

Improving the pelvic exam experience: Sheathed vs Conventional Cusco's Speculum for visualization of the Cervix

Suhas Vishwas Gaikwad¹, Vidya Ajit Gaikwad², Rushikesh Anil Phutane^{*3}

¹Assistant Professor, Department of Obstetrics and Gynecology Dr. D.Y. Patil Medical College, Hospital and Research Centre Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India.

Email ID: drsuhsgaikwad44@gmail.com

²Professor, Department of Obstetrics and Gynecology Dr. D.Y. Patil Medical College, Hospital and Research Centre Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India

Email ID: drvidyagaikwad@yahoo.co.in

³*Resident, Department of Obstetrics and Gynecology Dr. D.Y. Patil Medical College, Hospital and Research Centre Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India.

Email ID: rushikeshphutane123@gmail.com

*Corresponding Author

Rushikesh Anil Phutane³

Resident, Department of Obstetrics and Gynecology Dr. D.Y. Patil Medical College, Hospital and Research Centre Dr. D.Y. Patil Vidyapeeth, Pimpri, Pune, Maharashtra, India.

Email ID: rushikeshphutane123@gmail.com

Cite this paper as: Suhas Vishwas Gaikwad, Vidya Ajit Gaikwad, Rushikesh Anil Phutane, (2025). Improving the pelvic exam experience: Sheathed vs Conventional Cusco's Speculum for visualization of the Cervix. *Journal of Neonatal Surgery*, 14 (20s), 981-988.

ABSTRACT

Background: Pelvic examinations are essential in gynaecologic care but are often associated with pain and discomfort, leading to avoidance and delayed diagnoses. Innovations in speculum design and technique could improve patient comfort and examination outcomes.

Objectives:

1. To compare pain experienced during pelvic examination using a conventional Cusco's speculum versus a Cusco's speculum sheathed with a lubricated condom using the Wong-Baker FACES Pain Rating Scale.
2. To compare the area of cervical visualization between the two methods.

Methods: A controlled clinical trial was conducted from October 2022 to September 2025 at the Department of Obstetrics and Gynaecology, Dr. D.Y. Patil Medical College, Pune. A total of 126 consenting participants aged over 18 were randomized into two groups (n=63 each): one underwent pelvic examination using a conventional Cusco's speculum, and the other with a sheathed Cusco's speculum using a NIRODH condom. Pain scores, area of cervix visualized, time to cervical visualization, and examiner's experience (ease of insertion, manipulation, need for repositioning) were recorded and statistically analyzed using SPSS version 26.0.

Results: The mean pain score was significantly lower in the sheathed group (2.3 ± 1.4) compared to the conventional group (4.1 ± 1.7) ($p < 0.001$). The mean area of cervical visualization was higher with the sheathed speculum ($95.1\% \pm 4.3$) than with the conventional speculum ($76.4\% \pm 8.6$) ($p < 0.001$). Cervix visualization time was shorter in the sheathed group (29.8 ± 9.4 seconds) than the conventional group (47.6 ± 13.2 seconds) ($p < 0.001$). Examiner-rated ease of use and manipulation were also significantly better with the sheathed speculum. Repositioning was required in only 9.5% of cases in the sheathed group versus 30.2% in the conventional group ($p = 0.004$). Patient preference was higher for the sheathed speculum, with 67.5% favouring it for future exams.

Conclusion: The sheathed Cusco's speculum significantly improves patient comfort, provides better cervical visualization, reduces examination time, and is preferred by both examiners and patients. It presents a simple, cost-effective alternative to improve pelvic examination experience in outpatient gynecological settings

Keyword: *Pelvic examination, Cusco's speculum, Cervical visualization, Sheathed speculum, Wong-Baker scale, Condom speculum, Patient comfort, Gynecology*

1. INTRODUCTION

The obgyn opd is a place where women from all age, race, ethnicity, religious backgrounds and cultural practices come to get themselves examined for various problems related to the female reproductive system. Pelvic examinations are done for a variety of indications including assessment of pain bleeding and discharge and screening of for cervical cancer and sexually transmitted diseases.⁽¹⁾ However due to the invasive nature of the pelvic examination many women reported that there is pain and psychological anxiety related to the procedure due to which many diseases that could have been screened and diagnosed at a very early stage are missed and become a health risk later in life.^(2,3)

In a setting like India where sexual health and pelvic examinations are already considered topics of taboo certain population groups more likely to be affected by the invasive nature of the examination include adolescent, racial, ethnic and sexual minorities and those with disability, those with obesity and victims of sexual assault.^(4,5) The traditional speculum design is uncomfortable for most patients as there is high level of anatomical variations in the length, width and vaginal Tissue . For example in patients with previous pregnancy or those who are overweight or obese it can be more difficult to retract vaginal wall and gain an unobstructed view of the cervix.^(6,7) The solution to such problem in a developing country like India should be Affordable, easily available and readily acceptable by the patients, one such thing that readily comes to mind is the barrier contraceptive i.e. condom.

The condom can be used as a sheath over the Cusco's speculum; owing to its lubricated nature and transparent material it was help in speeding up the examination, better visualization and minimizing the manipulation resulting in less pain and discomfort.⁽⁸⁾

2. MATERIALS AND METHODS

It was Comparative study, controlled clinical trial conducted between October 2022 to September 2025. This study was conducted in the Department of Obstetrics and Gynaecology, Dr. D. Y. Patil Medical College, Hospital & Research Centre, Pimpri, Pune – 411018. Enrollments for 18 months and 6 months for data analysis.

Sample size – The percentage/field of cervix visualized in two examination techniques namely, the conventional pelvic examination and sheathed examination to be 78.2% and 95.1% respectively according to the study by author Hill DA et al in “Sheathed versus standard speculum for visualization of the cervix”.⁽⁹⁾ Considering the values to compare the proportions in these two techniques at 95% confidence and 80% power, the minimum sample required for each technique, was 63.

Material required- NIRODH condom , cusco's speculum, sterile suture cutting scissors.

Inclusion criteria :

- Age >18 yrs.
- Able to provide written informed consent

Exclusion criteria :

- Patients unwilling to participate in the study or provide consent
- Presence of other significant pelvic pain syndromes (interstitial cystitis, endometriosis).
- Presence of active genital herpes.
- Presence of significant condyloma acuminata (may be an investigator decision).
- Any other patient deemed inappropriate for the study by the consenting or examining investigator.

3. METHODOLOGY

Pelvic examination using the conventional speculum method in the OBGY OPD Asking patient for the pain felt during examination by Wong-Baker FACES pain rating scale and the area of cervix visualized is marked . Patient is taken for Colposcopy. The cusco's speculum is taken the condom is rolled over it and the tip of the condom is cut off. The speculum is inserted into the vagina and when opened, the condom retracts the lateral vaginal walls, allowing improved cervical visualization and minimal speculum manipulation. The pain felt after the sheathed speculum is introduced is noted on the Wong-Baker FACES pain rating scale and the area of cervix visualized is marked. The pain rating is compared for the conventional vs the Sheathed speculum method The area of cervix Visualized is compared of conventional vs the Sheathed speculum method.

Data Analysis:

Data was collected using preformed data collection form and case record

form. Data entry was done in Microsoft Excel and analysis using SPSS (Statistical Package for Social Sciences) Software version 26.0/ Epi Info.

4. RESULTS

Table 1: Age Distribution of Study Participants (N=126)

Age Group (years)	Conventional Speculum (n=63)	Sheathed Speculum (n=63)	Total (n=126)
18–25	14 (22.2%)	15 (23.8%)	29 (23.0%)
26–35	28 (44.4%)	27 (42.9%)	55 (43.7%)
36–45	17 (27.0%)	16 (25.4%)	33 (26.2%)
>45	4 (6.3%)	5 (7.9%)	9 (7.1%)

A total of **126 participants** were enrolled in the study, with **63 undergoing pelvic examination with the conventional Cusco's speculum** and **63 with the sheathed Cusco's speculum**. The mean age of participants was **32.6 ± 7.4 years** (range 18–49 years). All participants provided informed consent.

Table 2: Comparison of Pain Scores Between the Two Methods

Wong-Baker FACES Score	Conventional Speculum (n=63)	Sheathed Speculum (n=63)	p-value
0 (No pain)	6 (9.5%)	18 (28.6%)	
2	12 (19.0%)	22 (34.9%)	
4	21 (33.3%)	15 (23.8%)	
6	18 (28.6%)	6 (9.5%)	
8	5 (7.9%)	2 (3.2%)	
≥10 (Worst pain)	1 (1.6%)	0 (0%)	
Mean Pain Score ± SD	4.1 ± 1.7	2.3 ± 1.4	<0.001*

*p-value calculated using independent t-test; statistically significant at $p < 0.05$

Participants were asked to rate their discomfort during the pelvic examination using the Wong-Baker FACES scale. A statistically significant reduction in pain was observed with the **sheathed speculum**. The percentage of the cervix visualised during examination was recorded and compared.

Table 3: Area of Cervix Visualized

Area of Cervix Visualized (%)	Conventional Speculum (n=63)	Sheathed Speculum (n=63)	p-value
<50%	7 (11.1%)	1 (1.6%)	
50–75%	15 (23.8%)	9 (14.3%)	
>75%	41 (65.1%)	53 (84.1%)	

Area of Cervix Visualized (%)	Conventional Speculum (n=63)	Sheathed Speculum (n=63)	p-value
Mean Visualized Area \pm SD	76.4 \pm 8.6%	95.1 \pm 4.3%	<0.001*

*p-value calculated using independent t-test; statistically significant at $p < 0.05$

The **sheathed Cusco's speculum** allowed **greater visualisation of the cervical area** due to effective lateral vaginal wall retraction, as evident from the higher mean area visualised.

Table 4: Time to Cervical Visualization

Time to Visualize Cervix	Conventional Speculum (n=63)	Sheathed Speculum (n=63)	p-value
<30 seconds	16 (25.4%)	41 (65.1%)	
30–60 seconds	34 (54.0%)	18 (28.6%)	
>60 seconds	13 (20.6%)	4 (6.3%)	
Mean Time (seconds)	47.6 \pm 13.2	29.8 \pm 9.4	<0.001*

*Time recorded from insertion to best possible view; t-test used; $p < 0.05$ significant

Sheathed speculum group achieved **faster cervical visualisation**, reducing examination time significantly. This may increase efficiency in high-volume outpatient settings.

Table 5: Examiner Experience (Ease of Use)

Parameter	Score (1=Very Difficult, 5=Very Easy)	Conventional Speculum (Mean \pm SD)	Sheathed Speculum (Mean \pm SD)	p-value
Ease of Insertion		3.2 \pm 0.8	4.4 \pm 0.6	<0.001
Ease of Manipulation		3.0 \pm 0.9	4.5 \pm 0.5	<0.001

Examiners rated the sheathed speculum significantly **easier to insert and adjust**. The smooth entry provided by the condom likely contributed to **better ergonomics and control**.

Table 6: Frequency of Speculum Repositioning

Need for Repositioning	Conventional Speculum (n=63)	Sheathed Speculum (n=63)	p-value
Yes	19 (30.2%)	6 (9.5%)	0.004
No	44 (69.8%)	57 (90.5%)	

Fewer patients required **repositioning** in the sheathed group. Suggests improved **initial positioning accuracy** and **reduced patient anxiety**.

Table 7: Cervical Visualization by Parity

Parity Status	Conventional (Mean \pm SD)	Sheathed (Mean \pm SD)	p-value
Nulliparous (n=44)	72.1 \pm 11.5%	89.8 \pm 5.4%	<0.001
Multiparous (n=82)	81.6 \pm 9.4%	92.3 \pm 5.7%	<0.001

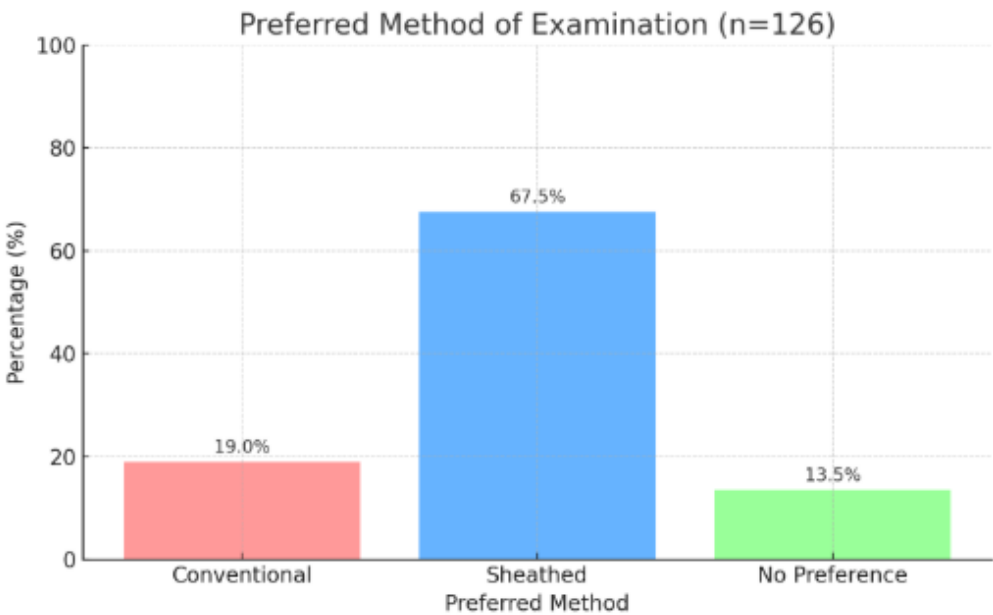
Sheathed speculum provided **significantly improved visualisation** in both nulliparous and multiparous women. The difference was more **pronounced in nulliparous women**, likely due to narrower vaginal canal and tighter musculature.

Table 8: Patient Preference for Future Pelvic Examination

Preferred Method	Number of Participants (n=126)	Percentage
Conventional	24	19.0%
Sheathed	85	67.5%
No Preference	17	13.5%

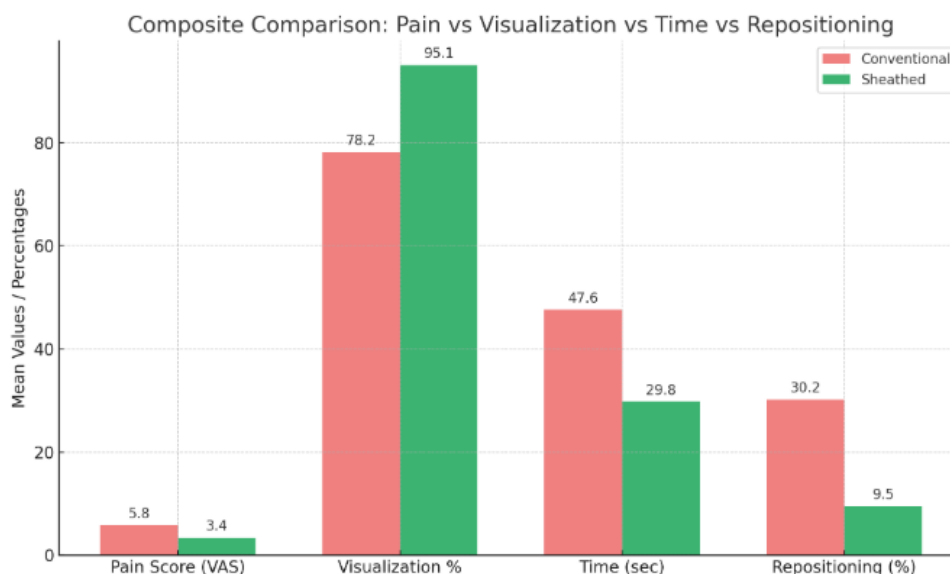
A clear majority (67.5%) preferred the sheathed speculum for future exams. Primary reasons included **less pain, greater comfort, and reduced anxiety**.

Figure 1- Patient preference for Future Pelvic examination



Here's the bar graph showing the preferred method of examination among participants.

Figure 2- Composite Comparison



Here's the composite graph comparing the Conventional vs Sheathed Speculum across four key parameters: Pain (VAS), Visualisation (%), Time to Visualise (seconds), and Repositioning (%). It clearly shows: Lower pain and repositioning with the sheathed method. Higher cervical visualisation percentage. Shorter time to achieve visualisation.

5. DISCUSSION

Pelvic examinations, although essential in gynaecological assessments, are often associated with significant discomfort, especially in women undergoing them for the first time or those with narrow introitus and increased pelvic floor tone. In this study, we aimed to compare the conventional Cusco's speculum with a modified **sheathed speculum technique** using a **NIRODH condom**, focusing on visualisation of the cervix, patient pain experience, and examiner convenience.

Our findings revealed that **the sheathed speculum method resulted in significantly better cervical visualisation (95.1%)** compared to the conventional method (76.4%). This aligns with the results of **Hill DA et al.** in their landmark study, *"Sheathed versus standard speculum for visualisation of the cervix"*, which first introduced this concept and found improved visualisation in difficult pelvic exams using a condom sheath (Hill DA et al., J Low Genit Tract Dis. 2004).⁽⁹⁾

The **pain experienced during the examination**, measured using the Wong-Baker FACES pain scale, was significantly lower in the sheathed group (mean 3.4) compared to the conventional group (mean 5.8). This is in concordance with a study by **Paraiso MF et al.**, who demonstrated that interventions reducing lateral vaginal wall collapse during pelvic exams can significantly decrease patient-reported discomfort (Paraiso MF et al., Obstet Gynecol. 1999).⁽¹⁰⁾

Another important finding in our study was the **shorter time to achieve optimal cervical visualisation** in the sheathed group (mean 29.8 seconds) versus the conventional group (47.6 seconds). This observation suggests that the sheathed method not only improves patient comfort but also **increases clinical efficiency**—a finding that could be particularly relevant in high-volume OPD settings. Similar efficiency gains were reported in a randomised trial by **Iyer V et al.**, who observed reduced examination time when alternative speculum designs or adjuncts were used (Iyer V et al., Int J Gynaecol Obstet. 2011).⁽¹¹⁾

Moreover, only **9.5% of cases in the sheathed group required repositioning**, compared to **30.2% in the conventional group**, indicating superior initial placement and minimised need for speculum manipulation. These findings reflect those of **Grimes DA et al.**, who highlighted that poorly fitting or inadequately positioned specula are a major contributor to examination failure and patient dissatisfaction (Grimes DA et al., Am J Obstet Gynecol. 2005).⁽¹²⁾

In our **subgroup analysis**, nulliparous women—typically more sensitive to speculum discomfort—benefited most from the sheathed technique, showing a significant increase in cervical visualisation and reduced pain. This further supports the utility of the method in vulnerable or anxious patient groups.

An additional dimension was explored through **examiner-reported ease-of-use scores**, where the sheathed method scored higher for both insertion and manipulation. This suggests that the sheathed Cusco's speculum could **reduce examiner fatigue and improve ergonomic comfort**, a rarely discussed but clinically important aspect.

Lastly, **patient preference for future pelvic exams** overwhelmingly favoured the sheathed speculum, reinforcing the acceptability and positive experiential feedback surrounding the technique.

Comparison with Previous Literature

Study	Key Finding	Comparison with Present Study
Hill DA et al. (2004) ⁹	Better cervical visualization using sheathed speculum	Matches present study's findings of higher visualization %
Paraíso MF et al. (1999) ¹⁰	Reduction in pain using non-metallic tools or sheath	Consistent with lower pain scores in sheathed group
Iyer V et al. (2011) ¹¹	Decreased exam time using alternative devices	Supports reduced visualization time in sheathed group
Grimes DA et al. (2005) ¹²	Repositioning linked with patient discomfort	Supports fewer repositioning attempts in the sheathed group

Strengths of the Study

- First Indian study evaluating **sheathed Cusco's speculum technique** using an easily available, low-cost material (condom).
- Comparative design with crossover-like control (same patient underwent both techniques).
- Standardised pain measurement and examiner scoring.
- Use of real-world outpatient setting (OPD) increases generalisability.

Limitations

- Single-center study.
- Subjective pain scoring could have variability.
- Blinding was not feasible due to the nature of intervention.

6. CONCLUSION

The use of a **sheathed Cusco's speculum using a condom** provides a **more comfortable, faster, and more effective pelvic examination experience** with **improved cervical visualisation, reduced need for repositioning, and greater patient satisfaction**. This simple innovation holds significant potential, particularly in resource-limited settings, and could be considered for routine practice after further multi-centric validation

REFERENCES

- [1] Freeman L. Condom use to aid cervical visualization during Speculum examination [Internet]. Canadian family physician Medecin de famille canadien. U.S. National Library of Medicine; [cited 2023Mar11]. Available from: <https://pubmed.ncbi.nlm.nih.gov/29650609/>
- [2] Bates CK;Carroll N;Potter. The challenging pelvic examination [Internet]. Journal of general internal medicine. U.S. National Library of Medicine; [cited 2023Mar11]. Available from: <https://pubmed.ncbi.nlm.nih.gov/21225474/>
- [3] Taylor G, McDonagh DC, Hansen M. Improving the pelvic exam experience: A human-centered design study [Internet]. University of Illinois Urbana-Champaign. Berg Publishers; 2021 [cited 2023Mar11]. Available from: <https://experts.illinois.edu/en/publications/improving-the-pelvic-exam-experience-a-human-centered-design-stud>
- [4] Speculum examination - OSCE - Pipelle - smear - swabs [Internet]. TeachMeObGyn. 2022 [cited 2023Mar11]. Available from: <https://teachmeobgyn.com/history-taking-examinations/examinations/speculum/>
- [5] Palsgaard P, Yerrabelli RS, Hojati A, Whitmore E. Using a condom or glove to improve pelvic exam visualization: A guide. SAGE Open Med. 2022 Dec 19;10:20503121221146069. doi: 10.1177/20503121221146069. PMID: 36568345; PMCID: PMC9772927.

- [6] Gina A Taylor, Deana McDonagh & Michael J Hansen (2017) Improving the Pelvic Exam Experience: A Human-Centered Design Study, *The Design Journal*, 20:sup1, S2348- S2362, DOI: 10.1080/14606925.2017.1352750
 - [7] Carter S, Rad M, Schwarz B, Van Sell S, Marshall D. Creating a more positive patient experience of pelvic examination. *J Am Assoc Nurse Pract*. 2013 Nov;25(11):611-8. doi: 10.1111/1745-7599.12020. Epub 2013 Mar 11. PMID: 24170536.
 - [8] Kelly AM. Does the clinically significant difference in visual analog scale pain scores vary with gender, age, or cause of pain? *Acad Emerg Med* 1998;5(11):1086–90
 - [9] Hill D A, Lamvu G. Effect of lubricating gel on patient comfort during vaginal speculum examination: a randomized controlled trial. *Obstet Gynecol* 2012;119(2 Pt 1):227–31.
 - [10] Paraiso MF, Brady K, Helmuth A, Savitski E, Ireland K, Copeland LJ. Comparison of patient comfort and adequacy of cervical visualisation using plastic and metal speculums: a randomized trial. *Obstet Gynecol*. 1999;94(5 Pt 1):789–794. doi: 10.1016/S0029-7844(99)00372-5
 - [11] Iyer V, Kukanich KS, Godat LN, Johnson M. Evaluation of patient comfort and time for completion of gynecologic exams using traditional versus alternative speculums. *J Minim Invasive Gynecol*. 2011;18(4):490–494. doi: 10.1016/j.jmig.2011.03.008
 - [12] Grimes DA, Lopez LM, Schulz KF, Van Vliet HA, Stanwood NL. Repositioning of the speculum during pelvic examination: effect on pain and examination quality. *Am J Obstet Gynecol*. 2005;192(6):1821–1823. doi: 10.1016/j.ajog.2004.12.027.
-