Knowledge, Attitudes, and Practices regarding Non-Scalpel Vasectomy among Male Outpatients at a Tertiary Healthcare Facility in Eastern India

Richa R,[1] Biswas B,[1] Jahnavi G,[1] Boratne AV,[1] Venugopal V,[1] Gautam A,[1] Gupta P,[2] Varshney S[3]

[1]Department of Community and Family Medicine,

[2]Department of Microbiology,

[3]Executive Director and Chief Executive Officer,

All India Institute of Medical Sciences,

Deoghar, Jharkhand, India.

Corresponding Author

Bijit Biswas

Department of Community and Family Medicine,

All India Institute of Medical Sciences,

Deoghar, Jharkhand, India.

E-mail: drbijitbiswas@gmail.com

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ABSTRACT

Background

Despite being a safe and effective permanent contraceptive method, acceptance of Non-Scalpel Vasectomy remains low in India due to poor awareness and misconceptions.

Objective

To assess knowledge, attitudes, and practices regarding Non-Scalpel Vasectomy among male outpatients at a tertiary healthcare facility in Eastern India.

Method

A cross-sectional study was conducted at a tertiary healthcare facility in Deoghar, Jharkhand, involving 346 married male outpatients with partners aged 15-44 years. Participants were selected through systematic random sampling, and data were collected using a pretested questionnaire on sociodemographic characteristics, knowledge, attitudes, and practices.

Result

Of the participants, 61.0% demonstrated substantial knowledge of Non-Scalpel Vasectomy and 52.0% had a favourable attitude, yet only 1.7% had undergone the procedure. Major barriers to acceptance included lack of awareness (34.4%), fear of side effects (17.3%), and social stigma (9.0%). Greater knowledge was significantly associated with higher educational attainment [Adjusted Odds Ratio: 1.19, 95% Confidence Interval: 1.08-1.31] and a favourable attitude [Adjusted Odds Ratio: 2.95, 95% Confidence Interval: 1.77-4.91]. A favourable attitude was similarly linked to higher knowledge [Adjusted Odds Ratio: 2.96, 95% Confidence Interval: 1.78-4.91] but inversely related to increasing partner age [Adjusted Odds Ratio: 0.91, 95% Confidence Interval: 0.84-0.99]. Willingness to undergo the procedure was higher among those with greater knowledge (71.1%, p=0.001) and favourable attitudes (59.9%, p=0.007).

Conclusion

Awareness of Non-Scalpel Vasectomy was moderate, but notable gaps in knowledge and attitudes persisted, highlighting the need for targeted education, counselling, and community engagement to enhance acceptance and uptake.

KEY WORDS

Health knowledge, Male, Outpatients, Reproductive, Sterilization, Vasectomy

INTRODUCTION

Male sterilization (vasectomy) is one of two modern male contraceptive methods, with barrier methods being the other, and the only permanent option.[1,2] Vasectomy is safer, easier, and quicker (10-20 minutes) to perform than tubectomy, though it takes about three months to become fully effective, requiring additional contraception during this time.[3,4] Despite a global increase of 188 million contraceptive users in the past 20 years, vasectomy use has decreased by 61%, especially in low- and middle-income countries (LMICs), where the vasectomy-to-tubectomy ratio widened from 1:5 in 2001 to 1:13 in 2019. In India, this ratio is 1:76.[2-4]

India saw male sterilization peak at 80.5% of total sterilizations between 1966 and 1970, but rates have since dropped. The introduction of non-scalpel vasectomy (NSV) in 1992, a less invasive technique, was ideal for rural hospitals, but acceptance has remained low, decreasing from 3.5% in 1993 to 0.3% in 2021.[3-6] Financial incentives and insurance coverage exist for male sterilization, along with healthcare provider incentives for promoting and performing the procedure.[7,8] However, barriers like fears of complications, perceived loss of masculinity, wage loss, stigma, and religious beliefs continue to limit uptake.[5,7-18]

Jharkhand, with a population of 40 million, has a higher acceptance of modern contraceptive methods than the national average, though NSV rates have fluctuated, rising from 0.2% in 2016 to 0.4% in 2021.[19-22] This study aimed to assess NSV knowledge, attitudes, and practices among male outpatients at a tertiary healthcare facility in Eastern India, providing insights into baseline knowledge and potentially increasing awareness.

METHODS

This cross-sectional study was conducted in the outpatient department of the All India Institute of Medical Sciences (AIIMS), Deoghar, Jharkhand, located in Eastern India, during May-June, 2024. AIIMS Deoghar is an emerging institute of national importance, serving patients not only from Jharkhand but also from neighbouring states like Bihar and West Bengal. The inclusion criteria encompassed all married male attendees of the outpatient department whose partners were aged between 15-44 years. Males who did not provide written informed consent were excluded from the study. Assuming that at least 32.8%~33.0% of the study population had satisfactory knowledge regarding NSV, as reported by Shafi et al.[23]

in Lucknow, a minimum of 340 participants were required. The sample size was calculated using the formula $n= z^2p(1-p)/d^2$, where Z is the standard normal deviate at 95% confidence (1.96), p is the expected proportion (0.328), and d is the absolute precision (0.05). This yielded a sample size of 340, which was further validated using Statulator, an online sample size calculator.

Based on records from the previous year, approximately 800 patients and their attendants visited the outpatient department of AIIMS, Deoghar, on an average day. Assuming an equal gender mix among the study population over five data collection days, the total number of study subjects that could be included was 2000. To ensure a representative sample, every fifth patient (systematic random sampling) arriving at the outpatient department was approached for the study. If the selected patient was a female or a minor, their male attendant or parent (if present) was approached. Otherwise, the subsequent patient or their attendant was approached while keeping the remaining sampling sequence unchanged. Only male patients or attendants who were married and had a living partner aged between 15-44 years were considered. Each data collection day, the first random number between 1 and 5 was chosen using the OpenEpi random number generator.[24] Those who provided informed written consent were included, excluding others. Using this method, a total of 346 patients were enrolled for the study during the study period. After data collection, the study participants were thanked and provided with a brief educational intervention on NSV. This intervention covered the procedure and addressed common myths associated with it.

The study questionnaire included sociodemographic information (age, completed years of schooling, partner's age, duration of marriage, religion, caste, occupation, family size, income, etc.) and knowledge, attitude, practices related to NSV (whether undergone, if not, willingness to undergo) and current contraceptive (whether using any modern method, if yes what). The questionnaire was developed based on a review of the literature and in consultation with subject experts to ensure face, construct, and criterion validity.[7,10,14,16,23,25] The draft tool was pretested among thirty indoor patients of our institute who were not included in the final sample. The final knowledge and attitude tools consisted of five and three items, respectively. The Cronbach's alpha for the knowledge and attitude tools during pretesting was 0.75 and 0.84, respectively. In the final assessment, the Cronbach's alpha was 0.74 for knowledge (indicating acceptable reliability) and 0.85 for attitude (indicating good reliability). Participants received one point for each correct response to knowledge and attitude items and zero for incorrect responses. The scores for all knowledge and attitude items were summed to obtain total knowledge and attitude scores, respectively. Participants who scored two or more (the median) on knowledge were considered to have more knowledge regarding NSV, while those who scored less had less knowledge. Similarly, participants who scored three (the median) on attitude were considered to have a favourable attitude toward NSV, while others had an unfavourable attitude.

Data were collected using Google Forms and exported into Excel before being imported into JAMOVI (version 2.3.26) for analysis. Quantitative variables were summarized as medians with interquartile ranges (IQR) rather than means with standard deviations (SD), as the data were not normally distributed (Shapiro–Wilk test), while qualitative variables were presented as frequencies and percentages with 95% confidence intervals (CIs). Univariate logistic regression was first performed to identify factors associated with higher knowledge and favourable attitudes. Multivariable logistic regression was then conducted using the forced entry method, in which all selected independent variables were entered into the model simultaneously, irrespective of their statistical significance in univariate analysis, to adjust for potential confounding and assess the independent effect of each factor. Associations were expressed as odds ratios (ORs) with corresponding 95% CIs. A two-tailed p-value < 0.05 was considered statistically significant.

RESULTS

Most of the study participants were aged between 30-37 years (30.3%), with a median age of 38 years (IQR: 30-44 years). Approximately one-fourth (28.9%) of the participants' partners were aged 38 years or older, with a median age of 32 years (IQR: 27-38 years). The majority of the participants had been married for 12 years or more (51.2%), with a median duration of marriage of 12 years (IQR: 5-18 years). About two-fifths (42.5%) of the participants had completed at least a graduate level of education, with a median of 12 years of schooling (IQR: 10-15 years). Regarding occupation, most participants were engaged in unskilled work (30.3%), while 9.2% were semi-professionals and 1.7% were professionals. The majority of participants were Hindu (89.9%) and belonged to the general caste (48.3%). The median number of family members was 6 (IQR: 5-7), and the median number of children was 2 (IQR: 2-3). The median per capita monthly income was 35.9 USD (IQR: 22.4-74.9 USD) (Table 1).

Table 1. Distribution of the Study Participants as per their Socio-Demographic Characteristics: (n=346)

Variable	N	% (95% CI)
Age of the study participants in years		
< 30	67	19.4 (15.5-23.8)
30-37	105	30.3 (25.7-35.4)
38-44	92	26.6 (22.2-31.5)
≥ 45	82	23.7 (19.5-28.4)
Age of the partner in years		
< 27	85	24.6 (20.3-29.4)
27-32	88	25.4 (21.1-30.3)
33-37	73	21.1 (17.1-25.7)
≥ 38	100	28.9 (24.4-33.9)
Duration since marriage in years		
< 5	59	17.1 (13.5-21.4)
5-11	110	31.8 (27.1-36.9)
12-18	94	27.2 (22.7-32.1)
> 18	83	24.0 (19.8-28.8)
Educational level of the study participants (completed years of schooling)		
Up to Secondary (0-9)	61	17.6 (13.9-21.9)
Secondary (10-11)	72	20.8 (16.9-25.4)
Higher Secondary (12-14)	66	19.1 (15.3-23.5)
Graduate and above (≥ 15)	147	42.5 (37.4-47.7)
Occupation		
Unskilled*	105	30.3 (25.7-35.4)
Semi-Skilled†	99	28.6 (24.1-33.6)
Skilled‡	32	9.2 (6.6-12.8)
Arithmetic Skill Job‖	72	20.8 (16.9-25.4)
Semi Professional¶	32	9.2 (6.6-12.8)
Professional**	6	1.7 (0.8-3.7)
Religion		
Hindu	311	89.9 (86.3-92.6)
Muslim	31	9.0 (6.4-12.4)
Christian	4	1.2 (0.5-2.9)
Caste		
ST	15	4.3 (2.6-7.0)
SC	33	9.5 (6.9-13.1)
OBC	131	37.9 (32.9-43.1)
General	167	48.3 (43.1-53.5)
Number of Family Members		
< 5	76	22.0 (17.9-26.6)
5-6	162	46.8 (41.6-52.1)
7-8	53	15.3 (11.9-19.5)
> 8	55	15.9 (12.4-20.1)
Number of Children		
< 2	82	23.7 (19.5-28.4)
2	131	37.9 (32.9-43.1)
3	91	26.3 (21.9-31.2)
≥ 4	42	12.1 (9.1-16.0)
PCMI: (in USD)		
< 22.4	81	23.4 (19.3-28.1)
22.4-35.9	83	24.0 (19.8-28.8)
36.0-74.8	94	27.2 (22.7-32.1)
≥ 74.9	88	25.4 (21.1-30.3)

CI: Confidence Interval; ST: Scheduled Tribe; SC: Scheduled Caste; OBC: Other Backward Caste; PCMI: Per Capita Monthly Income; USD: United States Dollar. *Unskilled: Farmer (90), Guard (11), Daily Wage Labourer (3), Peon (1); †Semi Skilled: Shopkeeper (76), Factory Labourer (18), Health Worker (3), Office Attendant (1), Cook (1); ‡Skilled: Driver (13), Electrician (8), Lab Technician (4), Carpenter (2), Plumber (2), Mechanic (1), Tailor (1), Priest (1); ‖Arithmetic Skill Job: Clerk (45), Elementary School Teacher (21), Salesman (4), Property Dealer (1), Farm Owner (1); ¶Semi-Professional: High School Teacher (30), Junior Administrator (1), Accountant (1); **Professional: Engineer (5), Bank Manger (1).

The responses to various knowledge and attitude items regarding NSV are presented in table 2. The median knowledge score was 2 (IQR: 1-3), and the median attitude score was 3 (IQR: 1-3). More knowledge was present in 61.0% (95% CI: 55.7-65.9%) of the study participants, while a favourable attitude was present in 52.0% (95% CI: 46.8-57.2%). The predominant sources of knowledge about NSV were primary healthcare workers (28.9%), followed by friends (26.9%), mass media (e.g., television, radio), and social media (e.g., Facebook, WhatsApp), with 5.8% relying on print media (e.g., newspapers, hoardings). Although 74.6% of the study population had heard about NSV, only 1.7% (95% CI: 0.8-3.7%) had actually undergone the procedure. According to the study participants, the predominant reasons for the low acceptance of NSV as a permanent method of family planning were lack of awareness (34.4%), fear of side effects (17.3%), particularly weakness, social stigma (9.0%), and concerns about reduced masculinity (8.7%). Additionally, 7.5% of participants believed that contraception is the female's responsibility. Other modern contraceptive methods used by the study participants included tubal ligation (36.4%), condoms (17.6%), oral contraceptive pills (4.3%), and intrauterine contraceptive devices (IUCD) (0.3%), while 39.6% were not using any modern methods. When we asked those who had not undergone NSV (N=340) whether one should prefer NSV as a method of permanent contraception after family completion, 41.8% (95% CI: 36.6-47.1%) responded affirmatively. Willingness to undergo NSV was significantly associated with higher knowledge levels (yes: 71.1%, no: 52.5%, p=0.001) and a favourable attitude (yes: 59.9%, no: 44.9%, p=0.007) (Fig. 1 and 2).

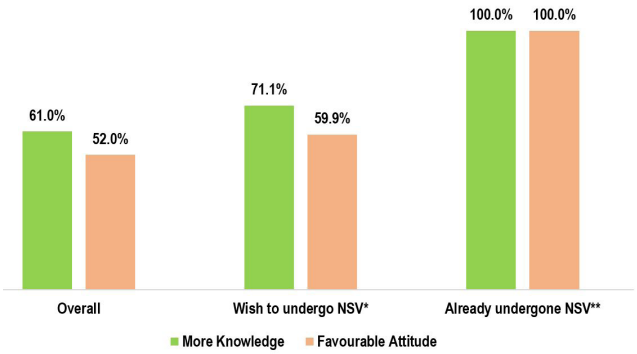
In univariate logistic regression analysis, greater knowledge about NSV was associated with higher educational levels (more completed years of schooling), occupation (semi-skilled and other categories), religion (Hindu), and a per capita monthly income (PCMI) of ≥ 35.9 USD. A favourable attitude towards NSV was also linked to longer duration of marriage and a greater number of children, both of which were protective factors. In the multivariable logistic regression analysis, educational level (more completed years of schooling) [Adjusted Odds Ratio (AOR), 95% Confidence Interval (CI): 1.19 (1.08-1.31)] and a favourable attitude [AOR: 2.95 (1.77-4.91)] remained significantly associated with greater knowledge about NSV after adjusting for other variables. Overall, the model explained 32.0% of the variability in the outcome variable and had a predictive accuracy rate (PAR) of 73.4%. The non-significant Hosmer-Lemeshow test (p=0.571) indicated a good model fit (Table 3).

Similarly, in univariate logistic regression analysis, a favourable attitude towards NSV was associated with higher educational levels, occupation (semi-skilled and other categories), religion (Hindu), a per capita monthly income of ≥ 35.9 USD, and greater knowledge about NSV. In multivariable logistic regression analysis, greater knowledge about NSV [AOR: 2.96 (1.78-4.91)] continued to be significantly associated with a favourable attitude towards NSV after adjusting for other variables, while increasing age of the partner [AOR: 0.91 (0.84-0.99)] was found to be protective. Overall, the model explained 18.5% of the variability in the outcome variable and had

Table 2. Distribution of the Study Participants as per Their Knowledge and Attitude regarding NSV: (n=346)

Item	N	% (95% CI)
Knowledge Items		
Have you heard about NSV as a method of male contraception?		
Yes	258	74.6 (69.7-78.9)
No	88	25.4 (21.1-30.3)
Is hospitalisation required to perform NSV?		
Yes	81	23.4 (19.3-28.1)
No	265	76.6 (71.8-80.7)
Do one need to spend money for the procedure?		
Yes	42	12.1 (9.1-16.0)
No	304	87.8 (84.0-90.9)
Are aware regarding government incentive for NSV?		
Yes	178	51.4 (46.2-56.7)
No	168	48.6 (43.3-53.8)
Are you aware of the government-provided insurance for NSV-related complications or failures (i.e. pregnancy)?		
Yes	62	17.9 (14.2-22.3)
No	284	82.1 (77.7-85.8)
Attitude Items		
NSV is better than female sterilization:		
Agree	213	61.6 (56.3-66.5)
Disagree	133	38.4 (33.5-43.7)
Contraception is the responsibility of female partner:		
Agree	97	28.0 (23.6-32.9)
Disagree	249	72.0 (67.0-76.4)
One must prefer NSV over Tubectomy as a method of permanent contraception:		
Agree	209	60.4 (55.2-65.4)
Disagree	137	39.6 (34.6-44.8)

NSV: Non Scalpel Vasectomy, CI: Confidence Interval. Correct responses are being highlighted.



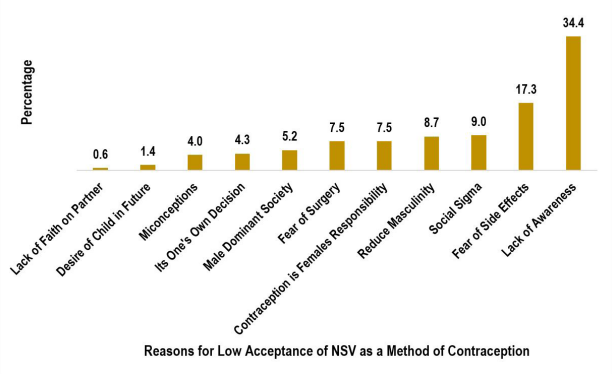
NSV: Non Scalpel Vasectomy; *N=142; **N=6

Figure 1. Bar Chart Showing Distribution of Study Participants by Knowledge, Attitude, and Status of NSV (n=346)

Table 3. Univariate and Multivariable Logistic Regression Analysis Showing Predictors of More Knowledge regarding NSV among the Study Participants (n=346)

Variable	N (%) / Median [IQR]	More Knowledge N (%)	COR (95% CI)	AOR (95% CI)
Age of the study participants in years:	38 [30,44]	-	0.98 (0.96-1.01)	1.07 (0.98-1.16)
Age of the partner in years:	32 [27,38]	-	0.98 (0.95-1.01)	0.98 (0.89-1.08)
Duration since marriage in years:	12 [5,18]	-	**0.96 (0.94-0.99)**	0.96 (0.89-1.04)
Educational level of the study participants in completed years of schooling:	12 [10,15]	-	**1.30 (1.20-1.40)**	1.19 (1.08-1.31)
Occupation of the participant:				
Unskilled	105 (30.3)	42 (40.0)	Ref.	Ref.
Semi-Skilled	99 (28.6)	65 (65.7)	**2.87 (1.62-5.07)**	1.40 (0.72-2.72)
Others	142 (41.0)	104 (73.2)	**4.11 (2.39-7.04)**	1.67 (0.86-3.24)
Religion:				
Hindu	311 (89.9)	198 (63.7)	**2.96 (1.44-6.11)**	1.67 (0.66-4.24)
Others	35 (10.1)	13 (37.1)	Ref.	
Caste:				
SC/ST	48 (13.9)	25 (52.1)	0.66 (0.36-1.21)	0.88 (0.42-1.83)
Others	298 (86.1)	186 (62.4)	Ref.	Ref.
Number of Family Members:	6 [5,7]	-	0.96 (0.89-1.03)	1.04 (0.94-1.15)
Number of Children:	2 [2,3]	-	**0.70 (0.59-0.84)**	0.92 (0.70-1.21)
PCMI: (in USD)				
< 35.9	164 (47.4)	75 (45.7)	Ref.	Ref.
≥ 35.9	182 (52.6)	136 (74.7)	**3.51 (2.23-5.52)**	1.51 (0.82-2.89)
Attitude towards NSV:				
Favourable	180 (52.0)	137 (76.1)	**3.96 (2.50-6.27)**	**2.95 (1.77-4.91)**
Unfavourable	166 (48.0)	74 (44.6)	Ref.	Ref.

NSV: Non Scalpel Vasectomy; SC: Scheduled Caste; ST: Scheduled Tribe; PCMI: Per Capita Monthly Income; USD: United States Dollar; COR: Crude Odds Ratio; CI: Confidence Interval; AOR: Adjusted Odds Ratio. Significant CORs and AORs are being highlighted.



NSV: Non Scalpel Vasectomy

Figure 2. Bar Chart Showing Predominant Reasons for Low Acceptance of NSV as a Method of Contraception as per the Study Participants: (n=346)

a predictive accuracy rate of 66.8%. The non-significant Hosmer-Lemeshow test (p=0.275) indicated a good model fit (Table 4).

DISCUSSIONS

The study aimed to assess the knowledge, attitudes, and practices regarding NSV among male outpatients at a tertiary healthcare facility in Eastern India. We found that about three out of five surveyed had adequate knowledge about NSV, while only half had a favourable attitude, and only six individuals had undergone the procedure. Approximately two-fifths believed NSV should be preferred as a method of permanent contraception, and those with this opinion had more knowledge and a more favourable attitude towards NSV. Greater knowledge was predicted by higher educational levels and a favourable attitude, while a favourable attitude was predicted by having a younger spouse and more knowledge.

We found that 74.6% of participants had heard about NSV as a method of male contraception, similar to the 77.5% reported by Sangam et al.,[12] in Mumbai but less than the 83.6% in the study by Shafi et al. in Lucknow.[10] This awareness was higher than the 57.8% reported by Kishore et al. in rural West Bengal and the 30.0% by Shrivastava et al. in rural South India.[7,25] In Ethiopia, Dejene Wolde et al. reported 63.2% awareness about vasectomy.[13] In our study, 76.6% knew that hospitalization is not required for NSV, which was higher than the findings of Kishore et al. (54.8%), Shafi et al. (32.0%), and Shrivastava et al. (24.7%).[7,10,25] Additionally, 87.8% knew NSV was free of charge, compared

Table 4. Univariate and Multivariable Logistic Regression Analysis Showing Predictors Favourable Attitude regarding NSV among the Study Participants: (n=346)

Variable	N (%) / Median [IQR]	Favourable Attitude	COR (95% CI)	AOR (95% CI)
Age of the study participants in years:	38 [30,44]	-	0.99 (0.96-1.02)	1.05 (0.98-1.13)
Age of the partner in years:	32 [27,38]	-	0.98 (0.95-1.01)	**0.91 (0.84-0.99)**
Duration since marriage in years:	12 [5,18]	-	0.98 (0.96-1.01)	1.02 (0.95-1.09)
Educational level of the study participants in completed years of schooling:	12 [10,15]	-	**1.14 (1.01-1.21)**	1.05 (0.96-1.15)
Occupation of the participant:				
Unskilled	105 (30.3)	39 (37.1)	Ref.	Ref.
Semi-Skilled	99 (28.6)	55 (55.6)	**2.11 (1.21-3.70)**	1.27 (0.67-2.40)
Others	142 (41.0)	86 (60.6)	**2.60 (0.55-4.37)**	1.40 (0.75-2.61)
Religion:				
Hindu	311 (89.9)	169 (54.3)	**2.60 (1.23-5.49)**	2.48 (0.97-6.32)
Others	35 (10.1)	11 (31.4)	Ref.	Ref.
Caste:				
SC/ST	48 (13.9)	23 (47.9)	0.83 (0.45-1.52)	1.02 (0.52-1.99)
Others	298 (86.1)	157 (52.7)	Ref.	Ref.
Number of Family Members:	6 [5,7]	-	0.99 (0.92-1.06)	1.03 (0.94-1.13)
Number of Children:	2 [2,3]	-	0.86 (0.73-1.02)	1.14 (0.88-1.48)
PCMI: (in USD)				
< 35.9	**164 (47.4)**	69 (42.1)	Ref.	Ref.
≥ 35.9	182 (52.6)	111 (61.0)	**2.15 (1.40-3.31)**	1.50 (0.82-2.72)
Knowledge regarding NSV:				
More	211 (61.0)	137 (64.9)	**3.96 (2.50-6.27)**	**2.96 (1.78-4.91)**
Less	135 (39.0)	43 (31.9)	Ref.	Ref.

NSV: Non Scalpel Vasectomy; SC: Scheduled Caste; ST: Scheduled Tribe; PCMI: Per Capita Monthly Income; USD: United States Dollar; COR: Crude Odds Ratio; CI: Confidence Interval; AOR: Adjusted Odds Ratio. Significant CORs and AORs are being highlighted.

to 54.2% in Shafi et al.[10] Our study found that 51.4% knew about government incentives for undergoing NSV, higher than Kishore et al. (29.2%) and Shrivastava et al. (6.5%).[7,25] However, only 17.9% were aware of government insurance for NSV-related complications or failures, less than the 26.4% reported by Kishore et al., but more than the 4.1% reported by Shrivastava et al.[7,25] Overall, 61.0% had good knowledge about NSV, which is higher than the 32.8% reported by Shafi and Mohan et al.[23] And aligns with Mahapatra et al.'s findings (43,0%) in Jharkhand.[16] The variability in these observations may be due to differences in study populations; our study was outpatient-based, while others, except Mahapatra et al., were community-based.[16] Shafi et al. and Sangam et al. conducted their studies in urban populations.[10,12] And while Kishore et al. and Shrivastava et al. focused on rural populations.[7,25] Mahapatra et al. included community healthcare workers as their study population.[16]

Educational attainment was positively correlated with knowledge in our study, with each additional year of schooling increasing the likelihood of greater knowledge by 19%. This finding is consistent with Dejene Wolde et al. in Ethiopia and White et al. in the USA.[13,15] Additionally, 61.6% of participants believed NSV is better than female sterilization, unlike Sood et al. in Punjab.[26] And Patel et al. in Dadra and Nagar Haveli, where only 31.0% and 20.3% respectively shared this belief.[9] Only 52.0% of participants had a favourable attitude towards NSV in our study. Only 1.7% of participants had undergone NSV in our study, similar to Sood et al. (2%).[26] But less than Shafi and Mohan et al. (5%).[23] This rate is higher than the national average (0.3%).[22] And the Jharkhand state average (0.4%), and similar to Shrivastava et al. (1.2%) and Kishore et al. (0.6%).[7,21,25] Contraception is a shared responsibility of both men and women, but over the years, family planning programs have been mostly targeted towards women, which neglects the role of men.

Willingness to undergo NSV among those who had not yet done so was 41.8%, higher than rates reported by Chinnaiyan et al. (37.1%) in Chennai, Sangam et al. (22.7%), Shrivastava et al. (14.1%), Patel et al. (13.0%), and Sood et al. (11.0%).[9,12,17,25,26] Participants willing to undergo NSV had significantly higher levels of knowledge (71.1%) and more favourable attitudes (59.9%) towards the procedure. This finding aligns with Nesro et al.'s study in Ethiopia, which indicated that the intention to use vasectomy was strongly predicted by good knowledge and positive attitudes.[5] These results underscore the importance of educational interventions and attitude-shifting strategies in increasing the acceptance of NSV.

The primary reason for the low acceptance of NSV was a lack of awareness, cited by 34.4% of participants. This contrasts sharply with Shafi et al. where only 0.6% mentioned lack of awareness, but aligns more closely with Sharma et al. in Nagpur, where 29.2% cited lack of awareness as a barrier.[8,10] Misconceptions about NSV were reported by 4.0% of participants, significantly lower than the 35.9% reported by Shafi et al.[10] Concerns about side effects were mentioned by 17.3% of participants, comparable to the 12.5% reported by Shafi et al.[10] Fear of reduced masculinity was a reason for 8.7% of participants, much lower than the 22.5% found by Sangam et al.[12] Additionally, fear of surgery was mentioned by 7.5% of participants, substantially lower than the 51.3% reported by Kishore et al. and the 27.6% found by Sharma et al.[7,8]

The implications of these findings highlight the urgent need for targeted educational interventions to increase awareness and dispel misconceptions about NSV. Comprehensive public health campaigns and community engagement are essential to significantly improve the acceptance and uptake of NSV. Enhancing pre- and post-procedure counselling and leveraging healthcare providers to disseminate accurate information can further mitigate fears and promote positive attitudes towards NSV. These efforts are crucial for balancing family planning responsibilities between men and women and enhancing reproductive health outcomes. Furthermore, implementing policy support and incentive schemes can motivate more men to consider NSV, ultimately contributing to a more effective and equitable family planning program.

The study had several limitations. Firstly, it was conducted at a single tertiary healthcare facility, which may not have been representative of the entire population in Eastern India. Consequently, the findings might not generalize to other regions or healthcare settings. Secondly, the study relied on self-reported data, which could have been subject to biases, including recall and social desirability biases, meaning participants might have provided responses they deemed socially acceptable rather than their true beliefs or behaviors. Thirdly, as a cross-sectional study, it captured data at a single point in time, making it difficult to establish causality between knowledge, attitudes, and practices regarding NSV. Lastly, the study did not extensively explore the deep-rooted cultural and social factors that might influence the acceptance of NSV, which could be critical for addressing barriers to its uptake.[26-28]

CONCLUSION

The study revealed moderate awareness about NSV among male outpatients in a tertiary healthcare facility in Eastern India, but significant gaps in knowledge and favourable attitudes persisted. Primary barriers to acceptance included lack of awareness and misconceptions, with a small percentage having undergone the procedure. Educational attainment was positively correlated with knowledge, underscoring the need for targeted educational interventions. To improve NSV acceptance and uptake, we recommend comprehensive awareness campaigns, enhanced counselling, community engagement, and clear information about government incentives and insurance coverage. These strategies are crucial for addressing misconceptions, alleviating fears, and promoting NSV as a viable male contraception method, thereby contributing to balanced family planning efforts.

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