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Effectiveness of Chemical Castration Sanctions and the Principle of Non-Discrimination: A Human Rights, Islamic Law, and SDGs Perspective

Muhamad Adystia Sunggara¹, Selcuk Koca²

¹Faculty of Law, Pertiba University, Indonesia

²Kahramanmaraş Sütçü İmam Üniversitesi, Türkiye

adystiasunggara@pertiba.ac.id, selcukkoca@ksu.edu.tr

Abstract

Objective: This study aims to analyze the application of chemical castration sanctions and the principle of non-discrimination from the perspective of criminal law and human rights in Indonesia, as well as to review these policies from the perspective of Islamic law (maqasid al-shariah) and the Sustainable Development Goals (SDGs). **Theoretical framework:** The theoretical framework of this research uses the concept of the rule of law, the principles of criminal law and human rights, the concept of maqasid al-shariah in Islamic law, and the perspective of SDGs related to justice, health, and the reduction of inequality. **Literature review:** A literature review analyzes various laws and regulations, court decisions, and academic studies related to the application of chemical castration sanctions as a legal phenomenon. **Methods:** The research uses normative juridical methods with a literature study approach through the analysis of laws and regulations, court decisions, legal journals, and law enforcement reports. **Results:** The results of the study show that the effectiveness of chemical castration sanctions is still in doubt and has the potential to contradict the principle of non-discrimination in the 1945 Constitution, ICCPR, and other international human rights instruments. **Implications:** Chemical castration policies create a dilemma between the protection of communities from sexual crimes and the protection of the human rights of perpetrators, as well as the debate from an Islamic perspective of Islam and the SDGs related to health, justice, and welfare. **Novelty:** The novelty of this research lies in the integrative analysis of chemical castration sanctions from the perspective of criminal law, human rights, Islamic law (maqasid al-shariah), and SDGs.

Keywords: child sexual crimes, digital legal sanctions, online child protection, islamic law, sdgs.

INTRODUCTION

The phenomenon of sexual violence against children in Indonesia has reached alarming levels and caused deep social anxiety. One of the cases that became a turning point of public attention was the rape and murder case of Yuyun, a junior high school student in Bengkulu in 2016, which was carried out sadistically by a group of underage perpetrators. The case caused public outrage and prompted the government to issue Government Regulation in Lieu of Law (Perppu) Number 1 of 2016 concerning the Second Amendment to Law Number 23 of 2002 concerning Child Protection, which was later

stipulated as Law Number 17 of 2016. One of the most controversial provisions in this regulation is the imposition of chemical castration sanctions for perpetrators of sexual violence against children, which is seen as an extreme attempt to create a deterrent effect and protect victims in the future [1].

Although enforced in the spirit of child protection, the implementation of chemical castration sanctions has caused serious debate from the aspects of criminal law and human rights. Juridically, as stipulated in Article 81A paragraph (1), chemical castration is categorized as an additional penalty that can be imposed on the perpetrator of sexual violence to control the sexual urge of the perpetrator after serving the main sentence. However, various circles consider that the application of these sanctions has the potential to violate human rights, especially the right to bodily integrity, the right to be free from torture, and the principle of non-discrimination guaranteed by the Constitution of the Republic of Indonesia in 1945, Law Number 39 of 1999 concerning Human Rights, and various international instruments such as *Universal Declaration of Human Rights* (UDHR) and *International Covenant on Civil and Political Rights* (ICCPR) [2].

Empirically, data show that sexual violence against children is still on the rise despite increased legal sanctions. Based on a report by the National Commission on Anti-Violence against Women (Komnas Perempuan) in 2023, there were more than 20,000 cases of sexual violence reported, with 45% of them involving children as victims [3]. Similar data was also issued by the Ministry of Women's Empowerment and Child Protection (KemenPPPA) through the Online Information System for the Protection of Women and Children (SIMFONI-PPA), which shows an increasing trend in cases of sexual exploitation and violence in the domestic and public spheres [4]. This fact raises a fundamental question: the extent to which chemical castration sanctions are effective in reducing the rate of sexual violence against children, and whether these forms of punishment are in line with the principles of modern criminal law that are oriented towards justice and humanity.

In criminal law theory, the effectiveness of a sanction is not only measured by the severity of the punishment, but also by the ability of the punishment to achieve the goal of the punishment (*theories of punishment*), which are retributive, deterrent, and reformative [5]. Chemical castration sanctions, although intended as a preventive and repressive effort, are often considered not to meet the reformative aspect because they emphasize more physical suffering than moral improvement or rehabilitation of the perpetrators. This creates a contradiction with the concept of fair punishment, as described by Barda Nawawi Arief, that criminal law must balance the interests of the state, victims, and perpetrators, without eliminating the human dignity of the perpetrators.

From a human rights perspective, chemical castration sanctions also pose normative problems because they touch the line between legal punishment and prohibited torture. The principle of non-discrimination, as stated in Article 28I paragraph (2) of the 1945 Constitution, guarantees that everyone has the right to be free from discriminatory treatment on any basis and has the right to be protected from such treatment [6]. In addition, Article 7 of the ICCPR expressly prohibits torture or treatment that is cruel, inhumane, or degrading to human dignity, without exception [7]. So, when the state imposes chemical castration sanctions that have implications for changes in the biological function of a person's body, the question arises whether the action is a form of lawful punishment or a form of inhuman treatment.

This controversy is even more complex when it is linked to the principle of *equality before the law* in the context of criminal execution in Indonesia. Not all perpetrators of sexual violence are subjected to chemical castration; This sanction is only imposed in certain cases that meet certain criteria according to the policy of law enforcement officials [8]. This gives the impression that there is discrimination in the application of the law,

both between perpetrators and in the gender dimension, because most of the perpetrators sentenced are men, while female perpetrators of sexual violence do not receive the same treatment [9]. In fact, the principle of non-discrimination demands equal treatment before the law regardless of gender, race, or social background.

In addition, in terms of implementation, the effectiveness of chemical castration is also still questionable. Some regions, such as East Java and South Sulawesi, have faced obstacles in the implementation of this punishment due to the unavailability of medical personnel who are willing to do so on the basis of ethical considerations of the medical profession [10]. The Indonesian Doctors Association even expressly stated its rejection of the involvement of doctors in the chemical castration process, arguing that the action is contrary to the Indonesian Medical Code of Ethics, which requires doctors to respect the integrity of the human body [11]. As a result, some court decisions that have imposed chemical castration sanctions cannot be executed, so the effectiveness of these punishments becomes pseudo and creates legal uncertainty.

This condition shows the dualism of legal problems: on the one hand, the state has an obligation to provide maximum protection for children as victims of sexual violence; On the other hand, the state is also bound by human rights principles that guarantee humane treatment of perpetrators. The tension between the effectiveness of chemical castration sanctions and the principle of non-discrimination raises both conceptual and practical problems in Indonesian criminal law. At the conceptual level, the question arises whether chemical castration is a form of criminal sanction in accordance with the principles of justice and humanity; On the practical level, however, there are doubts as to whether its implementation can be carried out without violating universally recognized human rights principles.

In addition to the issue of effectiveness and human rights violations, chemical castration sanctions also raise philosophical debates in modern criminal law, especially regarding the nature of the punishment itself. In classical thought, such as that put forward by Immanuel Kant and Hegel, punishment is seen as a legitimate form of retribution (retribution theory), in which the perpetrator must bear the consequences of his actions as moral and legal consequences [12]. However, in the development of modern criminal law, the paradigm began to shift towards the humanization of criminal law, which is to place criminalization as a means to improve the behavior of perpetrators and restore social order, not just to avenge crime [13].

The policy of chemical castration sanctions that cause permanent physical suffering is considered contrary to the spirit of this humanization. From the perspective of criminal law philosophy, the purpose of law is not only to punish, but also to uphold human values and substantive justice [14]. Therefore, when the state uses criminal mechanisms that have the potential to violate human rights, the moral legitimacy of the law itself is questionable. As Gustav Radbruch stated, "a law that loses justice is that it loses its nature as a law" [15]. The conflict between effectiveness and human rights can also be seen through the general principles of criminal law that apply in Indonesia. One of them is the principle of humanity and the principle of justice, which are the basis of the national penal system as reflected in Article 5 paragraph (1) of the Criminal Code Bill 2023, which states that criminalization is not intended to degrade human dignity [16]. In the context of chemical castration, this principle seems difficult to maintain, because this form of punishment is actually a body-invasive punishment, a punishment that directly attacks a person's biological integrity.

In terms of legal practice, the implementation of chemical castration in Indonesia also faces inconsistencies in implementation. For example, in the case of Mojokerto in 2019, the court imposed an additional penalty of chemical castration on perpetrators of sexual violence against children. However, until 2023, the criminal

execution was delayed due to the absence of medical personnel willing to carry out the act, and the absence of a clear technical mechanism in Government Regulation Number 70 of 2020 concerning Procedures for the Implementation of Chemical Castration Acts [17]. This shows that criminal law policies that are not supported by legal infrastructure and professional ethics can cause the law to lose its usefulness (*Law in Action Gap*). In addition, the inconsistency in the application of chemical castration also causes potential violations of the principle of equality before the law guaranteed in Article 27, paragraph (1) of the 1945 Constitution. In some court rulings, chemical castration is imposed on perpetrators who commit sexual violence against girls, but it is not applied to similar cases involving male victims [18]. This unequal treatment gives the impression that the law still views victims of sexual violence discriminatorily based on gender, even though the principle of legal protection of children should be universal regardless of the sex of the victim.

Within the framework of international human rights law, Indonesia, as a state party to the ICCPR, has an obligation to adapt national law to be in line with the principles of the convention. Article 7 of the ICCPR expressly prohibits torture or inhuman treatment, without exception, even against the perpetrators of serious crimes [19]. However, chemical castration policies have the potential to be categorized as "cruel, inhuman or degrading treatment" as interpreted by the Human Rights Committee in General Comment No. 20 (1992) [20]. The UN Human Rights Committee affirms that punishment that causes long-term physical suffering, even on law enforcement grounds, is still considered a violation of Article 7 of the ICCPR.

In the national context, these principles are strengthened through Article 28G paragraph (2) and Article 28I paragraph (1) of the 1945 Constitution, which guarantee the right of everyone to be free from torture and treatment that degrades human dignity [21]. This means that chemical castration policies that directly affect the human body without consent can be seen as contrary to the Constitution. Therefore, an important question arises in constitutional law: to what extent can criminal policies be enforced if they have the potential to violate the constitutional rights of citizens? This contradiction confirms that the problem of chemical castration is not solely related to the effectiveness of criminal law, but also to the conflict of norms between national law and international law. On the one hand, the state is obliged to protect children from sexual violence as a form of fulfilling the right to a sense of security; On the other hand, the state is also bound to respect the basic rights of perpetrators so as not to experience inhumane treatment [22]. This dilemma illustrates the classic tension between two legal goals: legal certainty and substantive justice.

Based on these things, it can be concluded that the debate on chemical castration sanctions is not only a technical issue of implementation, but also concerns the basic philosophy of criminality and human rights. The existence of chemical castration as an additional crime contains the potential for overcriminalization, which is a condition when the state uses its criminal power excessively to exceed the moral limits of the law [23]. Thus, this study becomes very relevant to examine how Indonesian law can balance the need to uphold justice for victims of sexual violence and the obligation to maintain the principles of non-discrimination and the protection of human dignity.

Based on the description above, this study is important to conduct an in-depth analysis of the contradiction between the effectiveness of chemical castration sanctions and the principle of non-discrimination from the perspective of criminal law and human rights. This study is expected to make a theoretical contribution to the development of legal science, especially in finding a balance between the interests of law enforcement and respect for human rights, as well as providing practical input for policymakers so that

criminal sanctions in Indonesia are not only repressive but also humane, proportional, and in accordance with social justice values [24].

LITERATURE REVIEW

Several studies on the effectiveness of castration and non-discrimination penalties in criminal law and human rights will contribute to the major agenda that has been agreed upon by United Nations (UN) member states in the *Sustainable Development Goals* (SDGs), oriented towards the Sustainable Development Goals. Legal effectiveness is part of the representation of SDG 16, which involves the enforcement of justice and legal transparency related to castration sanctions in criminal law. The first study is on *Implementing Chemical Castration Punishment: A Perspective on Criminal Law and Human Rights*. The research examines in depth the application of chemical criminal sanctions law from the perspective of criminal law and human rights. The results of the study show that the emphasis is on government policies to prevent child abuse and implement criminal law functions in the form of retribution, rehabilitation, and deterrence [25].

Second, about the *Application of Chemical Castal Sanctions for Perpetrators of Child Sexual Violence from the Perspective of Human Rights*. The study shows that the application of criminal sanctions for chemical castration has the potential to be contrary to the principle of *Non-degrading* treatment in international conventions that have been ratified in Indonesia. The discussion of the study resulted in the application of criminal sanctions for chemical castration, which can be maintained with the record of medical approval, strict supervision, and emphasis on policy reform by emphasizing rehabilitation of perpetrators and public education [26].

Third, the strategy to realize peace through international law for sustainable development. The research focuses on sociological legal studies to answer societal problems in order to realize SDG 16 related to national and international peace. The Sustainable Development Goals or SDG 16 emphasize the inclusiveness of a peaceful society and aim to provide access to justice for all parties effectively. So that the law must involve the community in obtaining access to justice at all levels of society [27].

METHODOLOGY

This research employs a normative juridical method with a legislative approach and case analysis to examine the effectiveness of chemical castration sanctions and their compatibility with the principle of non-discrimination. The normative juridical approach is used to analyze legal norms, principles, and doctrines governing criminal sanctions, human rights protection, and their application within the existing legal system. The legislative approach focuses on reviewing relevant laws and regulations, including provisions related to criminal law, child protection, and human rights instruments at both national and international levels. Meanwhile, the case approach is conducted by examining selected court decisions to understand how chemical castration sanctions are interpreted and implemented in practice.

The data utilized in this study consists of primary and secondary legal materials. Primary data is obtained through the study of statutory regulations, including the 1945 Constitution, criminal law provisions, and international human rights instruments such as the ICCPR. Secondary data includes court decisions, legal journals, scholarly articles, and reports from law enforcement agencies that provide contextual and analytical insights into the issue. Data collection is conducted through an extensive literature study by identifying, reviewing, and systematically organizing relevant legal sources.

Furthermore, this research integrates an SDGs-oriented analytical framework, particularly focusing on SDG 3 (Good Health and Well-being), SDG 10 (Reduced Inequalities), and SDG 16 (Peace, Justice, and Strong Institutions). These indicators are used to assess whether the implementation of chemical castration sanctions aligns with global commitments to human rights, justice, and public health. Data analysis is carried out qualitatively by interpreting legal materials through a systematic and critical approach. This method enables the researcher to evaluate the consistency between legal norms, judicial practices, Islamic legal perspectives (*maqasid al-shariah*), and SDGs principles in order to formulate comprehensive and balanced conclusions.

RESULTS AND DISCUSSION

Effectiveness of Chemical Castration Sanctions for Sexual Violence Offenders

The effectiveness of the implementation of chemical castration sanctions in the Indonesian criminal law system needs to be comprehensively analyzed by considering various aspects, ranging from the philosophical foundation of punishment, implementation mechanisms, to concrete impacts on crime prevention. Chemical castration sanctions are regulated in Article 81 paragraph (7) and Article 82 paragraph (3) of Law Number 17 of 2016 as additional sanctions that can be imposed on perpetrators of sexual violence against children [28]. From a criminal law perspective, the effectiveness of a sanction is measured by its ability to achieve the goal of the penalty, which is to provide a deterrent effect to the perpetrator (*Special Deterrence*), prevent other communities from committing similar crimes (*General Deterrence*), rehabilitate perpetrators, and protect the community from the dangers of crime [29]. However, the implementation of chemical castration sanctions in Indonesia faces various fundamental obstacles that question its effectiveness as a criminal law instrument.

From the perspective of criminal theory, chemical castration sanctions can be categorized as a combination of retributive theory and utilitarian theory. Retributive theory views punishment as a commensurate retribution for the evil deeds committed by the perpetrator, so that the punishment must be proportional to the level of seriousness of the crime [30]. Sexual violence against children is seen as an extraordinary crime that permanently damages the future of the victim, so it requires harsh sanctions. On the other hand, utilitarian theory emphasizes that the goal of punishment is to prevent future crimes through deterrent and rehabilitation effects. Chemical castration is theoretically designed to reduce the sexual drive of the perpetrator through a decrease in testosterone levels, so it is expected to prevent recidivism or the repetition of crimes. However, the integration of these two theories in the practice of chemical castration raises fundamental problems related to the proportionality and humanity of sanctions.

The mechanism of chemical castration is carried out through the injection of anti-androgen drugs such as Cyproterone Acetate or Medroxyprogesterone Acetate, which function to suppress the production of testosterone hormone in the male body. This process must be done regularly and requires close medical supervision because the drugs have significant side effects, including osteoporosis, cardiovascular disorders, diabetes, depression, and impaired liver function. Article 81 paragraph (8) of Law Number 17 of 2016 mandates that further provisions regarding the procedures for the implementation of chemical castration actions are regulated by Government Regulation. Government Regulation Number 70 of 2020 concerning Procedures for the Implementation of Chemical Castration Acts, Installation of Electronic Detection Devices, Rehabilitation, and Announcement of the Identity of Perpetrators of Sexual Violence Against Children was then issued to regulate the technical mechanism [31]. However, until now, there has not been a single case where chemical castration sanctions have actually been implemented in Indonesia, even though the regulations have been in place since 2016.

The absence of concrete implementation of chemical castration sanctions indicates that there are fundamental structural obstacles in the Indonesian criminal law system. First, in terms of medical infrastructure, Indonesia does not have adequate and evenly distributed health facilities to carry out chemical castration procedures and long-term medical supervision. Chemical castration is not just a one-time injection, but requires an ongoing program with strict monitoring of the health condition of the perpetrator for many years. The Ministry of Health of the Republic of Indonesia has not prepared special infrastructure for this purpose, both in terms of referral hospitals, the availability of medicines, and trained medical personnel. Second, there is resistance from the medical profession, especially the Indonesian Doctors Association (IDI), which refuses to carry out chemical castration because the action is contrary to medical ethics and the Indonesian Medical Code of Ethics (KODEKI) [32]. Doctors have an obligation not to harm the patient (*primum non nocere*), while chemical castration is intended to have a deliberate negative effect on a person's biological function. This ethical dilemma creates an executive vacuum because, without the involvement of doctors, chemical castration sanctions cannot be implemented.

From a criminological perspective, the effectiveness of chemical castration as a means of preventing sexual crimes is also questionable. Criminological research shows that sexual violence against children is not solely driven by biological sexual desire, but rather is a complex phenomenon involving psychological, social, and power factors. Many perpetrators of sexual violence are motivated by a desire to dominate and control the victim, not solely for sexual gratification. Therefore, suppressing the hormone testosterone through chemical castration does not necessarily eliminate the motive for the crime, since the perpetrator can still commit sexual violence in other ways that do not require an erection or penetration. A study from South Korea, one of the countries that has implemented chemical castration since 2011, shows that the success rate of this program is highly dependent on a combination of intensive psychological therapy and a strict supervision system [33]. Without a comprehensive psychological rehabilitation program, chemical castration only addresses symptoms without touching the root cause of the criminal behavior problem.

The financing aspect is also a significant obstacle to the effectiveness of the implementation of chemical castration sanctions. The cost of procurement of anti-androgen drugs, periodic medical examinations, and long-term surveillance requires a large budget. Government Regulation Number 70 of 2020 states that the cost of implementing chemical castration actions is charged to the State Revenue and Expenditure Budget (APBN). However, until now, there has been no clear and adequate budget allocation for this purpose. In a situation where the national health budget is still limited and prioritized for basic health programs, the allocation of funds for chemical castration that has not been proven effective is a question of the cost-benefit ratio of this policy.

In terms of legal certainty, Article 81 paragraph (7) of Law Number 17 of 2016 uses the phrase "may be subject to action," which shows a facultative nature, not imperative. This means that the judge has the discretion to impose or not impose chemical castration sanctions, even for perpetrators who meet the qualifications. This facultative nature creates legal uncertainty because there are no clear objective parameters as to when and under what conditions chemical castration sanctions should be imposed. In judicial practice, judges tend to be conservative and choose not to impose chemical castration sanctions due to a variety of considerations, including the lack of implementation infrastructure and the accompanying human rights controversies [34]. This condition makes chemical castration sanctions a "paper tiger" that exists in regulations but has never been implemented, so that the general deterrence function becomes nil.

Comparisons with other countries that have implemented chemical castration provide an important perspective on the factors that determine the effectiveness of these sanctions. In South Korea, chemical castration is implemented with a very strict system, including in-depth psychiatric evaluations, special committee approvals, and comprehensive rehabilitation programs. However, its implementation still draws criticism from human rights activists and medical organizations. In some states, such as California, chemical castration is mandatory for repeat offenders of sexual violence against children, but its implementation also faces ongoing legal and ethical challenges [35]. Meta-analysis studies showed that chemical castration had varying levels of effectiveness, with recidivism rates decreasing in offenders who underwent the program consistently and in combination with psychological therapy, but the effectiveness decreased dramatically when the offender stopped taking the drug or did not receive adequate supervision.

In the context of Indonesian criminal law, which adheres to a double-track system by distinguishing between punishment and treatment, chemical castration is categorized as an act. Actions in criminal law aim at rehabilitation and prevention, not retaliation. However, the fact that chemical castration is imposed as a consequence of crimes committed and committed without the consent of the perpetrator creates ambiguity as to whether this is really a rehabilitative act or a disguised criminal one. The Constitutional Court, in its various rulings, has affirmed that any sanction that restricts a person's fundamental rights must meet the principle of proportionality and must not be arbitrary [36]. Chemical castration that forcibly intervenes in the biological functions of the human body has the potential to violate this principle of proportionality, especially if it is not supported by strong empirical evidence regarding its effectiveness.

Based on the multidimensional analysis above, it can be concluded that the effectiveness of chemical castration sanctions from the perspective of Indonesian criminal law is still very doubtful. The absence of concrete implementation since the regulation was enacted in 2016, structural obstacles in the form of the absence of medical infrastructure and resistance from the medical profession, limited criminological understanding of the root causes of sexual violence, financing constraints, and legal uncertainty due to the facultative nature of these sanctions, all contribute to the ineffectiveness of chemical castration as an instrument of criminal law enforcement. Chemical castration sanctions appear to be more of a symbolic response to public demands for harsh punishment of child sexual abuse perpetrators, rather than a measurable and effective solution to prevent crime. Without fundamental improvements to the implementation system, supporting infrastructure, and integration with comprehensive rehabilitation programs, chemical castration sanctions will remain unimplemented regulations and fail to achieve the expected penal goals.

The Conflict Between Chemical Castration Sanctions

The principle of non-discrimination is one of the fundamental pillars of the international human rights legal system and the Indonesian constitution that guarantees that everyone is entitled to equal treatment before the law without discrimination based on race, gender, religion, or other personal characteristics. Article 28I paragraph (2) of the 1945 Constitution of the Republic of Indonesia explicitly states that "Everyone has the right to be free from discriminatory treatment on any basis and has the right to be protected from discriminatory treatment. Similar provisions are also guaranteed in Article 2 paragraph (1) of the International Covenant on Civil and Political Rights (ICCPR) which has been ratified by Indonesia through Law Number 12 of 2005, which states that States parties undertake to respect and guarantee the rights recognized in the covenant without discrimination in any form such as race, color, sex, language, religion, or other status [37]. In this context, the chemical castration sanctions regulated in Law Number 17 of 2016 pose a fundamental contradiction with the principle of non-discrimination

because they can inherently only be applied to male offenders, creating a disparity in treatment based on gender for identical crimes.

The fundamental contradiction between chemical castration sanctions and the principle of non-discrimination lies in the biological characteristics of the sanctions, which can only be imposed on male offenders. The mechanism of chemical castration works by suppressing the production of the hormone testosterone through the administration of anti-androgen drugs, so that medically and biologically it cannot be applied to female actors who do not have testosterone in significant levels [38]. In fact, sexual violence against children is not only perpetrated by male perpetrators, although statistically, the majority of perpetrators are also men. Data from various criminological studies show that there are cases of sexual violence against children committed by female perpetrators, both as single perpetrators and perpetrators together with men. In a situation where two people of different sexes commit a crime of sexual violence against a child with the same modus operandi and level of seriousness, the male perpetrator can be threatened with chemical castration, while the female perpetrator cannot be subjected to the same sanction. This condition creates differential treatment based on gender, which is a form of discrimination in the criminal law system.

From the perspective of criminal law theory, the principle of equality before the law requires that everyone who commits the same criminal act should be threatened with equal sanctions without distinction based on personal characteristics that are not relevant to the criminal act. The principle of legality contained in Article 1 paragraph (1) of the Criminal Code (KUHP) also contains the implication that criminal law must be applied definitively and equally to everyone [39]. When criminal sanctions or actions can only be imposed on certain groups based on gender, not based on the quality of the act or the degree of wrongdoing of the perpetrator, there is a violation of the principle of substantive justice in criminal law. The sex of the perpetrator is not a relevant factor to the elements of the crime of sexual violence against children, so it should not be the basis for discrimination in the imposition of sanctions.

The United Nations Human Rights Committee (UN) in its General Comment No. 18 on non-discrimination has given an authoritative interpretation that discrimination means any distinction, exclusion, restriction or preference based on personal characteristics such as race, color, sex, language, religion, or other status, which has the purpose or effect of negates or reduces the recognition, enjoyment of, or the exercise of human rights and fundamental freedoms based on equality. Furthermore, the Committee affirms that not all differences in treatment constitute discrimination, as long as the criteria for such discrimination are reasonable and objective, and the aim is to achieve a legitimate purpose under the covenant. In the context of chemical castration sanctions, discrimination based on sex does not meet the "reasonable and objective" criteria because the sex of the perpetrator has no relevance to the purpose of the crime, which is to provide a deterrent effect, rehabilitate the perpetrator, and protect the community. Instead, this distinction is based solely on biological limitations in the implementation of sanctions, which suggests that the design of sanctions itself was discriminatory from the start.

The argument that is often put forward to justify chemical castration sanctions is that this difference in treatment is a consequence of objective biological differences between males and females, so it does not constitute discrimination. However, this argument is unacceptable from the perspective of modern human rights law. The Convention on the Elimination of All Forms of Discrimination against Women (CEDAW), which Indonesia has ratified through Law No. 7 of 1984, expressly prohibits all forms of discrimination based on sex, including different treatment based on stereotypes or assumptions about the biological roles and characteristics of men and women [40]. In fact, sexual violence is an act that can be committed by anyone regardless of gender, and the traumatic impact on the victim does not differ based on the sex of the perpetrator. Therefore, biological

differences cannot be used as a justification for imposing sanctions that can only be imposed on one particular sex.

The Constitutional Court of the Republic of Indonesia, in its various decisions, has developed the doctrine regarding the test of the constitutionality of a potentially discriminatory legal norm. In Decision No. 22/PUU-XV/2017 concerning the Testing of the Population Administration Law, the Constitutional Court emphasized that any restriction on the constitutional rights of citizens must meet the principle of proportionality and must not be arbitrary. Furthermore, the Constitutional Court has also stated that Article 28I paragraph (2) of the 1945 Constitution is a provision that cannot be reduced under any circumstances (non-derogable rights), so the state has an absolute obligation to ensure that every citizen is free from discrimination [41]. In this context, although the Constitutional Court has never examined the constitutionality of chemical castration sanctions specifically, based on the principles that have been developed in its rulings, there is a strong argument that chemical castration sanctions have the potential to be contrary to Article 28I paragraph (2) of the 1945 Constitution.

The conflict between chemical castration sanctions and the principle of non-discrimination can also be seen from the perspective of Article 7 of the ICCPR, which prohibits torture or other cruel, inhuman, or degrading treatment or punishment. The UN Human Rights Committee in General Comment No. 20 on Article 7 of the ICCPR states that the prohibition of torture and inhuman treatment applies without discrimination and cannot be reduced under any circumstances. Chemical castration sanctions that forcibly intervene with the biological functions and integrity of a person's body can be categorized as inhumane treatment, and when these sanctions can only be applied to one sex, there is a double discrimination: discrimination in the application of sanctions and discrimination in the form of inhumane treatment. International human rights organizations such as Amnesty International and Human Rights Watch have expressed objections to the practice of chemical castration, arguing that these sanctions violate the principles of human dignity and the right to physical integrity, and are potentially discriminatory.

In the context of Indonesian national law, Law Number 39 of 1999 concerning Human Rights comprehensively regulates the prohibition of discrimination. Article 1 paragraph (3) of this law defines discrimination as any restriction, harassment, or exclusion that is directly or indirectly based on discrimination against people based on religion, ethnicity, race, ethnicity, group, class, social status, economic status, gender, language, political beliefs, which results in the reduction, deviation or elimination of the recognition, exercise or use of human rights and basic freedoms in life, both individually and collectively in the fields of politics, economics, law, social, culture, and other aspects of life [42]. Article 3, paragraph (3) of the same law also affirms that everyone has the right to the protection of human rights and basic human freedoms, without discrimination. Chemical castration sanctions, which can only be structurally applied to male perpetrators, are clearly a form of discrimination based on sex in the field of law, especially criminal law, which is contrary to the provisions of this Human Rights Law.

Another argument to consider is that chemical castration sanctions can be viewed as a form of positive discrimination (*affirmative action*) or special treatment that is justified to protect children as a vulnerable group. However, this argument is also unacceptable because the concept of positive discrimination in international human rights law can only be justified when it is aimed at protecting or advancing historically marginalized or disadvantaged groups, and such special treatment is temporary until substantive equality is achieved [43]. Chemical castration sanctions are not a measure to protect marginalized groups, but rather criminal sanctions imposed on criminals. Furthermore, there is no justification within the human rights legal framework that justifies the discriminatory application of invasive sanctions on a person's bodily integrity based on sex, even in the context of serious crimes.

The National Human Rights Commission (Komnas HAM) of the Republic of Indonesia, in its view on Perppu Number 1 of 2016, has stated that chemical castration sanctions have the potential to violate the human rights of perpetrators, including the right to be free from torture and inhuman treatment, as well as the principle of non-discrimination. Komnas HAM emphasized that although the state has an obligation to protect children from sexual violence, the measures taken must not violate fundamental human rights, including the rights of perpetrators. The principle of proportionality in human rights law requires that any restriction on human rights must meet certain conditions, that is, it is based on the law, necessary in a democratic society, and proportionate to a legitimate purpose. Chemical castration sanctions that are discriminatory based on sex fail to meet this proportionality requirement because they create injustice in the criminal justice system.

From a philosophical perspective of law, the principle of justice according to John Rawls requires that the legal system must treat everyone equally and must not create privilege or disadvantage based on personal characteristics that the individual does not choose. Gender is a biological characteristic that a person does not choose, so it cannot be used as a basis for differentiating treatment in the criminal justice system. Ronald Dworkin also emphasized that everyone has the right to be treated with equal concern and respect by the law and the government. When the legal system creates inherently discriminatory sanctions, this principle of equal respect is violated. Chemical castration sanctions not only fail to achieve the goal of criminalization effectively, but also injure the basic principles of justice and equality that are the foundation of a democratic state of law.

Table 1. Legal Framework and Controversies of Chemical Castration Sanctions

Legal Basis	Law No. 17 of 2016 concerning Child Protection
Criminal Intent	Deterrence (deterrence effect) that is oriented to the perpetrator specifically and provides a deterrent effect to the wider community in general
Imposition of Sanctions	Legal sanctions in the form of additional criminal penalties that already have permanent legal force <i>in kracht</i> , and there is a medical assessment.
Legal controversy	Contrary to the principle of <i>non-degradable rights</i> , chemical castration violates human <i>dignity</i> .

Based on the comprehensive analysis above, it can be concluded that chemical castration sanctions as stipulated in Law Number 17 of 2016 are fundamentally contrary to the principle of non-discrimination guaranteed in Article 28I paragraph (2) of the 1945 Constitution, Article 2 of the ICCPR, and various other international human rights legal instruments. This conflict is structural and inherent, not just a technical issue of implementation, because these sanctions can only be applied to male offenders, creating gender-based disparities in the treatment of identical crimes. There is no acceptable justification within the modern human rights legal framework to justify this form of discrimination, even under the pretext of child protection or crime prevention. Therefore, a thorough evaluation of the chemical castration sanctions policy is a must, considering sanctions alternatives that are more effective and in line with fundamental human rights principles, in particular the principles of non-discrimination and respect for human dignity.

Castration Sanctions in Islamic Criminal Law: Maqasid Shariah and SDGs

Islamic crimes (*jarimah*) can be divided into three, namely *Hudud*, *qishas*, and *ta'zir*. *Hudud jarimah* and *qishas* are *jarimah* that have been determined in the *Qur'an* and *hadith*

[44]. As for jarimah ta'zir, it is a jarimah whose punishment has no clear nash in the Qur'ân and Al-Hadith, so it must be determined by the government or waliyul amri by means of ijtihad. All the provisions are returned to them to impose sanctions or punishment on the perpetrators of crimes who are subject to the punishment of ta'zîr. Punishment in the form of chemical castration is categorized in jarimah ta'zir because it does not have an explicit basis in nash, both the Qur'an and the hadith. Therefore, the weight of the punishment is completely left to the ulil amri (ruler) to achieve the benefits that are the core purpose of Islamic law, namely, to achieve benefits and eliminate damage. So that the punishment of corruption can have a deterrent effect and protect the community. Although ta'zir provides a wide discretion space for the ruler, it does not mean that its implementation is unlimited. The scholars of fiqh stipulate that the punishment of ta'zir should not violate the basic principles of Islamic shari'at. In this context, ta'zir in the form of castration that has the potential to permanently damage the body must be applied carefully. Physical castration in the form of chemical injections in the testicles is generally not allowed by Islamic shari'a as a punishment [45].

Some scholars allow hukuman ta'zir in the form of castration for very serious recidivists. However, some other scholars forbid castration because it has an impact on physical changes and can even damage the integration of God's creation. However, when viewed in the principles of maqasidu Shari'ah, it shows that there has been a conflict between the principles of maqasidu Shari'ah. On the one hand, castration policy is based on the main maqasidu shari'ah, namely religion (Hifz al-Din), soul (Hifz al-Nafs), intellect (Hifz al-'Aql), heredity (Hifz al-Nasl), and property (Hifz al-Mal) [46]. The castration policy is based on hifzul nafsi (soul/salvation). However, castration has the potential to have a detrimental impact on the physical and mental perpetrator.

Table 2. Islamic and SDGs Perspectives on Castration Sanctions and Justice

Analytical Perspective	Explanation
Islamic Perspective and the SDGs	In the Islamic perspective, there is a conflict of interest between the principles of maqasidu Shari'ah, namely the protection of the individual soul (perpetrator) and the protection of the soul (collective). The application of castration sanctions, when viewed from the perspective of <i>the Sustainable Development Goals</i> (SDGs), on the one hand, this policy is often associated with efforts to achieve SDG 16 (<i>Peace, Justice and Strong Institutions</i>) through the prevention of sexual crimes that threaten security and justice for victims, especially children. But on the other hand, the application of castration sanctions raises serious debates related to SDG 3 (<i>Good Health and Well-Being</i>) and SDG 10 (<i>Reduced Inequalities</i>), because it has the potential to cause medical, psychological, and inhumane treatment of perpetrators.

The conflict of interest between the principles of maqasidu Shari'ah is the protection of the individual soul (perpetrator) and the protection of the soul (collective). The application of castration sanctions from the perspective of *the Sustainable Development Goals* (SDGs) needs to be studied comprehensively by balancing the purpose of community protection and respect for human rights. On the one hand, this policy is often associated with efforts to achieve SDG 16 (*Peace, Justice and Strong Institutions*) through the prevention of sexual crimes that threaten security and justice for victims, especially children. But on the other hand, the application of castration sanctions raises serious debates related to SDG 3 (*Good Health and Well-Being*) and SDG 10 (*Reduced Inequalities*), because it has the potential to cause medical, psychological, and inhumane treatment of perpetrators. Therefore, within the framework of the SDGs, castration sanctions policies should not only be oriented towards the deterrent effect, but also

consider the principles of restorative justice, rehabilitation of perpetrators, recovery of victims, and law enforcement that uphold human dignity and the principles of sustainability of social justice.

CONCLUSION

First, the effectiveness of the application of chemical castration sanctions against perpetrators of sexual violence from the perspective of Indonesian criminal law is still very doubtful and has not been proven to achieve the expected penal goals. The absence of concrete implementation since the regulation was enacted in 2016 indicates the existence of fundamental structural barriers, including the limitations of medical infrastructure, resistance from the medical profession who refuse to carry out chemical castration because it is contrary to medical ethics, the limited criminological understanding that sexual violence is not solely driven by biological sexual desire but psychological and power factors, significant financing constraints, and legal uncertainty due to the facultative nature of these sanctions that give full discretion to judges without clear objective parameters. From the perspective of criminal theory, chemical castration sanctions fail to effectively integrate retributive and utilitarian theories because they are not supported by an adequate implementation system and comprehensive psychological rehabilitation programs. Comparative studies with other countries, such as South Korea and several states in the United States, show that the success of chemical castration is highly dependent on the availability of comprehensive supporting infrastructure, ongoing medical supervision, and integration with intensive psychological therapy, all of which are not yet available in Indonesia. Therefore, chemical castration sanctions in the Indonesian context are more of a symbolic response to public demands for harsh punishment for perpetrators of child sexual violence, rather than a measurable and effective solution to prevent crime and protect society from the dangers of recidivism. Second, chemical castration sanctions as stipulated in Law Number 17 of 2016 are fundamentally contrary to the principle of non-discrimination guaranteed in Article 28I paragraph (2) of the 1945 Constitution, Article 2 paragraph (1) of the International Covenant on Civil and Political Rights (ICCPR), as well as various other international human rights legal instruments that have been ratified by Indonesia. This conflict is structural and inherent because chemical castration sanctions are biologically and medically applicable only to male offenders through a decrease in testosterone levels, while female offenders who commit identical crimes cannot be subject to the same sanctions. This condition creates a disparity in treatment based on sex that violates the principle of equality before the law and the principle of non-discrimination, because the sex of the perpetrator is not a relevant factor to the elements of the crime of sexual violence against children or the level of guilt of the perpetrator. The UN Human Rights Committee's interpretation in General Comment No. 18 asserts that any differentiation of treatment based on sex must meet the criteria of "reasonable and objective" and have a legitimate purpose, but chemical castration sanctions fail to meet this criterion because the distinction is based solely on biological limitations in the implementation of the sanctions, not on the legitimate purpose of the penalty. The argument that biological differences can justify discrimination is unacceptable within the framework of modern human rights law, as affirmed in the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), which prohibits all forms of discrimination based on sex. Furthermore, chemical castration sanctions also have the potential to violate Article 7 of the ICCPR on the prohibition of torture and inhuman treatment, as they forcibly intervene in the integrity of a person's body and biological functions, and when these sanctions can only be applied to one gender, there is double discrimination in the application of sanctions and in the form of inhumane treatment. Third, from the perspective of Islam and the SDGs, the application of chemical castration sanctions has a conflict of interest between the principles of maqasidu Shari'ah, namely the protection of the individual (perpetrator) and the protection of the soul (collective). The application of castration

sanctions is also seen from the perspective of the Sustainable Development Goals (SDGs). On the one hand, this policy is often associated with efforts to achieve SDG 16 (*Peace, Justice and Strong Institutions*) through the prevention of sexual crimes that threaten security and justice for victims, especially children. But on the other hand, the application of castration sanctions raises serious debates related to SDG 3 (*Good Health and Well-Being*) and SDG 10 (*Reduced Inequalities*), because it has the potential to cause medical, psychological, and inhumane treatment of perpetrators.

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Author Contribution

The author contributes fully to the main contributors to this paper. The author has read and approved the final paper.

Conflicts of Interest

The author declares no conflicts of interest regarding this publication. This research was conducted independently in accordance with ethical standards. All findings and conclusions presented are solely the responsibility of the author.

REFERENCES

- [1] A. Marddent, "Religious discourse and gender security in Southern Thailand," *Austrian J. South-East Asian Stud.*, vol. 12, no. 2, pp. 225–247, 2019, <https://doi.org/10.14764/10.ASEAS-0023>.
- [2] A. K. Syafa'at, "Potensi Zakat, Infaq, Shodaqoh Pada Badan Amil Zakat Nasional (BAZNAS) Di Kabupaten Banyuwangi Abdul," *J. Chem. Inf. Model.*, vol. 53, no. 9, pp. 1689–1699, 2013, <https://doi.org/10.1017/CBO9781107415324.004>.
- [3] N. Nasrullah, "Implementing Chemical Castration Punishment: A Perspective on Criminal Law and Human Rights," *SIGN J. Huk.*, vol. 4, no. 2, pp. 402–413, 2023, <https://doi.org/10.37276/sjh.v4i2.282>.
- [4] Sujasmin Sujasmin, "Penerapan Sanksi Kebiri Kimia Bagi Pelaku Tindak Pidana Kekerasan Seksual Anak Dalam Perspektif Hak Asasi Manusia," *J. Usm Law Rev.*, vol. 8, no. 1, pp. 544–558, 2025, <https://doi.org/10.26623/julr.v8i1.11774>.
- [5] M. Arifin, "Tinjauan Hukum Terhadap Hukuman Kebiri Menurut Undang-Undang Nomor 17 Tahun 2016 Tentang Perubahan Kedua Atas Undang – Undang Nomor 23 Tahun 2002 Tentang Perlindungan Anak," *Nusantara Journal of Islamic Studies*, vol. 1, no. 2, pp. 82–87, 2020. <https://doi.org/10.54471/njis.2020.1.2.82-87>.
- [6] I. M. Ellman and T. Ellman, "'Frightening and High': The Frightening Sloppiness of the High Court's Sex Crime Statistics," *SSRN Electron. J.*, vol. 14, no. 2, 2015, <https://doi.org/10.2139/ssrn.2616429>.
- [7] W. L. Marshall and C. Hollin, "Historical developments in sex offender treatment," *J. Sex. Aggress.*, vol. 21, no. 2, pp. 125–135, 2015, <https://doi.org/10.1080/13552600.2014.980339>.
- [8] A. Syarbaini, "Konsep Ta'Zir Menurut Perspektif Hukum Pidana Islam," *J. Tahqiqat J. Ilm. Pemikir. Huk. Islam*, vol. 17, no. 2, pp. 37–48, 2023, <https://doi.org/10.61393/tahqiqat.v17i2.167>.
- [9] L. Arake, "Hukuman Kebiri Kimia Bagi Pelaku Kekerasan Seksual Terhadap Anak Perspektif Fiqh Siyasah," *Al-Adalah: Jurnal Hukum dan Politik Islam*, vol. 5, no. 1, pp. 16–41, 2020. <https://doi.org/10.35673/ajmpi.v5i1.676>.
- [10] R. Saputra, M. Zaid, P. Suwadi, J. Barkhuizen, and T. Tiolinec, "Reconstruction of Chemical Castration Sanctions Implementation Based on the Medical Ethics Code (Comparison with Russia and South Korea)," *Lex Sci. Law Rev.*, vol. 7, no. 1, pp. 61–118, 2023, <https://doi.org/10.15294/lesrev.v7i1.64143>.
- [11] M. Efiyanti and G. Widjaja, "The implementation of chemical castration sanctions against convicts of child sexual crimes in Indonesia by doctors," *J. Leg. Ethical Regul. Issues*, vol. 24, no. Special Issue 1, pp. 1–16, 2021, <https://www.scopus.com/inward/record.uri?eid=2-s2.0->

[85112837993&partnerID=40&md5=ce2db0c1f54ceaa68ece532bdfb619c5](https://doi.org/10.1007/s00259-022-06016-z)

- [12] A. A. Baniahmad, G. Atri Roozbahani, M. Jung, and A. Baniahmad, "The bioactivity of atraric acid as an inducer of cellular senescence in prostate cancer cells is retained by lipophilic derivatives," *Naunyn-Schmiedeberg's Arch. Pharmacol.*, vol. 398, no. 9, pp. 11803–11819, 2025, <https://doi.org/10.1007/s00259-022-06016-z>.
- [13] A. J. Macke *et al.*, "Targeting the ATF6-Mediated ER Stress Response and Autophagy Blocks Integrin-Driven Prostate Cancer Progression," *Mol. Cancer Res.*, vol. 21, no. 9, pp. 958–974, 2023, <https://doi.org/10.1158/1541-7786.MCR-23-0108>.
- [14] B. Zhang *et al.*, "Discovery of BWA-522, a First-in-Class and Orally Bioavailable PROTAC Degrader of the Androgen Receptor Targeting N-Terminal Domain for the Treatment of Prostate Cancer," *J. Med. Chem.*, vol. 66, no. 16, pp. 11158–11186, 2023, <https://doi.org/10.1021/acs.jmedchem.3c00585>.
- [15] T. Watabe *et al.*, "Targeted α -therapy using astatine (211At)-labeled PSMA1, 5, and 6: a preclinical evaluation as a novel compound," *Eur. J. Nucl. Med. Mol. Imaging*, vol. 50, no. 3, pp. 849–858, 2023, <https://doi.org/10.1007/s00259-022-06016-z>.
- [16] H. Gao *et al.*, "Palmitic acid-modified GnRH-Th epitope peptide immunocastration vaccine (W/O/W adjuvant) can effectively ensure the castration and reduce the smell in boars," *Front. Vet. Sci.*, vol. 10, 2023, <https://doi.org/10.3389/fvets.2023.1174770>.
- [17] R. L. Gonciarz *et al.*, "Elevated labile iron in castration-resistant prostate cancer is targetable with ferrous iron-activatable antiandrogen therapy," *Eur. J. Med. Chem.*, vol. 249, 2023, <https://doi.org/10.1016/j.ejmech.2023.115110>.
- [18] J. Monga, F. Valeriote, C. Hwang, S. Gadgeel, and J. Ghosh, "Daclatasvir, an Antiviral Drug, Downregulates Tribbles 2 Pseudokinase and Resensitizes Enzalutamide-Resistant Prostate Cancer Cells," *Mol. Cancer Ther.*, vol. 22, no. 3, pp. 381–392, 2023, <https://doi.org/10.1158/1535-7163.MCT-21-1002>.
- [19] S. Zhao *et al.*, "1-Benzyloxy-5-phenyltetrazole derivatives highly active against androgen receptor-dependent prostate cancer cells," *Eur. J. Med. Chem.*, vol. 246, 2023, <https://doi.org/10.1016/j.ejmech.2022.114982>.
- [20] N. Mesbahi *et al.*, "Second generation PSMA-targeted turn-on probe for imaging cargo release in prostate cancer cells," *Bioorganic Med. Chem. Lett.*, vol. 133, 2026, <https://doi.org/10.1016/j.bmcl.2025.130530>.
- [21] G. A. Rather *et al.*, "Facile synthesis of elastin nanogels encapsulated decursin for castrated resistance prostate cancer therapy," *Sci. Rep.*, vol. 14, no. 1, 2024, <https://doi.org/10.1038/s41598-024-65999-x>.
- [22] R. Qiu, K. Bu, H. An, and N. Tao, "A retrospective study: analysis of the relationship between lactate dehydrogenase and castration-resistant prostate cancer based on restricted cubic spline model," *PeerJ*, vol. 11, 2023, <https://doi.org/10.7717/peerj.16158>.
- [23] S. Wang *et al.*, "Structure-guided design of a selective inhibitor of the methyltransferase KMT9 with cellular activity," *Nat. Commun.*, vol. 15, no. 1, 2024, <https://doi.org/10.1038/s41467-023-44243-6>.
- [24] A. Carrot *et al.*, "Prognostic Value of the Modeled Prostate-Specific Antigen KELIM Confirmation in Metastatic Castration-Resistant Prostate Cancer Treated With Taxanes in FIRSTANA," *JCO Clin. Cancer Informatics*, vol. 8, no. 8, 2024, <https://doi.org/10.1200/cci.23.00208>.
- [25] G. Fazarinc *et al.*, "Male Reproductive Organ Weight: Criteria for Detection of Androstenone-Positive Carcasses in Immunocastrated and Entire Male Pigs," *Animals*, vol. 13, no. 12, 2023, <https://doi.org/10.3390/ani13122042>.
- [26] S. Zeng *et al.*, "Design and characterization of a novel prostate-specific membrane antigen-targeted radioligand modified with a fatty acid albumin binder for optimized circulation half-life," *EJNMMI Radiopharm. Chem.*, vol. 10, no. 1, 2025, <https://doi.org/10.1186/s41181-025-00385-0>.
- [27] A. M. Shah *et al.*, "Discovery of the Enrichment Pathways and Biomarkers using Metabolomics Techniques in Unilateral and Bilateral Castration in Yellow Cattle," *Pak. Vet. J.*, vol. 44, no. 2, pp. 252–259, 2024, <https://doi.org/10.29261/pakvetj/2024.166>.
- [28] C. D. Cruz-Hernández *et al.*, "A Cyanobacteria-Derived RNA Aptamer Resensitizes Prostate Cancer to Hormone Therapy," *Cancer Res.*, vol. 85, no. 14, pp. 2714–2725, 2025, <https://doi.org/10.1158/0008-5472.CAN-24-4039>.
- [29] T. Nguyen *et al.*, "Histone H2A Lys130 acetylation epigenetically regulates androgen production in prostate cancer," *Nat. Commun.*, vol. 14, no. 1, 2023, <https://doi.org/10.1038/s41467-023-38887-7>.
- [30] Q. Cui, C. Huang, X. Zheng, Z. Dong, J. Y. Liu, and J. T. Zhang, "Design, synthesis, and evaluation of

- quinoxaline-based survivin inhibitors for castration-resistant prostate cancer,” *Bioorg. Chem.*, vol. 163, 2025, <https://doi.org/10.1016/j.bioorg.2025.108714>.
- [31] S. Basu *et al.*, “Rational optimization of a transcription factor activation domain inhibitor,” *Nat. Struct. Mol. Biol.*, vol. 30, no. 12, pp. 1958–1969, 2023, <https://doi.org/10.1038/s41594-023-01159-5>.
- [32] M. Comin *et al.*, “Heavy Pigs Reared for Italian Dry-Cured Products: Does Immunocastration Influence the Fatty Acid Profile of Loins and Backfat?” *Animals*, vol. 14, no. 9, 2024, <https://doi.org/10.3390/ani14091284>.
- [33] T. Matsuoka *et al.*, “Newly developed preclinical models reveal broad-spectrum CDK inhibitors as potent drugs for CRPC exhibiting primary resistance to enzalutamide,” *Cancer Sci.*, vol. 115, no. 1, pp. 283–297, 2024, <https://doi.org/10.1111/cas.15984>.
- [34] S. A. Ayodeji, Y. Balytskyi, D. Unaegbu, A. Ingman, C. V. Kelly, and S. Roberts, “High-Affinity Probes for Androgen Receptor Imaging: From Cells and In Silico Modeling to Whole-Body Fluorescent Applications,” *J. Med. Chem.*, vol. 68, no. 15, pp. 15812–15827, 2025, <https://doi.org/10.1021/acs.jmedchem.5c00836>.
- [35] B. Cevatemre *et al.*, “Exploiting epigenetic targets to overcome taxane resistance in prostate cancer,” *Cell Death Dis.*, vol. 15, no. 2, 2024, <https://doi.org/10.1038/s41419-024-06422-1>.
- [36] M. Sharifi *et al.*, “Steroid Sulfatase Regulates Metabolic Reprogramming in Advanced Prostate Cancer,” *Cancers (Basel)*, vol. 17, no. 12, 2025, <https://doi.org/10.3390/cancers17121959>.
- [37] R. S. Thankan, E. Thomas, P. Purushottamachar, D. J. Weber, and V. C. O. Njar, “Salinization Dramatically Enhances the Anti-Prostate Cancer Efficacies of AR/AR-V7 and Mnk1/2 Molecular Glue Degraders, Galeterone and VNPP433-3 β , Which Outperform Docetaxel and Enzalutamide in CRPC CWR22Rv1 Xenograft Mouse Model,” *Bioorg. Chem.*, vol. 139, 2023, <https://doi.org/10.1016/j.bioorg.2023.106700>.
- [38] A. C. Logan, P. Mishra, and S. L. Prescott, “The Legalome: Microbiology, Omics and Criminal Justice,” *Microb. Biotechnol.*, vol. 18, no. 3, 2025, <https://doi.org/10.1111/1751-7915.70129>.
- [39] K. Solberg, “Pakistan moves to tackle acid violence,” *The Lancet*, vol. 376, no. 9748, pp. 1209–1210, 2010, [https://doi.org/10.1016/S0140-6736\(10\)61863-6](https://doi.org/10.1016/S0140-6736(10)61863-6).
- [40] Y. E. Fitria, D. Vianto, A. Mashdurohatur, S. E. Wahyuningsih, J. Hafidz, and D. Setiawan, “Chemical castration in the criminal law system: A study of effectiveness and toxicological impact,” *Edelweiss Appl. Sci. Technol.*, vol. 8, no. 6, pp. 8907–8914, 2024, <https://doi.org/10.55214/25768484.v8i6.3887>.
- [41] L. Gable and J. W. Buehler, “Criticized, fired, sued, or prosecuted: Hindsight and public health accountability,” *Public Health Rep.*, vol. 132, no. 6, pp. 676–678, 2017, <https://doi.org/10.1177/0033354917730820>.
- [42] A. R. Cashmore, “The Lucretian swerve: The biological basis of human behavior and the criminal justice system,” *Proc. Natl. Acad. Sci. U. S. A.*, vol. 107, no. 10, pp. 4499–4504, 2010, <https://doi.org/10.1073/pnas.0915161107>.
- [43] F. Asicioglu, E. E. Kucukbrahimoglu, and U. Ilingi, “Psychotropic drugs evaluated in the context of narcotic drugs according to the new Turkish criminal law,” *Klin. Psikofarmakol. Bul.*, vol. 20, no. 4, pp. 314–320, 2010, <https://doi.org/10.1080/10177833.2010.11790678>.
- [44] J. M. B. Guillén, “Community treatment orders: Bioethical basis,” *Eur. J. Psychiatry*, vol. 25, no. 3, pp. 134–143, 2011, <https://doi.org/10.4321/S0213-61632011000300003>.
- [45] S. H. Lee, J. H. Kwon, Y. W. Won, and J. H. Kang, “Palliative Sedation in End-of-Life Patients in Eastern Asia: A Narrative Review,” *Cancer Res. Treat.*, vol. 54, no. 3, pp. 644–650, 2022, <https://doi.org/10.4143/CRT.2022.187>.
- [46] M. P. Chavula, J. M. Zulu, I. Goicolea, and A. K. Hurtig, “Unlocking policy synergies, challenges and contradictions influencing implementation of the Comprehensive Sexuality Education Framework in Zambia: a policy analysis,” *Heal. Res. Policy Syst.*, vol. 21, no. 1, 2023, <https://doi.org/10.1186/s12961-023-01037-y>.