retention	33 (42.9)	7 (6.0)	.000
Constipation	31 (41.3)	5 (4.5)	.000
Contraindication			
Genital tract infection	29 (41.4)	11 (31.4)	.032
Pregnancy	62 (82.7)	16 (45.7)	.000
Uterine or cervical carcinoma	43 (60.6)	8 (22.2)	.000
Doubts about diagnosis	51 (69.9)	9 (25.7)	<.001
Allergy to contrast media	55 (76.4)	18 (50.0)	.006
Uncorrected coagulopathy	60 (84.5)	10 (28.6)	.000
No knowledge on contraindication	29 (34.1)	110 (86.6)	.000
Complication			
Allergy	70 (83.3)	22 (20.0)	.000
Swelling at site of catheterization	67 (84.8)	12 (11.0)	.000
Abdominal pain	58 (74.4)	9 (8.3)	.000
Pelvic pain	58 (73.4)	9 (8.3)	.000
Fever	50 (62.5)	11 (10.1)	.000
Nausea	47 (60.3)	3 (2.8)	.000
Vomiting	48 (62.3)	4 (3.7)	.000
Hypertension	35 (44.3)	6 (5.6)	.000
Infection	58 (72.5)	6 (5.5)	.000
Thrombosis	72 (83.7)	12 (10.9)	.000
Change in color of patient leg	48 (60.0)	6 (5.5)	.000
I don't know any complication	23 (29.5)	91 (74.6)	.000

TABLE 4: Attitudes Towards Uterine Artery Embolization Among Health Workers and Women with Fibroid Attending MNH (N=221)

Attitude Statement	Health Worker n(%)	Women with Fibroid n(%)	*p-value*
UAE is safe procedure	57 (69.5)	31 (24.4)	.000
UAE is a novel alternative treatment option to myomectomy for fibroids	69 (83.1)	12 (9.4)	.000
UAE proffered in patients seeking future pregnancies	67 (81.7)	18 (14.2)	.000
Most of patients gets relief of reduce pain, pressure, and bleeding symptoms after UAE	64 (80.0)	2 (1.6)	.000
UAE may reduce pain from fibroids earlier	64 (80.0)	5 (4.0)	.000
UAE may reduce bleeding from fibroids earlier	67 (83.8)	12 (9.4)	.000
UAE may slowly reduce pressure from fibroids	64 (81.0)	11 (8.7)	.000
Increased risk of pregnancy (obstetric) complications after UAE	26 (33.8)	1 (0.8)	.000
Increased rate of miscarriage after UAE	13 (16.5)	1 (0.8)	.000
Increased rates of preterm delivery after UAE	11 (13.9)	8 (6.5)	.075
There is increased risk of intrauterine growth restriction after UAE	15 (19.0)	5 (4.0)	.000
Increased risk of malpresentation after UAE	12 (15.0)	5 (4.1)	.006
Increased risk of abnormal placentation after UAE	12 (15.2)	3 (2.4)	.001
Increased risk of postpartum haemorrhage after UAE	10 (12.7)	4 (3.2)	.010
Increased risk of caesarean section after UAE	7 (8.9)	6 (4.8)	.247
UAE does not diminish uterine fibroids totally	16 (20.5)	6 (4.8)	.000
UAE does not diminish pregnancy complications associated with fibroids	20 (26.0)	5 (4.0)	.000
High pregnancy rates after UAE	21 (26.9)	5 (4.1)	.000
UAE does not limit reproductive plans compared to myomectomy	31 (40.3)	12 (9.6)	.000
Menopause after UAE occurs in patients older than 45 years	13 (16.7)	5 (4.0)	.002
I don't have any attitudes	49 (62.8)	42 (33.3)	.000

TABLE 5: Perceptions Towards Uterine Artery Embolization Among Health Workers and Women with Fibroid Attending MNH (N=221)

Perception	Health Worker n(%)	Women with Fibroid n(%)	*p-value*
UAE can treat many fibroids at the same time	58 (73.4)	11 (8.8)	.000
UAE is less painful than a hysterectomy	61 (77.2)	21 (16.5)	.000
UAE involves a shorter hospital stay	66 (82.5)	20 (16.0)	.000
UAE allows women to go back to work and other activities sooner	67 (83.8)	20 (15.7)	.000
UAE has lower rates of blood transfusion	59 (73.8)	9 (7.2)	.000
A few patients may need another procedure or surgery after UAE	50 (62.5)	6 (4.8)	.000
UAE has a risk of bleeding at access site	54 (71.1)	9 (7.3)	.000
UAE has a risk of infection	51 (64.6)	7 (5.6)	.000
UAE has a risk of injury to an artery of the uterus	55 (69.6)	9 (7.3)	.000
UAE has a risk of delayed diagnosis of a rare cancer mistaken for fibroids	37 (48.1)	3 (2.4)	.000
UAE has a risk of passing fibroid tissue through vagina	29 (38.2)	3 (2.5)	.000

Continue

TABLE 5: Continued

Perception	Health Worker n(%)	Women with Fibroid n(%)	*p-value*
UAE has a risk of uterine abscess	42 (54.5)	4 (3.3)	.000
UAE has a risk of problems with a future pregnancy	27 (34.6)	7 (5.8)	.000
UAE has a risk of problems with ovaries in 45 years or older patients	25 (32.5)	4 (3.3)	.000
UAE may negatively influence ovarian function	25 (32.1)	4 (3.3)	.000
Pregnancy rates after UAE are comparable to general population	31 (40.8)	7 (5.7)	.000
Lower rate of reproductive or fertility outcome after UAE compared to myomectomy	25 (33.3)	3 (2.5)	.000
Risk of fibroid recurrence after UAE	28 (36.8)	4 (3.3)	.000
Risk of re-intervention after UAE	30 (39.5)	5 (4.1)	.000
Requirement of further surgical intervention after UAE	24 (32.0)	1 (0.8)	.000
Impact of the UAE on fertility is controversial	16 (20.5)	8 (6.5)	.003
Impact of UAE on conception is controversial	11 (14.3)	6 (4.9)	.020
Recommendation			
Patient	81 (89.0)	64 (50.4)	.000
Friend	63 (75.0)	63 (50.0)	.000
Relative	62 (74.7)	63 (50.0)	.000
Yourself/ Your wife	51 (63.0)	74 (58.7)	.543
Someone else	57 (68.7)	61 (48.4)	.004
I prefer/ would prefer UAE over other treatment options for uterine fibroids	37 (56.1)	49 (39.5)	.029
We need more knowledge about UAE	57 (93.4)	119 (96.7)	.301

* One participant may respond to more than one variable

DISCUSSION

This study demonstrated a high level of awareness of UAE, with all respondents (100%) reporting prior knowledge of the procedure. This finding contrasts with that reported by Alreshidi et al., where awareness was considerably lower.[16] The discrepancy may be attributable to differences in sampling strategies, study populations, and healthcare settings. Because this study was conducted at a national tertiary referral hospital with established interventional radiology (IR) services, participants likely had greater exposure to UAE, which contributed to the high level of awareness observed.

Despite the high awareness, detailed knowledge of UAE remained suboptimal among participants. While over one-third correctly identified UAE as involving injection of particles into blood vessels, understanding of technical aspects such as vascular access, catheter use, and embolic mechanisms was inconsistent. This pattern fosters a general awareness of UAE but limited procedural understanding. This gap occurs because information dissemination often focuses on service availability and benefits rather than technical details/ processes. In contrast, knowledge regarding contraindications, including pregnancy, allergy to contrast media, and uncorrectable coagulopathy, was relatively high. Similar findings have been reported in Saudi Arabia.[17] The observed similarities may be explained by the fact that both studies took place in tertiary hospitals with interventional radiology services. Furthermore, contraindications are routinely emphasized during clinical assessment and patient safety screening, which may account for the higher level of knowledge in this domain.

The study also revealed differences in the sources of information regarding UAE compared to prior studies. In this study, HCWs served as the primary source of information, followed by the internet. Conversely, research from Saudi Arabia and other regions reported the internet and social media as the dominant information sources.[16] This variation likely reflects contextual factors such as digital access, health literacy, and healthcare system structure. In limited-resource settings like Tanzania, direct interaction with HCWs may play a more significant role in health education than online platforms.

A notable finding is the disparity between HCWs and patients diagnosed with uterine fibroids in terms of knowledge, attitude, and perception. HCWs consistently demonstrated better understanding and more favourable attitudes toward UAE, including its safety, efficacy, and role as an alternative to myomectomy. Conversely, patients showed lower awareness of indications and benefits, alongside more negative perceptions. This discordance may be due to differences in medical training, exposure to evidence-based guidelines, and access to professional education. It also suggests gaps in patient counselling and communication, where information about UAE may not be adequately conveyed in understandable terms.

Compared with previous research, findings reveal that knowledge and attitudes toward the UAE (uterine artery embolization) differ significantly across settings. Similar studies conducted in low- and middle-income countries have reported limited patient knowledge and a strong reliance on physician recommendations when making treatment decisions.[12] The relatively higher awareness observed among HCWs in this study aligns with findings from tertiary centers where IR services are available, suggesting that institutional capacity and access to specialised services may influence knowledge and perceptions of UAE.

Study Strength and Limitations

The findings of this study have important clinical and policy implications. Strengthening referral pathways to interventional radiology services may improve access to UAE among eligible patients with symptomatic uterine fibroids. In addition, patient-centered educational materials, particularly in local languages such as Swahili, could improve understanding and acceptance of the procedure. Continuing professional development for HCWs should also be strengthened to ensure up-to-date knowledge regarding the indications, benefits, contraindications, and patient selection criteria for UAE.

This study has several limitations. First, it was conducted at a single tertiary referral hospital, which may limit the generalizability of the findings to other healthcare settings in Tanzania. Second, the use of a questionnaire that had not undergone formal psychometric validation may have affected the reliability and validity of the findings. Additionally, responses may be subject to social desirability bias, particularly among HCWs who may have over-reported knowledge or positive attitudes. Finally, the cross-sectional design also limits the ability to assess causality or changes over time.

Future research should include multicenter studies involving diverse healthcare settings to improve the generalizability of the findings. The development and validation of standardized instruments for assessing Knowledge, Attitude and Practice (KAP) regarding UAE would strengthen future research. Interventional studies evaluating the effectiveness of educational programs in improving patient knowledge and informed decision-making are also warranted. Furthermore, qualitative research exploring patients' experiences, perceptions and barriers to UAE uptake would provide deeper insights into the observed knowledge gaps and negative attitudes.

In conclusion, while awareness of UAE is high in this setting, significant gaps remain in detailed knowledge and patient understanding. Addressing these gaps through targeted education, improved communication, and strengthened healthcare systems may enhance the uptake and effectiveness of UAE as a treatment option for uterine fibroids.

CONCLUSION

Overall, knowledge of the contraindications to UAE was relatively good; however, knowledge regarding the procedure, its indications, and potential complications was low, leading to poor attitude and perceptions toward UAE. HCWs demonstrated significantly higher levels of knowledge than women with uterine fibroids across all assessed domains. These findings highlight the need for targeted educational initiatives for both HCWs and patients to improve understanding and acceptance of UAE. Strengthening patient-provider communication, increasing public awareness through appropriate media platforms, and improving access to UAE services may enhance the utilisation of this minimally invasive treatment option. Furthermore, healthcare institutions, the Ministry of Health, and other stakeholders should promote the integration of UAE into clinical practice guidelines and expand insurance coverage to improve its accessibility and affordability. Increased education and training for healthcare providers on the benefits and appropriate use of uterine artery embolization (UAE) can improve patient awareness, standardize clinical practices, and increase adoption of this minimally invasive treatment for conditions like uterine fibroids. Future research should evaluate the effectiveness of educational interventions in improving knowledge, attitudes, perceptions, and informed decision-making regarding UAE.

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