Sexual Medicine, 2025, **13**, qfaf022
https://doi.org/10.1093/sexmed/qfaf022
Original Research

Methods, practices, and complications related to the use of artificial penile nodules within the French Guiana penitentiary

Jeremy Vergez, MD[1,2], Anaïs Baudot, RM, MSc[3], Loïc Epelboin, PhD[4], Sébastien Rabier, MSc[5], Evelyn Vienrendeels, MSN[2], Mathieu Nacher, PhD[5], Aude Lucarelli, MD[6], Timothee Bonifay, MD[2,5,*]

[1]Department of General Medicine, University of the French West Indies, Pointe-à-Pitre, Guadeloupe 97100, France
[2]Unité sanitaire en milieu pénitentiaire, Centre Hospitalier de Cayenne 97306, French Guiana
[3]Croix Rouge Française, Cayenne 97306, French Guiana
[4]Unité des Maladies Infectieuses et Tropicales, Centre Hospitalier de Cayenne, Cayenne 97306, French Guiana
[5]Centre d'Investigation Clinique Antilles-Guyane, Inserm 1424, Centre Hospitalier de Cayenne, Cayenne 97306, French Guiana
[6]Coordination Régionale de la lutte contre le VIH et les infections sexuellement transmissibles Guyane, Centre Hospitalier de Cayenne, Cayenne 97306, French Guiana
*Corresponding author: Centre d'Investigation Clinique Antilles-Guyane, Centre hospitalier de Cayenne – Av des flamboyants, Cayenne 97306, French Guiana. Email: timothee.bonifay@gmail.com

Abstract

Background: Artificial penile nodules (APNs) are small, handmade objects inserted under the penile skin, a practice deeply rooted in the prison environment of French Guiana, raising significant concerns related to sexual health, including complications and an increased risk of sexually transmitted infections (STIs).

Aim: The primary objective of the current study was to investigate APN practices, methods, and complications in prison and to identify risk factors for complications among APN users and their sexual partners.

Methods: This cross-sectional study was conducted among adult male detainees in June 2023 at the French Guiana Penitentiary (FGP). Eligible participants completed an anonymous 47-question survey addressing sociodemographic data, APN practices, and sexual health. Facilitators played a critical role in distributing and collecting the questionnaires, which were available in five languages to accommodate the prison's population ethnogeographic diversity. Data analysis was conducted using logistic regression to identify risk factors associated with complications.

Outcomes: Outcomes included the prevalence of APN use among detainees, the proportion of individuals experiencing complications, the association between APN characteristics (number and placement) and partner-related complications, as well as the rates of condom breakage and self-reported STI history.

Results: Among 779 eligible detainees, 132 participated (17%). The majority were under 35 years old (67%), and 69% reported having APNs, with a median of 5.2 nodules per user (range: 1-22). The main motivation for APN use was enhancing partner satisfaction (60%), while 5% cited intent to harm. Complications were reported by 25%, including pain (52%), bleeding (41%), and infections (35%). Partner-related complications (pain or bleeding) were significantly associated with having five or more APNs and placement in the foreskin of the penis.

Clinical Implications: Given the high prevalence of APNs in the prison setting and their associated health risks, targeted health education and harm reduction strategies are essential to mitigate complications and promote informed decision-making among detainees.

Strengths and Limitations: The main limitation of this study was its reliance on self-reported questionnaires completed in cells, which may have affected confidentiality, response accuracy, and participation due to prison dynamics and literacy barriers. However, the approach provided valuable insight into a stigmatized topic, and collaboration with facilitators and staff helped achieve meaningful participation.

Conclusion: APNs are deeply rooted in prison culture in French Guiana but pose significant health risks. Findings underscore the need for targeted health education to address these risks, particularly focusing on reducing partner-related complications and promoting informed decision-making about APN practices.

Highlights

- Despite their widespread use, APNs pose significant health risks, including pain, infections, and complications for sexual partners, with nearly half of users reporting partner-related issues.
- This study underscores the need for targeted health education interventions to address these risks and promote safer practices within the penitentiary system.
- Nearly 70% of detainees reported having artificial penile nodules, with a median of 5.2 nodules per user, highlighting the prevalence of this practice in French Guiana's prisons.
- A significant link was found between having five or more nodules and partner complications, such as pain or bleeding, emphasizing the impact on sexual health.

Keywords: artificial penile nodules (APNs); body modification; sexual life; prison practices; French guiana.

Received: January 22, 2025. **Revised:** March 12, 2025. **Accepted:** March 17, 2025

Introduction

History and use of artificial penile nodules

Commonly known as "bouglous" or "dominos" in French Guiana, artificial penile nodules (APNs) are small, spherical or ovoid objects inserted under the penile skin. Typically crafted in prison settings from plastic materials such as domino pieces or toothbrush handles, APN serve various purposes beyond sexual enhancement, including body image modification (penis enlargement), cultural identity, and, in rare cases, as a means of inflicting pain on a partner.[1,2] APNs are distinct from "uro-genital implants," which are used for therapeutic purposes in treating erectile dysfunction.

The practice of genital modification dates back at least to the 6th century in ancient India, where the Kama Sutra, primarily a marital guide, described methods for enhancing sexual pleasure, including genital ornaments.[3] Over centuries, the practice spread across Asia. During the 14th and 15th centuries, Chinese explorers documented penile adornments among men in Siam (modern-day Thailand), associating them with social status and aesthetics.[4] In the 16th century, Antonio Pigafetta, a companion of Ferdinand Magellan, noted this practice in regions like the Philippines and Borneo. Other records describe "tugbuk" and "sakra" used in Southeast Asia, indicating a range of genital modifications introduced early in life, similar to circumcision.[3]

The first scientific article on APN was published in 1894, describing penile modifications among the Batak tribe in Indonesia.[2] The 20th century saw further studies documenting APN globally. In 1953, a medical case in Argentina described a 70-year-old man with three asymptomatic APN implanted during his youth.[5] Further reports emerged from Thailand in 1975, detailing APN in young men aged 21–30 who reported no complications.[6] This practice spread to other all-male environments, including the military, maritime communities, criminal networks, prisons and became associated with drug users and lower socioeconomic groups.[7] This practice seems to be spreading, even in prisons in the US and in South Africa.[8,9]

In French Guiana, a French territory located on the northern coast of South America, the use of APN likely arrived via Surinamese prisoners who escaped during the 1986–1992 civil war, bringing the practice to this French territory.[10] Suriname, with historical ties to Indonesian labor migration, may have adopted these practices from Asian traditions. The term "bouglou" derives from "boegroe," meaning "small ball" in the Surinamese Maroon language.[11] In French Guiana, the term "domino" is popular because inmates often use dominoes to craft the implants, which they polish against prison walls or floors. Several factors may explain the spread of this practice within the Guyanese prison system. Firstly, APNs are well known in Surinamese and Guyanese prison environments and are not exclusive to French Guiana. The demographic growth and the population dynamics of Western French Guiana over the past 30 years have likely contributed to the acceleration of its diffusion. Lastly, body modification rituals, such as tattoos and piercings, are widely practiced in prison settings, facilitating the adoption of this practice.

Given that APN are typically inserted under precarious sanitary conditions in prison, the procedure often involves three people: one to make the incision, one to hold the penis, and the recipient. Tools are typically improvised, with a sardine can lid often used for the incision. In prison, a rudimentary protocol is followed, where the incision must be superficial and transfixing. The APN is inserted through the first hole, while the second is used to drain serous fluid. The person making the incision takes care to avoid veins to minimize bleeding. Depending on the insertion site, the foreskin can be used as a "compression bandage." Inmates also report dietary practices, such as avoiding dairy and pork products, to reduce infection risk.[12]

Caribbean and French Guiana studies on APN in prisons

In Martinique, a study on APN use was conducted among newly incarcerated individuals from 2011 to 2013, finding a 19.9% prevalence rate of APN use among inmates. Findings showed that APN use was associated with fatherhood, low education levels, risky behaviors (such as tattooing or drug use), and lower socioeconomic status. The median age for APN insertion was 22.7 years.[12] In French Guiana, a cross-sectional study in 2013 found that over half of inmates had APN, with 17.5% having more than 10 implants.[10] Detainees reported drug use, particularly crack and cannabis, as a common factor. Other studies in French Guiana have further examined the relationship between APN and mental health. In 2014, a study found that 29.6% of new detainees reported having APN, with younger, English- or Maroon-speaking individuals and those with substance use histories more likely to have APN. The number of APN increased with age, though there was no association between APN use and the reason for incarceration.[13] A 2015 cross-sectional study estimated an APN prevalence of 68% among male inmates. Cannabis use, alcohol dependency, early sexual initiation, and repeated incarcerations were identified as risk factors. Psychiatric hospitalization and high HIV/STD knowledge scores were negatively correlated with APN use.[14] While most of these studies have focused on the risks of infection and the risk factors for installation, there was little data on practice, feelings and motivations.

Objectives

The primary objective of the current study was to describe APN practices, methods, and complications in prison. The secondary objective was to identify risk factors for complications among APN users and their sexual partners.

Material and methods

Study design and setting

A cross-sectional study was conducted at the FGP center in June 2023.

Study population

The study included all adult male detainees present at the FGP during the study period. Adult female detainees and minors <18 yo of any gender were not included in the study. Participants who did not complete the questionnaire fully or in a way that could be interpreted, newly arrived detainees (<15 days), and those who declined to participate in the study were excluded.

Data collection

Data were gathered through a self-administered anonymous paper questionnaire consisting of 47 questions, distributed to all eligible detainees. The questionnaire covered sociodemographic data and specific topics related to detainees who

reported using APN, as well as a section on sexual practices related to APN. It was available in multiple languages—French, Portuguese (targeting people from Brazil), Sranan Tongo (the common language of the Maroons of the Maroni Rivers, border between French Guiana and Surinam), English (targeting people coming from the Guyana, the former Britannic Guyana) and Spanish (targeting especially people from Dominican Republic and Peru) —to accommodate the diverse linguistic backgrounds within the prison population.

Role of facilitators

Facilitators, selected detainees who represent their cell blocks and interact with the prison administration, played a critical role in the study. These facilitators have previously assisted in health initiatives, such as COVID-19 vaccination campaigns, by conveying accurate information and reducing detainee concerns about health measures. For this study, a meeting was held with facilitators from each cell block to discuss the study's purpose, distribution logistics, and how facilitators could help disseminate accurate information within their blocks. The questionnaire's content was collaboratively reviewed with them to ensure clarity, reducing the risk of misunderstandings that could impact detainee participation. Facilitators also advised on the importance of translations, particularly into Sranan Tongo. Although there was no consensus to translate into French Creole, as most detainees who spoke this language also spoke French.

Questionnaire distribution

Facilitators informed detainees within their respective blocks of the forthcoming questionnaire a week prior to distribution, aiming to foster trust in the study's objectives and mitigate skepticism. They collected information on detainees' preferred language versions (five options), allowing for pre-distribution organization by language and cell block. Posters were also placed in each cell block to further raise awareness. On June 13, 2023, prison staff distributed the questionnaires during dinner, and detainees had 24 hours to complete them. Facilitators collected the completed forms the following evening and submitted them to the responsible officer.

Data analysis

Responses were entered into Kobotoolbox, an online survey software, and then consolidated in a Microsoft Excel spreadsheet, which was subsequently imported into the STATA software 15.0 for statistical analysis. A logistic regression model was applied to identify risk factors associated with APN-related complications both in detainees and their partners, focusing on variables such as nationality, dietary habits, language, and incarceration status.

Regulatory approval

According to the French National Commission on Informatics and Liberty (CNIL), this project qualified as an internal research study, which meant that it did not fall under the "MR00" research methodology framework. The study was registered with the Data Protection Officer of the Cayenne Hospital Center, where an informational poster was created to inform detainees collectively within the sanitary unit.

Table 1. Socio-demographic characteristics of detainees with APNs (n = 87).

	N (%)
Nationality	
France	54 (63)
Brazil	9 (10)
Surinam	9 (10)
Haiti	4 (5)
Guyana	2 (2)
The Netherland	2 (2)
Dominican Republic	1 (1)
NR[a]	6 (7)
Age (years)	
18-25	32 (37)
26-35	29 (33)
36-45	17 (20)
46-55	7 (8)
> 55	1 (1)
NR	1 (1)
Marital status	
Single	43 (49)
Cohabiting	33 (38)
Married	7 (8)
NR	4 (5)
Dependent child	
Yes	56 (65)
No	29 (33)
NR	2 (2)
Multiple sexual partners	
Yes	45 (52)
No	34 (39)
NR	8 (9)
Incarceration Status	
Repeat offender	45 (52)
First-time detainee	38 (43)
NR	4 (5)

[a]Not reported (NR).

Results

Of 779 eligible detainees, 132 (16.9%) participated in the study (Figure 1). Most participants were French (65%), Brazilian (17%) and Surinamese (8%) individuals were also represented. Data revealed that half of the participants were single but 68% had children and 67% of the population was under the age of 35. Approximately 37% reported multiple sexual partners before imprisonment, with an average of 5.9 partners (median of 3.8, range: 1-17). Nearly half of the participants (44%) had previous incarcerations, with a median of 2 incarcerations per person (range: 2-22).

The majority (98%) were already familiar with APNs. Only three detainees were unaware of the practice and were instructed to stop completing the questionnaire. A total of 69% (n = 87) confirmed they currently had APNs, with a median of 5.2 APNs per detainee (range: 1–22) (Figure 2). Among them, nationality distribution was similar to the initial participant pool. The majority were young, with 71% aged between 18 and 35. Additionally, 54% of APN users had prior incarcerations, a reversal of the distribution observed in the initial sample (Table 1).

Motivations, procedures, and APN characteristics

The primary motivation for APN use was enhancing a partner's sexual pleasure, reported by 60% of users. However, a small percentage, 5% (n = 5), reported using APN with the intent to harm or "get back" at female partners. The median

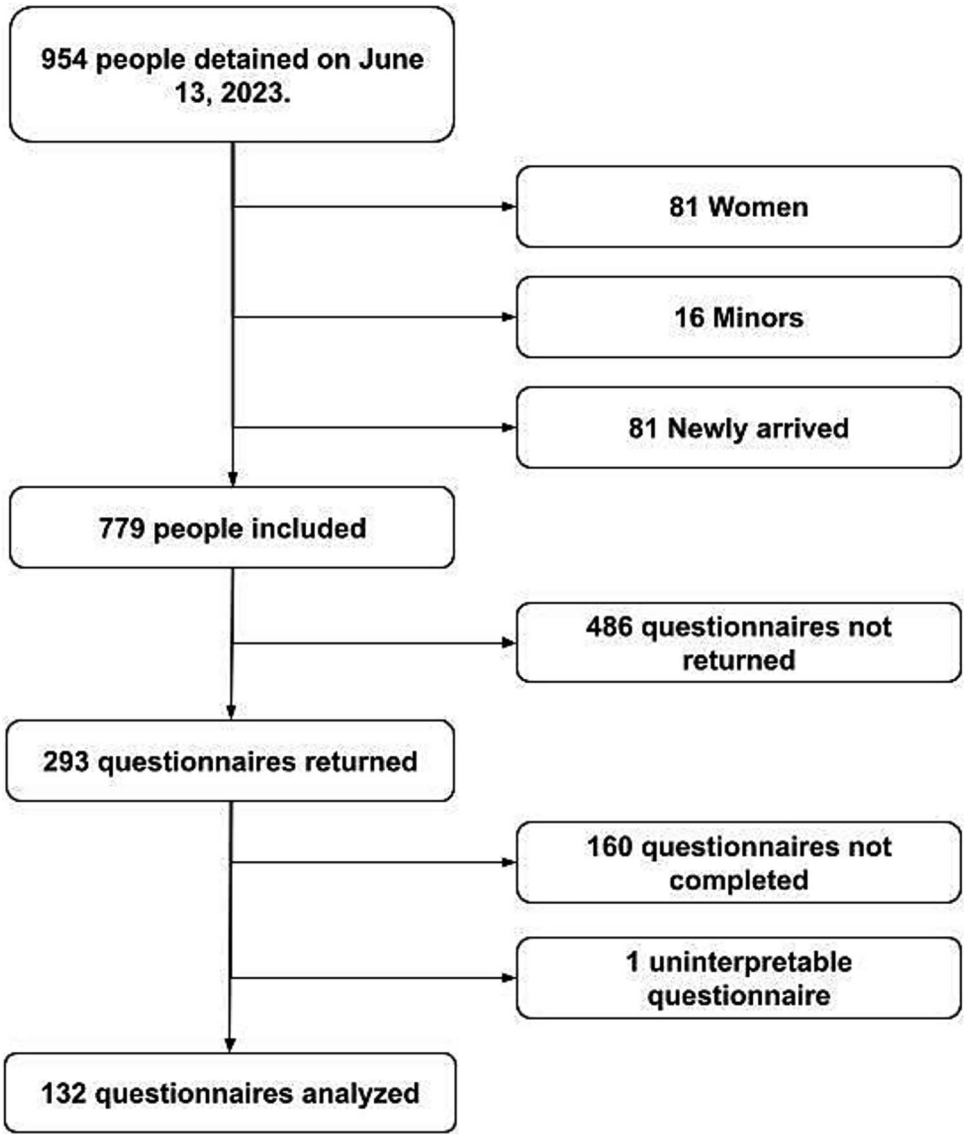

Figure 1. Study flow chart.

age for first APN placement was 20 years (range: 12-52) and 25% had their APNs inserted before the age of 18. Regarding APN dimensions, 70% had at least one APN under 1 cm, while 17% had one that measured 3 cm or more. Additionally, 63% had placed their APN in the foreskin, and nearly all (90%) reported APN insertion occurred in prison, although one-third also had APN placed outside prison. Most detainees used a sardine can lid for skin incision (81%) (Figure 3). Approximately 61% followed specific dietary restrictions post-insertion, avoiding dairy products (65%) and pork (88%). A significant portion (85%) crafted their APN from domino game pieces or toothbrush handles (48%) (Figure 4). Many inmates (53%) created the APN themselves (Table 2). The cost of APNs varied: within the prison, 43% paid with a pack of cigarettes (~€10), while 38% paid €20. Outside the prison, the average cost was €7.50 from informal sellers but could reach up to €50.

Complications and risk factors

A total of 25% of detainees (n = 22) reported experiencing acute complications directly associated with the insertion of APNs. The three main complications were pain (52%), bleeding (41%), and infections (35%). Notably, 34 detainees reported receiving antibiotic treatment (not provided by the healthcare service) (Table 3). Regarding chronic complications, among individuals who had sexual relations with APN, 28% experienced condom breakage, 13% reported personal pain during intercourse due to APN and 49% reported complications for their partners (pain and/or bleeding) (Table 4). Some people reported erectile dysfunction (3%).

No statistically significant association emerged between complications—such as pain, infection, pus discharge, or erectile dysfunction—and sociodemographic data, APN practices, or procedures. The study also examined factors related to partner complications, specifically pain and bleeding during intercourse with APN users. Two significant associations emerged: one with the number of APN per user (OR = 4.25; IC 95% [1.1-17.1]) and the second with the APN's location in the foreskin of the penis ($P = 0.002$; OR = 6.5; IC 95% [1.6-26.3]).

Sexual and relational life

Approximately 48% of participants had removed an APN, with 51% stating they did so upon a partner's request. The

Figure 2. Example of artificial penile nodules in a male detainee (~20 APNs).

Figure 3. Example of a handmade scalpel crafted from a tin can to perform the incision.

ideal number of APN reported was a median of 5. APN users who engaged in sexual activity reported high partner satisfaction (67%). Notably, 39% of users said that partners requested additional APN, whereas 29% asked them to remove existing APN. Among those whose partners requested removal, 76% complied, while 24% ended the relationship.

Figure 4. Example of artificial penile nodules crafted from toothbrush handles.

If a doctor recommended APN removal, 32% would agree, whereas 68% would refuse.

Discussion

Participation rate

The study's participation rate was relatively low at 17%, potentially due to limited time and prevailing mistrust of medical authorities within the prison regarding APN. APN insertion in prison often serves as a form of initiation and personal appropriation, which some inmates may be reluctant to question. Additionally, logistical constraints, movement limitations, and prison overcrowding create barriers to consistent communication between facilitators and inmates. Notably, participation rates varied, some detention area showing a lower participation than others (participation range: 4% to 32%).

APN methods and motivations

The primary motivation for APN insertion, as reported by most participants, was to enhance the sexual pleasure of their partners, aligning with previous studies. A small percentage (5%) reported inserting APNs with the intent to harm or as revenge, an already identified motivation.[1] The median age for the first APN placement in French Guiana was 20 years, compared to 23 years in Martinique, reflecting a younger initiation age among APN users in French Guiana or a possible overall trend toward younger ages, as the Martinique study was conducted 10 years ago.[12] Some cities in Cuba reportedly see initial APN placement as early as age 15.[15] This observation had already been noted, prompting the healthcare unit to act to implement preventive measures in the youth ward following reports of multiple APN insertions.

Table 2. Data related to methods and practices of APN carriers (n = 87).

	N (%)[a]
APN Size	
≤ 1 cm	61 (70)
2 cm	28 (32)
≥ 3 cm	15 (17)
NR[b]	5 (6)
APN Location	
foreskin	55 (63)
Mid-shaft	51 (59)
Base of the penis	24 (28)
NR	5 (6)
Location of Placement	
In prison	78 (90)
Outside prison	28 (32)
NR	3 (4)
Number of People Involved in Placement	
Alone	4 (5)
2 peoples	41 (47)
3 peoples	26 (30)
NR	18 (21)
Incision Tool Used	
Sardine can lid	70 (81)
Razor blade	8 (9)
Other	7 (8)
NR	11 (13)
Antiseptic Used	
Povidone iodine	68 (78)
Alcohol	11 (13)
Other	7 (8)
No antiseptic	2 (2)
NR	9 (10)
Dietary Practices Followed	
Yes	53 (61)
No	23 (26)
NR	11 (13)
Material Used	
Domino	74 (85)
Toothbrush	42 (48)
Glass	3 (4)
Other	3 (4)
NR	5 (6)
Self-Made APN (n = 77) *(90%)*	
Yes	46 (53)
No	31 (36)
NR	10 (12)

[a]The percentages may exceed 100% as detainees could have multiple APNs. [b]Not reported (NR).

Table 3. Data concerning complications related to APN insertion (n = 87).

	n/N (%)
Complications	
Yes	22 (25)
No	50 (76)
NR[a]	15 (17)
Type of Complications (n = 22)	
Pain	15 (52)
Bleeding	12 (41)
Infection	10 (35)
Erectile dysfunction	1 (3)
Other	4 (14)
Treatment (n = 42)	
Antibiotics	34 (81)
Pain killer	13 (31)
Antiseptic	18 (43)
Removal of APN	3 (7)
Other	3 (7)
APN Removal	
Yes	42 (48)
No	39 (45)
NR	6 (7)
Reason for Removal	
At the partner's request	20/39 (51)
Other	18/39 (46)
Both	1/39 (3)

[a]Not reported (NR).

Table 4. Data concerning the sexuality of detainees with APN (n = 87).

	n/N (%)
Sexual Activity with APN	63/80 (79)
Partner Satisfaction	58/60 (97)
Condom Use	40/68 (59)
Condom Breakage	24/55 (44)
Pain Experienced by APN User	11/64 (17)
Infection in APN User	5/61 (8)
Partner Pain	30/59 (51)
Partner Bleeding	15/64 (23)
Request for Additional APN by partner	34/64 (53)
Request for APN Removal by partner	25/67 (37)

APN count per user was generally higher than previous studies,[1,16] with a median of 5.2 nodules per detainee, but comparable to previous studies in French Guiana.[10,13,14]

The study also showed no significant correlation between APN placement location (inside or outside of prison) and complication rates. Due to prison conditions, many APN were inserted in low-light settings, such as exercise yards or with minimal light from mobile phones. The insertion in non-carceral settings is often performed under better hygienic conditions.[2,15] For dietary habits, ∼70% of APN users followed specific dietary restrictions and were particularly avoiding pork (80%). Dietary beliefs among inmates regarding the risk of complications had not been previously documented. While no significant link between diet and complications was found, some studies suggest an association between meat consumption and inflammation, potentially through effects on gut lipopolysaccharides or by directly influencing the immune system to induce chronic systemic inflammation.[17,18] Additionally, many detainees report skin reactions to certain foods, such as pork, upon their admission to detention. These dietary practices seem to be influenced by cultural or habitual factors. However recent publication has shown that alpha-gal syndrome, an allergy to mammalian meat induced by tick bites, is relatively common in French Guiana.[19] This disease could not be investigated in prisoners at the time of the study.

Complications in APN users and sexual health implications

The complication rate observed in this study was approximately twice as high as reported in the literature.[14] This discrepancy may be explained by the study's methodology, which provided detainees with a greater opportunity to express their experiences. In routine clinical practice, prison healthcare services typically only see the most severe complications, leading to an artificially lower complication rate in published data. Notably, the literature frequently highlights an increased prevalence of sexually transmitted infections (STIs) and erectile dysfunction among APN users. However, in our study, STI history was likely misunderstood, as only 8% of participants

reported having had an STI (Table 4). Regarding erectile dysfunction, our findings were significantly lower than the 27% reported in other studies.[20] In general, bleeding and infections remain the two most commonly treated complications at the prison's healthcare unit, though they rarely require specialized medical management.

Two risk factors were identified in the study: the number of APNs (>5) and their placement on the foreskin. These findings appear consistent, although they are rarely reported in the literature, as few studies focus on complications in sexual partners. A more suitable methodology could help establish a clearer correlation between the number of implants and an increased risk of bleeding or pain. Similarly, a distal placement of the APN appears to carry a higher risk of injury compared to placement at the base of the penis.

The perceived ideal number of implants provides additional insight into this practice. The median goal among incarcerated individuals is to have around five APNs; however, the study highlighted that complications in partners appeared to be associated with having more than five APNs. Despite detainees not being informed of these risks, it is evident that this practice does not take partner-related complications into account. A key priority would be to encourage detainees, particularly younger individuals, to reconsider their perceptions of sexual and emotional relationships. Health education programs aimed at developing life skills are already in place and should be a major focus of prevention efforts. In the study, 72% had sexual activity with an APN. Approximatively half of detainees reported complications for their partners (pain and/or bleeding) which may seem contradictory when you consider that 2/3rd of inmates reported using dominoes to enhance female pleasure. Initial data from a study conducted by the French Red Cross in French Guiana [unpublished data], focusing on female partners, indicated that 72% of women reported pain and 57% experienced vaginal injuries or bleeding during intercourse with APN users. These preliminary findings suggest that the rates of partner complications reported in the present study is probably underestimated. Moreover, 59% of APN users reported consistent condom use and as mentioned in previous studies, 44% experienced condom breakage due to APN.[14] Although the link between rupture and APNs cannot be established, it would appear that the rupture rate is higher among wearers than in the literature. The rupture rate is usually between 25 and 30%.[21,22] This raises significant concerns given the high prevalence of STIs in French Guiana's.[23] The study design did not allow for a detailed evaluation of infection risks directly associated with APN use. However, some studies have noted a potential link between APNs and STIs, although causality remains unproven.[20] Our findings revealed a high prevalence of traumatic sexual encounters and condom breakage, both known risk factors for STIs, highlighting an important public health concern.

Study limitations and strengths

The primary limitation of this study was its reliance on self-reported data collected via questionnaires, which inmates completed within their cells, potentially impacting confidentiality. The lack of interviewer presence meant questions were sometimes misinterpreted, affecting response reliability. Constraints related to movement, safety, and prison dynamics also posed challenges, as did low literacy rates among inmates. Facilitators helped with the distribution process, but participation may have been influenced by the social dynamics within different cell blocks.

Despite limitations, the self-administered questionnaire approach provided a snapshot of inmate perceptions and experiences with APNs, a topic often surrounded by stigma. Collaboration between guards, facilitators, and inmates fostered a unique level of solidarity, with participation rates reaching 32% in certain cell blocks. This study paves the way for future research, with a particular focus on the experiences of female partners of APN users.

Conclusion

The study provided a new overview of the methods, practices, and complications related to the use of APN within the French Guiana Penitentiary and identified risk factors for complications among users and their sexual partners. The findings suggest that this phenomenon is spreading outside the carceral system. This situation calls for preventive actions targeting young individuals who lack awareness of the practice, to discourage informal adoption. We also explored the psychosexual aspect by questioning inmates about their partners' satisfaction, which they cited as the primary motivation for APN use. This study also highlighted a link between a high number of APNs and/or their placement on the foreskin with an increased risk of complications in women, thereby suggesting a concrete focus for health interventions.

Acknowledgments

Thanks to all those who contributed to the completion of this study, particularly the healthcare team of the sanitary unit, the guards and administrators of the French Guiana Penitentiary, the facilitators, the team at the Clinical Investigation Centre of the Cayenne Hospital, and to Dr Adriana Gonzalez and Dr Fofana Fode.

Author contributions

J.V.: Conceptualization-Equal, Data curation-Equal, Formal analysis-Lead, Writing original draft-Equal. A.B.: Resources-Equal, Writing—review & editing-Equal. L.E.: Visualization-Equal, Writing—review & editing-Equal. S.R.: Data curation-Lead. E.V.: Investigation-Equal, Resources-Equal. M.N.: Supervision-Equal, Writing—review & editing-Equal. A.L.: Writing—review & editing-Equal. T.B.: Conceptualization-Equal, Data curation-Equal, Supervision-Lead, Writing—original draft-Equal.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Conflicts of interest

The authors declare that they have no competing interests.

References

1. Marzouk E. Implantation of beads into the penile skin and its complications. *Scand J Urol Nephrol*. 1990;**24**(3):167–169. https://doi.org/10.3109/00365599009180852
2. Fischer N, Hauser S, Brede O, Fisang C, Müller S. Implantation of artificial penile nodules—a review of literature. *J*

Sex Med. 2010;**7**(11):3565–3571. https://doi.org/10.1111/j.1743-6109.2009.01659.x
3. Stankov O, Ivanovski O, Popov Z. Artificial penile bodies—from Kama sutra to modern times. *J Sex Med*. 2009;**6**(6):1543–1548. https://doi.org/10.1111/j.1743-6109.2009.01230.x
4. Kirkham CL, Monks SM, Crawford SB. Complications of subcutaneous penile modifications: a discussion of emergency department presentations and management. *Int J Emerg Med*. 2019;**12**(1):22. https://doi.org/10.1186/s12245-019-0241-z
5. Grimaldi A. Cuerpo Extraño De Pene. Exaltacion Del Orgasmo Conyugal Mediante El Injerto De Cuatro Perlas. *Rev Argent Urol*. 1953;**22**(9–12):271–272.
6. Nitidandhaprabhas P. Artificial penile nodules: case reports from Thailand. *Br J Urol*. 1975;**47**(4):463. https://doi.org/10.1111/j.1464-410X.1975.tb04009.x
7. Tsunenari S, Idaka T, Kanda M, Koga Y. Self-mutilation. Plastic spherules in penile skin in yakuza, Japan's racketeers. *Am J Forensic Med Pathol*. 1981;**2**(3):203–207. https://doi.org/10.1097/00000433-198109000-00003
8. Griffith J, Horowitz D. Penile nodules in the penal system. *Cutis*. 2012;**89**(5):237–239.
9. Chateau AV, Makhubele JJ, Dlova NC. Penile nodules in prisoners: "speed humps". *Int J Dermatol*. 2020;**59**(12):1520–1521. https://doi.org/10.1111/ijd.15246
10. About V, Pastre A, Huber F, Couppiè P. Nodules péniens artificiels (« bouglous ») en milieu carcéral en Guyane. *Ann Dermatol Vénéréologie*. 2015;**142**(12):S585. https://doi.org/10.1016/j.annder.2015.10.344
11. Goury L, Migge B, Moese M. *Grammaire du Nengee: Introduction Aux Langues Aluku, Ndyuka et Pamaka. 2e édition*, IRD Éditions; 2017.
12. Droin S. *Implants Peniens en Milieu Carceral a la Martinique : Etat Des Lieux en 2013*, Université des Antilles; 2014.
13. Nacher M, Ayhan G, Arnal R, *et al*. Prevalence and predictors of penile nodules in French Guiana's sole prison facility. *PLoS One*. 2018;**13**(9):e0204808. https://doi.org/10.1371/journal.pone.0204808
14. Parriault MC, Chaponnay A, Cropet C, *et al*. Penile implants and other high risk practices in French Guiana's correctional facility: a cause for concern. *PLoS One*. 2019;**14**(6):e0218992. https://doi.org/10.1371/journal.pone.0218992
15. Ramirez JC, Wickremasinghe PD, Mayol-Velez LX, Izquierdo-Pretel G. 'La Perla Del mar': a case report on subcutaneous penile implants. *Cureus*. 2023;**15**(4):e37155. https://doi.org/10.7759/cureus.37155
16. Kakinuma H, Miyakawa K, Baba S, Suzuki H, Kawada N, Takimoto Y. Penile cancer associated with an artificial penile nodule. *Acta Derm Venereol*. 1994;**74**(5):412–413. https://doi.org/10.2340/0001555574412413
17. Grosso G, Laudisio D, Frias-Toral E, *et al*. Anti-inflammatory nutrients and obesity-associated metabolic-inflammation: state of the art and future direction. *Nutrients*. 2022;**14**(6):1137. https://doi.org/10.3390/nu14061137
18. Vors C, Gayet-Boyer C, Michalski M-C. Produits laitiers et inflammation métabolique: quels liens en phase postprandiale et à long Terme ? *Cah Nutr Diététique*. 2014;**4708**(1):1.
19. Epelboin L, Roche F, Dueymes M, *et al*. Allergy to mammalian meat linked to alpha-gal syndrome potentially after tick bite in the Amazon: a case series. *Am J Trop Med Hyg*. 2021;**105**(5):1396–1403. https://doi.org/10.4269/ajtmh.20-1630
20. Yap L, Butler T, Richters J, *et al*. Penile implants among prisoners—a cause for concern? *PLoS One*. 2013;**8**(1):e53065. https://doi.org/10.1371/journal.pone.0053065
21. Butler SM, Oswalt SB, Hughes CML, Robbins CP, Sundstrom B. Condom acquisition, errors, and breakage among U.S. cisgender college students. *Arch Sex Behav [Internet]*. 2024 [cited 2025 Jan 15]; Available from:;**54**(3):859–871. https://doi.org/10.1007/s10508-024-02998-z
22. Yarber WL, Graham CA, Sanders SA, Crosby RA. Correlates of condom breakage and slippage among university undergraduates. *Int J STD AIDS*. 2004;**15**(7):467–472. https://doi.org/10.1258/0956462041211207
23. Denoel S. *Dépistage et prévalence Des Infections Sexuellement Transmissibles en Milieu carcéral Guyanais français de 2013 à 2020*. Université des Antilles; 2023.

Sexual Medicine, 2025, 13, qfaf022
https://doi.org/10.1093/sexmed/qfaf022
Original Research