



BACKGROUND

- Reducing postoperative opioid use is crucial, especially for TGD patients with higher substance use disorder rates^{1,2,3}.
- Effective pain management is key to preventing complications in TGD vaginoplasty.^{4,5}
- Intraoperative methadone reduces opioid use and pain in other surgeries,^{6,7} but its role in TGD genital surgery is unclear.
- This study aims to explore methadone's effectiveness in TGD vaginoplasty.

METHODS

- Retrospective cohort study of TGD patients undergoing penile inversion vaginoplasty (Feb 2021 - Sep 2023) at one academic institution.
- Outcomes: total opioid MME consumption, average pain scores (POD 0-3), and incidence of respiratory depression.
- Treatment groups: methadone-only, methadone + SAO, and SAO-only.
- Missing data handled using multiple imputation by chained equations.
- Two-part hurdle models used to address excess zeros:
 - Part 1: Logistic regression assessed the odds of opioid use or pain by treatment group.
 - Part 2: Linear regression analyzed MME and pain score trends for non-zero cases.
- Controlled for age, race, BMI, alcohol use, smoking, drug use, psychiatric history, SSRI use, diabetes, HIV status, concurrent orchiectomy, length of stay, and substance use history.
- Significance set at p<0.05.

The Effects of Intraoperative Methadone on Transgender and Gender-Diverse (TGD) Patients Receiving Vaginoplasty

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FIGURES & GRAPHS

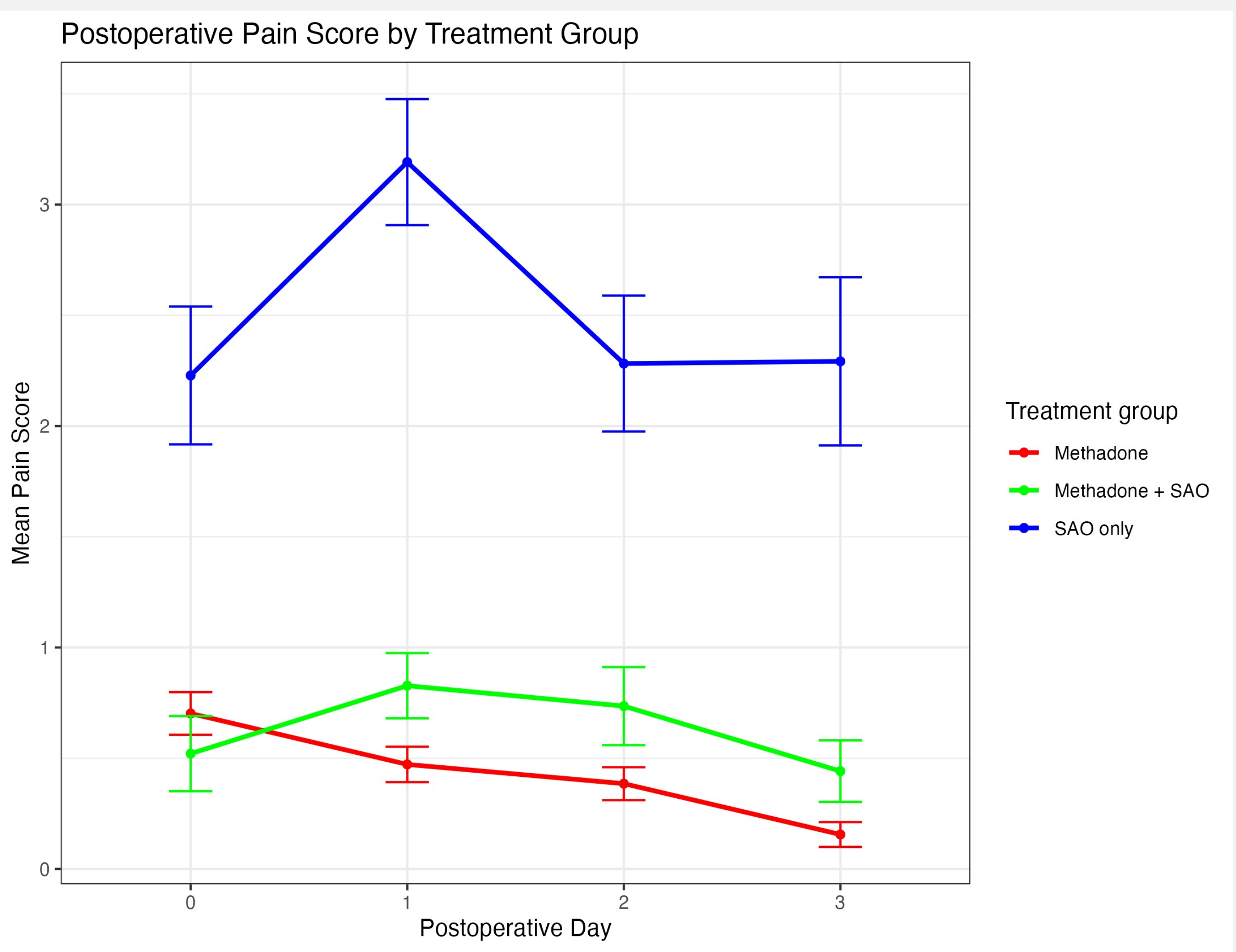
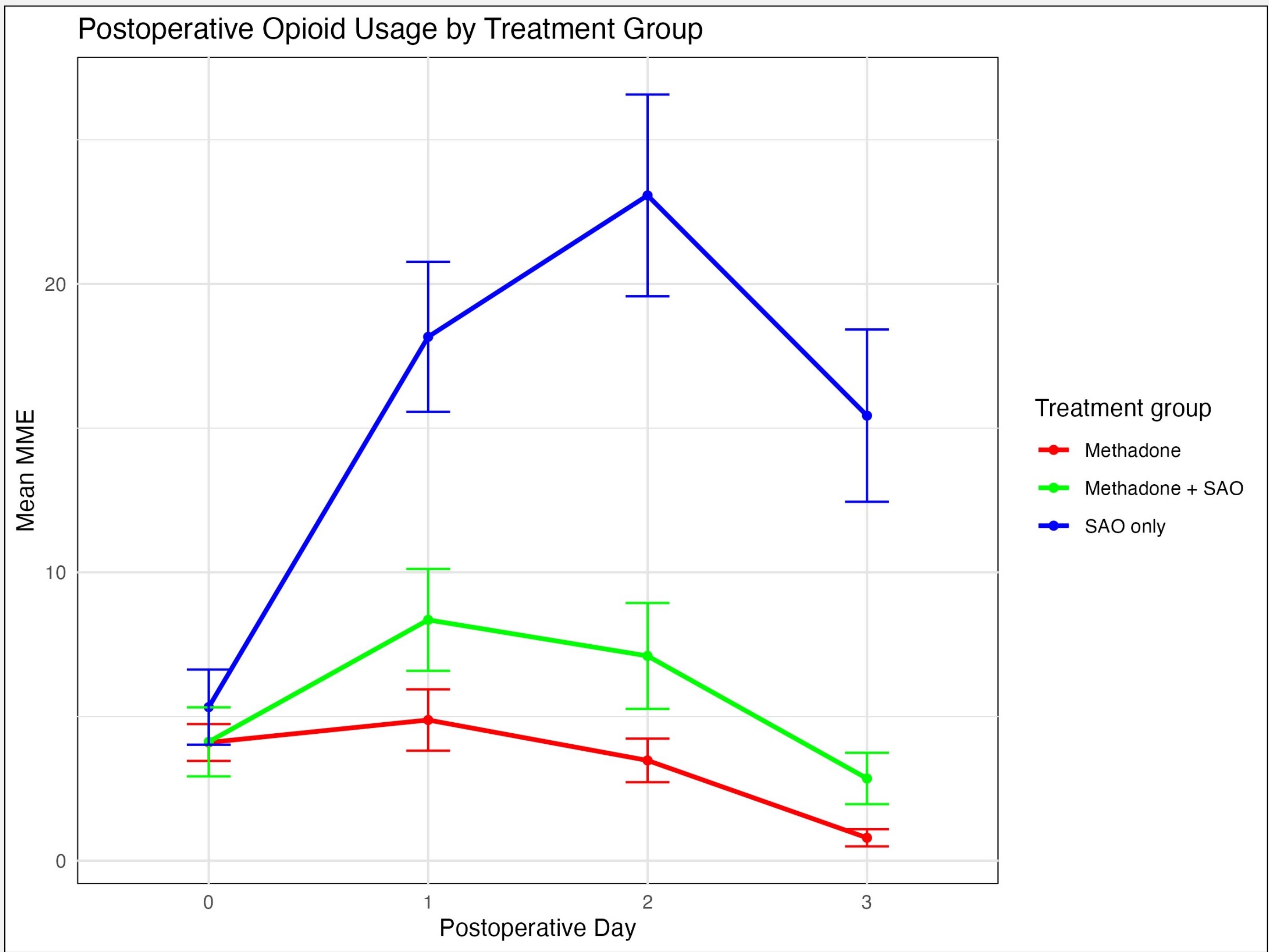


Table 1: Multivariate Associations Between Intraoperative Analgesic Treatments and 1) Consuming Any Pain Med and 2) Reporting Any Pain Among All Patients								
Intraoperative Opioid Category	POD0 (aQR, CI) N = 212	P	POD1 (aQR, CI) N = 212	P	POD2 (aQR, CI) N= 212	P	POD3 (aQR, CI) N = 210*	P
Consumed Any Pain Med								
Short-acting Opioid Only	--	--	--	--	--	--	--	--
Methadone Only	0.45 (0.16, 1.24)	0.12	0.05 (0.01, 0.14)	< 0.001	0.05 (0.01, 0.15)	< 0.001	0.04 (0.01, 0.12)	< 0.001
Methadone + SAO	0.33 (0.11, 1.00)	0.052	0.11 (0.03, 0.35)	< 0.001	0.06 (0.01, 0.19)	< 0.001	0.13 (0.04, 0.41)	< 0.001
Reported Any Pain								
Short-acting Opioid Only	--	--	--	--	--	--	--	--
Methadone Only	0.08 (0.03, 0.23)	< 0.001	0.01 (0.00, 0.04)	< 0.001	0.03 (0.01, 0.10)	< 0.001	0.01 (0.00, 0.04)	< 0.001
Methadone + SAO	0.05 (0.01, 0.15)	< 0.001	0.02 (0.00, 0.11)	< 0.001	0.04 (0.01, 0.15)	< 0.001	0.04 (0.00, 0.14)	< 0.001

POD: Postoperative Day
*: Two patients were discharged at POD2.
Pain Score Scale: 0-10

Table 2: Multivariate Associations Between Intraoperative Analgesic Treatments and 1) Opioid Consumption and 2) Pain Scores Among Patients Who Reported Values Greater Than 0 Only								
Intraoperative Opioid Category	POD0 (Beta, CI)	P	POD1 (Beta, CI)	P	POD2 (Beta, CI)	P	POD3 (Beta, CI)	P
Pain Med Consumption (MME)								
	N = 72		N = 82		N = 65		N = 42	
Short-acting Opioid Only	--	--	--	--	--	--	--	--
Methadone Only	5.16 (-6.37, 10.96)	0.08	-5.41 (-15.73, 4.91)	0.299	-10.77 (-20.11, -1.43)	0.025	-7.00 (-19.86, 5.85)	0.269
Methadone + SAO	7.29 (0.60, 13.97)	0.033	-7.00 (-17.35, 3.35)	0.181	-2.26 (-12.28, 7.76)	0.652	-4.18 (-15.94, 7.58)	0.467
Pain Level								
	N = 85		N = 90		N = 71		N = 45	
Short-acting Opioid Only	--	--	--	--	--	--	--	--
Methadone Only	-0.67 (-1.47, 0.14)	0.103	-1.76 (-2.48, -1.04)	< 0.001	-0.89 (-1.70, -0.07)	0.033	-0.28 (-2.13, 1.58)	0.762
Methadone + SAO	-0.41 (-1.44, 0.63)	0.435	-1.87 (-2.61, -1.13)	< 0.001	-0.36 (-1.24, 0.53)	0.418	-0.135 (-1.97, 1.70)	0.8806

POD: Postoperative Day
Pain Score Scale: 0-10
Only patients who had opioid MMEs and pain scores above 0 were included.

RESULTS

- 212 TGD vaginoplasty patients: methadone-only (123), methadone + SAO (50), SAO-only (39).
- No respiratory depression occurred.
- Methadone-only and methadone + SAO groups had lower odds of needing opioids on POD 1, 2, and 3.
- Methadone + SAO group had higher MME on POD0; methadone-only group consumed less MME than SAO-only on POD2.
- Methadone-only and methadone + SAO patients were less likely to report any pain on POD 0-3.
- Patients with pain reported lower scores in the methadone-only and methadone + SAO groups on POD1 and methadone-only on POD2.

CONCLUSION

- Intraoperative methadone is associated with reduced opioid consumption and lower pain scores in TGD vaginoplasty patients.
- Randomized studies are needed to confirm these findings.
- If confirmed, intraoperative methadone could reduce opioid use, improve outcomes, and support efforts to prevent substance misuse in TGD patients seeking gender-affirming care.

REFERENCES

1. Tittel AR, Abu El-Hawa AA, Bakonyi JC, Fan KL, Del Corral G. Minimizing opioid consumption by eliminating patient-controlled analgesia after penile inversion vaginoplasty with enhanced recovery after surgery (ERAS) protocol. *Andrology*. 2022;30(5):250-260. doi:10.1111/andr.13995.
2. Benjamin R, Tricost AM, Datta S, et al. Opioid complications and side effects. *Pain Physician*. 2008;11(2 Suppl):S105-S120.
3. Hugbo ABW, Reister AJ, Wolfe HL, et al. Opioid pain medication misuse, concomitant substance misuse, and the unmet behavioral health treatment needs of transgender and gender diverse adults. *Drug Alcohol Depend*. 2021;222:108674. doi:10.1016/j.drugdep.2021.108674.
4. Gan TJ. Poorly controlled postoperative pain: prevalence, consequences, and prevention. *J Pain Res*. 2017;10:2287-2298. Published 2017 Sep 25. doi:10.2147/JPR.S144666.
5. Hortschark R, Aba B, Hamdan Jahromi A, Schreier L. Penile inversion vaginoplasty outcomes: Complications and satisfaction. *Andrology*. 2021;9(6):1732-1743. doi:10.1111/andr.13300.
6. Edwards JN, Whitney MA, Smith BB, et al. The role of methadone in cardiac surgery for management of postoperative pain. *BMJ Open*. 2024;10(10):e2023. Published 2024 Mar 22. doi:10.1136/bmjopen-2023-028270.
7. Murphy GS, Szekely AV, Aram MJ, et al. Clinical Effectiveness and Safety of Intraoperative Methadone in Patients Undergoing Posterior Spinal Fusion Surgery: A Randomized, Controlled Trial. *Anesthesiology*. 2017;126(5):822-833. doi:10.1097/ALN.0000000000001859.