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# About the Journal

The UniCath Journal of Biomedicine and Bioethics is a scholarly journal established by the Senate of the Catholic University of Croatia on January 16, 2024. The journal has a dual mission: to promote high-quality research in the fields of biomedicine and bioethics, and to serve as a learning platform for young researchers at the beginning of their academic careers.

The journal welcomes a broad range of submissions, including original research articles, editorials, case reports, and other scholarly contributions. Our editorial process is follow the highest standards of peer review and publication ethics with all submitted manuscripts undergoing a double-blind review by at least two expert reviewers. The journal is published twice a year, both in print (ISSN 3043-7164) and online (ISSN 3043-8373) editions.

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The launch of the UniCath Journal of Biomedicine and Bioethics marks a significant step in advancing academic excellence at the Catholic University of Croatia. By supporting the publication of scholarly work, the journal strengthens the University`s educational mission and promotes the integration of research into teaching and practice. Through the promotion of research and open dialogue at the intersection of biomedicine and bioethics, the journal aims to contribute meaningfully to the global scientific community and to foster a culture of inquiry, integrity, and innovation. It provides a platform for the university to highlight original research, build academic visibility, and engage with the international scholarly discourse.

The Editorial Team

# Image Misattribution on the Hayman Technique: Correction Published After 17 Years

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Dear Editor,

I recently searched medical databases for the treatment of postpartum hemorrhage (PPH) in order to update the second edition of the textbook on the issue, Obstetric Operations, for which I am Editor-in-Chief. In addition to the existing articles, I also found numerous novel methods for compression hemostatic procedures.

Among these, I came across a paper categorized as Commentaries, by Ghezzi et al., published in *BJOG: An International Journal of Obstetrics & Gynaecology* in 2007, describing the Hayman technique as a simple method in the management of PPH (1). The authors describe eleven cases of massive PPH in which Hayman's method was successfully applied, with hysterectomy performed in one case. They therefore recommended this technique as a simple method for the treatment of PPH. Furthermore, Figure 1A on page 363 provides a schematic presentation of placing Hayman sutures, while the black-and-white Figure 1B shows the posterior uterine wall with the sutures placed *in situ*.

One year earlier, in 2006, together with my team, I published the first description of the successfully placed B-Lynch compression suture in Croatia, with the respective literature review (2). In that article, the original intraoperative color figure (with the patient's consent) is presented as Figure 1 on page 309, representing the posterior uterine wall with the sutures as part of the B-Lynch procedure and with my fingers holding the uterus on both sides.

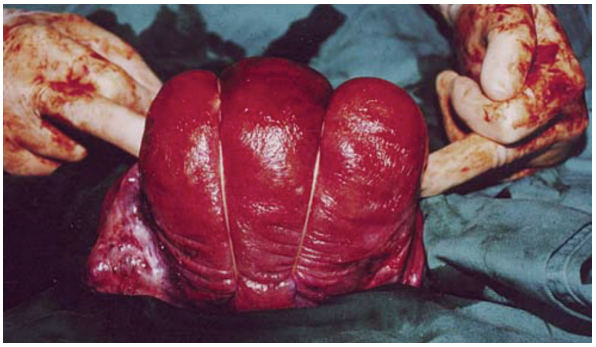

**Figure 1.** *Posterior views of the uterus after application of the B-Lynch brace suture. From: Habek et al. Successful B-Lynch compression suture in the management of massive postpartum hemorrhage: case reports and review. Arch Gynecol Obstet 2006;273:307-9.*

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The same original photograph was published a year later in BJOG in the abovementioned article by Ghezzi et al. as a representation of the Hayman technique, now as a black-and-white photograph, laterally cropped but readily comparable with the original photograph (1).

Moreover, their paper describes the Hayman method; however, looking at the photograph, it is not the Hayman method but the B-Lynch method. Namely, Hayman's double or multiple vertical compression sutures (longitudinal sutures) are placed through-and-through the lower uterine segment with a closed hysterotomy, and the suture can be fixed to the uterine fundus to avoid slippage. In contrast, B-Lynch's single compression sutures are placed below the hysterotomy, starting over the fundus on the posterior wall, where they are placed transversely at the level of the isthmus and returning over the fundus on the anterior wall below the hysterotomy, where they are firmly tightened. They cite it as their own presentation of the method, along with the preceding graphic presentation, without acknowledging the source from which it was taken. Accordingly, there are two issues: professional-scientific and ethical-deontological, as the photograph does not present the respective operative method nor is it the authors' original photograph, because the copyright holders are the publishing house and I, as the corresponding author and operator.

Seeing the problem, I wrote a letter to the editor of the renowned journal BJOG, who then contacted the authors and sent another original image of their own, considering the publication of my image in their 2007 paper to be a mistake. The editorial board of the journal BJOG published a correction in the April issue of this year, in which they state the acknowledgment of the group of authors and, in addition to our original reference, now include the original image of the B-Lynch technique by Ghezzi et al. (3).

However, I am extremely pleased that the editorial board of BJOG asked for a statement from the authors and ethically accepted their response and correction, which they published 17 years later. The above confirms that even in the world of science, omissions are possible, and it is not possible to control all forms of correspondence and the possible publication of other people's photographs. This case proves that one's own academic and scientific integrity is necessary because it is proven to be timeless and unlimited. It is evident that in the world of scientific journalism, it is impossible to control all the components and images sent to journals when publishing papers, and therefore, the statement on ethics and patient consent is the most important factor that the author(s) guarantee as a necessary deontological factor during the publication process.

### Declarations

Conflict of interest. None

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# Religious Young People in Croatia on Beauty, Aesthetic Surgery and Ageing: A Qualitative Study

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## Abstract

**Background:** In contemporary society, media and social networks promote youth and physical beauty as ideals, while ageing is often stigmatised. The growing use of aesthetic procedures like Botox and fillers reflects the influence of the beauty industry. In contrast, Christian anthropology views the body as a temple of the Holy Spirit and ageing as a path to wisdom, raising questions about how religious youth navigate these opposing values.

**Aim:** To explore how religious young people in Croatia interpret contemporary beauty norms, aesthetic surgery, and ageing.

**Methods:** A qualitative design based on semi-structured individual interviews was employed, following COREQ guidelines. Using snowball sampling, seven participants (aged 18–30, self-identified as religious and active in church communities) were recruited. Interviews took place in April–May 2024 at the parish of St. Anthony of Padua in Zagreb. Ethical approval was granted by the Catholic University of Croatia; all participants provided informed consent. Data were analysed using thematic analysis, progressing through open, axial, and selective coding.

**Results:** Participants identified media and social networks as key promoters of unrealistic beauty ideals. In response, they emphasised natural embodiment, spiritual balance, and healthy living. Attitudes toward aesthetic surgery were ambivalent—though not viewed as religiously forbidden, most supported bodily integrity and accepted interventions only for health or functional reasons. Ageing was seen positively, associated with maturity, wisdom, and respect for older adults.

**Conclusion:** Religious beliefs shaped how young participants interpreted cultural norms of beauty and ageing, promoting natural embodiment and viewing ageing as a stage of personal and spiritual growth. Findings highlight the role of religiosity in youth culture and call for further interdisciplinary research on embodiment, beauty, and ageing within contemporary society.

**Keywords**: aesthetic surgery, ageing, beauty, Croatia, religiosity, young people

## Introduction

In contemporary society, the human body has become a central medium for expressing identity, lifestyle, and broader social trends. From the perspective of the sociology of the body, its role extends far beyond biological function, as the body is understood as a social and symbolic construct shaped by sociocultural norms, discourses, and practices (1). Within this framework, beauty, youth, and physical attractiveness are promoted as dominant and desirable norms, so-called ideal types, while ageing and older bodies are increasingly marginalised and symbolically devalued (2). In Western societies in particular, the youthful and slim body is reinforced as a symbol of sexual confidence, power, and self-control (3) with gendered differences in beauty ideals: men are expected to embody a muscular physique and defined facial features, while women are associated with facial symmetry and a toned figure (4). This cultural emphasis on youthful appearance and the social anxiety surrounding signs of ageing have reflected the rise in aesthetic surgery. As Elliott (5) observes, aesthetic procedures are marketed as tools for reclaiming youth, reflecting the economic capitalisation of the cult of youth by the beauty and makeover industries. Supporting this, data show that in 2023 alone, 15.8 million invasive or surgical and 19.1 million non-invasive procedures were performed worldwide, with botulinum toxin (further Botox) (8.8 million) and hyaluronic fillers (5.5 million) being the most common (6). Notably, more than 2.13 million Botox treatments were performed among individuals aged 18–34, including 62,000 minors, indicating a normalisation of anti-ageing culture worldwide. Media and social networks amplify body dissatisfaction and internalisation of idealised beauty norms (7), glorify celebrities (8), and promote reality makeover shows that foster acceptance of aesthetic surgery and the body as a visual project (9). Increasing attention is given to the role of platforms like Facebook, Instagram, and Snapchat in shaping body image: "Social media is known to be highly appearance-focused, with content and messaging promoting idealised, unrealistic, and unachievable beauty ideals and standards" (10). In contrast to these trends, religious beliefs within Christianity promote the body as a temple of the Holy Spirit and an image of God, thereby encouraging care and respect for its natural appearance and rhythm (11). The mechanisms through which religion influences body perception are multidimensional as they include moral norms, common practices, and symbolic discourses that redefine aesthetic ideals. Simultaneously, religion can enhance body perception and strengthen confidence by fostering faith in God's unconditional love, dedication to a purposeful cause, and a sense of transcendence (such as peace and inspiration) through connection with God, religious practices, community acceptance, and social support in self-regulation (3).

These perspectives are outlined in this study using qualitative methodology, with the aim of exploring how religious youth in Croatia perceive beauty, ageing, and aesthetic surgery, focusing on non-invasive procedures such as Botox and fillers. The central premise is that religious beliefs may serve as a protective factor against socio-cultural and media-driven pressures to idealise physical appearance, pressures particularly pervasive in youth culture and the broader anti-ageing discourse. The research offers insight into the dynamics, trends, and values shaping youth perceptions of the body, while also emphasising the often-overlooked role of religiosity as a framework through which contemporary bodily practices are interpreted and negotiated. In doing so, the study contributes to the underexplored relationship between the body and society among religious youth within the Croatian socio-cultural context, adopting a multidisciplinary research perspective that bridges social sciences, humanities, biomedical, and health studies.

## Methods

### *Study design*

A qualitative study was conducted using semi-structured individual interviews. The interview protocol was developed in line with the COREQ guidelines.

### *Ethics*

The protocol was approved by the Ethics Committee of the Catholic University of Croatia (Class No 60204/2411/004; Reg. No 498-15-06-24-004, 25 January 2024). All participants provided written informed consent and were briefed on the study's aims, procedures, data handling, and their rights. Participation was voluntary, anonymity was ensured via pseudonyms, recordings were password-protected and destroyed after transcription.

### *Participants and data collection*

Given the qualitative nature of the research, the aim was not representativeness but a deeper insight into the experiences of religious young people. The study relied on a purposive sample of seven self-identified religious participants (18–30 years) from Croatia, recruited via snowball sampling through parish contacts, with the number set once data saturation was reached. Interviews were held in April–May 2024 in the parish of St. Anthony of Padua, Zagreb, lasting approximately 30 minutes each. Audio was recorded on an iPhone 13 Pro and securely stored.

### *Data analysis*

Audio recordings were fully transcribed and analysed using thematic analysis, following the stages of open, axial, and selective coding (12). Transcripts were systematically reviewed to identify patterns, categories, and themes that reflect the research aim of how religious young people in Croatia interpret contemporary beauty norms, aesthetic surgery, and ageing. We generated 30 initial codes, clustered into 5 subthemes and 3 overarching themes. Media influence encompassed social media, influencers and celebrities within broader beauty norms, while references to inner beauty and natural appearance reflected resistance to media-driven standards. The theme of aesthetic surgery revealed ambivalence, balancing the body as a divine gift with acceptance of ethically regulated interventions and the ageing theme emphasised valuing inner qualities and spiritual depth over physical changes.

## Results

The study included seven religious young people from Croatia, based on results gathered through individual interviews and three main thematic categories: beauty, aesthetic surgery and ageing.

### 1. Beauty

Within the broad academic and public discourse on the existence of socially constructed beauty standards that directly and indirectly shape global aesthetic trends and individual aspirations, the initial question was posed to examine whether participants perceive such ideals to exist in society and in the media. All participants responded affirmatively, citing specific characteristics commonly associated with these standards, such as a slim and toned body, symmetrical facial features, white teeth, and a fashionable appearance, applicable to both genders. Most participants adopted a critical stance toward contemporary youth trends, emphasising the significant role of celebrities and the media, particularly social media platforms like TikTok and Instagram, in promoting unrealistic beauty norms. According to them, these standards contribute to a homogenised appearance among young people, with influencers and celebrities often openly advertising aesthetic procedures and thereby reinforcing a singular and difficult-to-attain image of ideal beauty.

*"What I observe in today's society is that young people, especially teenagers, are starting to look increasingly alike. This is largely due to aesthetic procedures that many young girls, even those my age, undergo in pursuit of a particular physical ideal of beauty. I believe this is all heavily influenced by social media. Many of them strive for that ideal to be accepted socially, to feel a sense of belonging. Personally, I don't subscribe to that. For me, the physical ideal of beauty simply doesn't exist"* (Participant 2).

*"Beauty ideals definitely exist. Some would argue they are even more prominent for women. However, lately, there has been a trend showcasing imperfections in women's bodies. (…) Still, most of the people presented in the media and on Instagram are usually at the gym, muscular.*

*That's the dominant type among influencers. So, when it comes to what these ideals look like, for men it's typically being muscular, tall, and dark-haired, while for women, beauty is focused on facial attractiveness and having a fit body"* (Participant 4).

*"On a surface level, we are bombarded daily with images of celebrities and influencers we follow, whether we want to or not, and we tend to aspire to look more like them. But as a believer, I'd say that the longer you're rooted in faith, and the deeper your relationship with God and the Virgin Mary who serves as a role model for us women, the more you begin to understand that true beauty, both internal and external, lies in being who you genuinely are, in having that inner beauty"* (Participant 5).

While acknowledging media-driven pressures, participants showed a clear awareness of a dominant beauty ideal promoted through celebrities and social media that shapes social expectations and self-image. They recognised these standards as a source of pressure, particularly for young people. Framing their critique through a religious lens, many argued that such ideals distort the "hidden divine beauty" within each person. Religious belief thus emerges not only as moral guidance but as a critical lens through which young believers evaluate and resist societal norms. For them, faith redefines beauty, not as external perfection, but as the wholeness of identity and dignity, as further reflected in their reflections on the concept of beauty in the following section.

### *1.1. Personal Conceptions of Beauty*

The following question in this section addressed participants' personal understanding of beauty. Although the question did not explicitly ask whether their individual views diverged from societal or media-driven conceptions, several participants spontaneously positioned their responses in contrast to mainstream beauty ideals. As expressed by research participants:

*"My vision of physical beauty partly overlaps with, but also diverges from, what is being imposed on us (…). Not everyone has to be blonde, tall, and skinny. Everyone is beautiful in their own way. What matters to me is the inner beauty that radiates kindness from within. You know what they say: sometimes someone seems beautiful until they speak"* (Participant 1).

*"My idea of physical beauty is someone with a natural appearance without silicone, fillers, or Botox because we weren't created to be unnatural. All of that was invented by humans, and I personally don't like it"* (Participant 7).

*"To me, physical beauty means that a young person, or even someone middle-aged or older, regardless of age, takes care of their body. That their body is well-groomed, clean, and not neglected. It's about maintaining one's appearance on a natural basis"* (Participant 6).

*"I think every girl should be natural, the way God created her, not disfigured or covered up in a way that hides what she really looks like. If you wear so much makeup that your real face can't be seen, it's too much. I believe the more natural someone is, the better"* (Participant 3).

Based on participants' statements, it can be concluded that personal conceptions of beauty largely revolve around the ideal of naturalness, often equated with unaltered authenticity and positioned in opposition to aesthetic interventions. In this context, naturalness does not imply neglect of physical appearance, but rather its cultivation through a healthy lifestyle, proper hygiene, and moderation. Several participants also articulated a spiritual dimension of beauty, wherein physical appearance is viewed as secondary to inner goodness and moral integrity, and beauty itself is interpreted as a divine gift that should be accepted and preserved in its original form.

## 2. Aesthetic surgery

The growing popularity of aesthetic surgery raises important questions about how religious youth relate to such practices: whether they reject them entirely or hold more liberal views. To explore this, participants were asked about their general attitudes toward aesthetic procedures and whether they would personally consider undergoing them, either in the near or distant future. Their responses revealed a careful negotiation between the belief that the body is a divine gift not to

be altered lightly and the view that modern medical and technological advances may offer acceptable means of enhancing or preserving one's appearance, particularly given that they do not see aesthetic procedures as inherently opposed to religious teachings.

*"I don't think religion poses a barrier if it doesn't completely distort a person's appearance. If it stays within normal limits, I think it's fine. If it brings satisfaction and helps them feel better in their own skin, that's understandable. Unfortunately, many people go too far and end up altering their face and identity beyond recognition"* (Participant 1).

*"Faith shouldn't necessarily be a barrier. What matters is that the person is doing it for the right reasons, for their own well-being and health, not due to societal pressure. So, every such decision should be carefully thought through and aligned with the values we seek to live by"* (Participant 6).

When it comes to personal engagement with such procedures, participants expressed mixed feelings. While some maintained a strong preference for natural approaches, others remained open to the possibility of aesthetic interventions under specific circumstances, such as ageing or medical necessity.

*"In the near future, within five years, I wouldn't consider either invasive or non-invasive procedures, and I don't think I'd ever undergo an invasive one... Right now, I'm still young, I don't have any wrinkles or signs of ageing. But when I get older, maybe I'll feel different. Maybe I won't be happy with what I see in the mirror. I might try Botox, maybe want slightly fuller lips because, like I said, the media really pushes a certain image of beauty"* (Participant 1.)

*"When I was younger, I used to think about getting a nose job. But now I try to take care of myself naturally... Still, I can't say I'll never consider something like Botox in the future"* (Participant 5).

In conclusion, participants articulated a thoughtful and ethically grounded approach to aesthetic surgery. While clearly advocating for naturalness, bodily authenticity, and respect for the body as created in the image of God, they did not fully reject the use of aesthetic procedures.

## 3. Ageing

Participants' relationship with the topic of ageing is explored through two thematic subsections. The first focuses on their reflections regarding their own ageing, and the second addresses their views on the attractiveness and beauty of older individuals.

This question explored whether participants think about their own ageing, how they imagine themselves as older individuals, and the feelings or images this evokes. Nearly all responded that they do not actively contemplate ageing, as it still feels distant due to their youth. However, ageing was not viewed negatively or with resistance. Instead, most associate it with personal and spiritual growth, the acquisition of wisdom, family life, and intergenerational connections. At the same time, all expressed concern about the physical limitations and illnesses that may accompany old age but also stated their belief that faith will provide strength and support in facing these challenges.

*"Honestly, at this moment, I haven't really thought about ageing. I try to live in the present, in the here and now, and experience it the best I can. But if I had to imagine myself as an older person, the images and feelings that come up are positive (…) I could even say I'm looking forward to being older, to being wiser, maybe even a bit smarter"* (Participant 2).

*"Well, I don't really think about ageing that much, but I can imagine myself as an older person. I picture myself as a grandpa fishing, with lots of grandkids running around me. If I manage to build the kind of family I want, the feelings and images that arise are really beautiful"* (Participant 6).

*"Right now, I don't think much about ageing since I'm 25, and I don't think I'll seriously consider it until I'm maybe 40 or 50. But I do see myself becoming like my grandfather, a good, natural, normal kind of person"* (Participant 7).

*"The more time I spend on social media, the more I see those so-called anti-ageing skincare ads. But honestly, I'm not afraid of ageing. My mindset is not about looking younger but about looking the best, I can in the moment I'm in"* (Participant 5).

### *3.1. Beauty and Attractiveness in Older Age*

The second question in the section on ageing addressed the idea of beauty in older age. Participants discussed whether older individuals can be attractive and beautiful, and whether that is something they themselves would strive for as they grow older. There was a shared consensus that old age carries its own kind of beauty, especially when accompanied by physical activity, self-care, and spiritual depth.

*"When you see certain grandmas and grandpas, you can tell how kind they are, how much goodness radiates from them. And that makes them attractive in their own way. Not physically, because in old age, everyone kind of looks the same, with wrinkles, grey hair, a slower walk, hunched over. But still, you can really see when someone is happy and fulfilled"* (Participant 1).

*"I do believe older people can be attractive and beautiful. Of course, everyone is beautiful in their own way. For me, there are no 'ugly' people. If someone takes care of their body regularly, both physically and spiritually, then yes, they can be very attractive. Honestly though, for me, that's not really the goal in older age. What matters more is being a good person, a kind human being"* (Participant 6).

*"Because of new trends, there are more older people who look beautiful and attractive. They're constantly working out and staying physically active. That's definitely one of my goals for old age: to stay active, so I can age well"* (Participant 4).

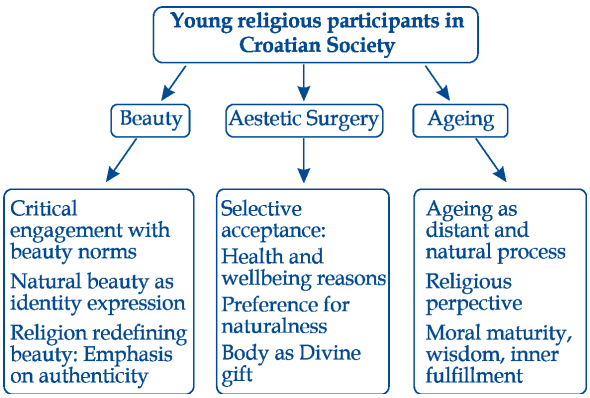


**Figure 1.** *Conceptual framework of themes: beauty, aesthetic surgery, and ageing among young religious participants in Croatian society.*

In conclusion, all participants agreed that older age brings its own distinct form of beauty, one grounded less in physical appearance and more in spiritual depth, marked by inner peace, life wisdom, and values rooted in faith.

The main themes identified in the study are summarised in Figure 1.

## Discussion

The findings highlight the tension between mainstream beauty norms propagated through social media and individual conceptions of authenticity and naturalness. This tension reflects broader sociocultural dynamics of individualism and consumerism, where individuals are expected to shape their identities through physical appearance, while also embracing alternative forms of self-acceptance grounded in authentic personal values. By exploring attitudes toward aesthetic procedures and ageing, the research sheds light on how these young participants navigate cultural expectations and spiritual beliefs following their critical engagement with dominant beauty discourses.

Participants recognised the influence of socially constructed beauty ideals, especially those influenced by media and celebrity culture on platforms like Instagram and TikTok, which were viewed to promote gender specific ideals, aligning with Etcoff's (4) valorisation of masculinity in men and slim, symmetrical features in women. They acknowledged the presence of homogenisation of youth appearance, echoing Jung et al. (10), who link frequent social media use with a stronger internalisation of the idealised body. Rather than passively accepting these pressures, participants demonstrated a critical and active engagement with them and contrasted them with personal values such as authenticity, health and inner beauty, favouring naturalness over artificial enhancement. They contrasted the visual standardisation of youth and unrealistic expectations with the idea of beauty as an expression of individual identity and dignity. Religious belief appeared to provide an alternative framework to mainstream

beauty ideals, as Homan and Boyatzis (13) observed, spiritual connectedness may reduce susceptibility to beauty pressures. This view is further reinforced by Mahoney et al. (14) as well as Holman (15), who report more positive body image among religious individuals, suggesting that faith can serve as a counterbalance to dominant aesthetic narratives.

Participants expressed selective attitudes toward aesthetic surgery. For some, such procedures were framed through a religious lens as violations of divine design, echoing Homan's and Boyatzis's (13) findings on faith-based interpretations of bodily integrity. Others, however, viewed minor aesthetic enhancements as compatible with personal well-being, indicating a more individualised ethics of care. This ambivalence parallels recent findings among Croatian youth, where approximately one-third of students reported openness to aesthetic procedures, often considering a range of invasive and non-invasive options (16). Such perspectives point to a broader cultural reconfiguration in which bodily modification is increasingly integrated into everyday self-care and identity practices, blurring the line between enhancement and normalisation.

Participants rarely reflected on their own ageing, which they perceived as temporally distant due to their youth. This distancing mirrors findings by Rupprecht et al. (17), who note that young people often sustain a selectively youthful self-image in response to societal ageism and the cultural valorisation of youth. Despite this, ageing was not framed negatively; participants associated it with moral maturity, strengthened family ties, and spiritual depth, even citing a family role model as an example. While participants were aware of physical decline and illness, faith was described as a key source of strength and support, redefining beauty in ageing throughout inner qualities and self-care. Such views resonate with Malone et al. (18), who highlight how spirituality offers meaning and resilience in ageing, while Mahoney et al. (14) emphasise its role in shifting focus from external appearance to enduring values like compassion and inner fulfilment.

## Conclusion

This paper presents findings from a qualitative study on how young religious individuals in Croatia perceive beauty, aesthetic surgery, and ageing. The research offers an interdisciplinary perspective by integrating insights from sociology, religious studies, health, and biomedical sciences. While the use of a convenience sample limits the generalizability of findings, the study addresses globally relevant issues within a national context, grounded in the everyday experiences of young people.

Participants demonstrated a critical awareness of socially constructed beauty norms, particularly those influenced by social media and celebrity culture. These norms were interpreted through a religious lens that challenges dominant ideals by emphasising authenticity, inner beauty, and holistic well-being over appearance and conformity. In this way, religion emerges as a key influence in redefining beauty. Although ageing was not a personally pressing issue for participants, it was generally viewed as a natural and meaningful life process, associated with wisdom, spiritual maturity, and personal growth. Attitudes toward aesthetic surgery were ambivalent: while not perceived as religiously prohibited, surgical interventions were approached with caution, and a preference was expressed for maintaining the natural body.

Based on the research insights, we conclude that religiosity functions not only as a source of resistance to aesthetic pressures, but also as a normative and meaning-making framework through which young people in Croatia critically interpret and navigate contemporary social trends shaped by the cult of eternal youth and the normative demands of the beauty industry. At the same time, this very framework highlights the need for future comparative research including young people who are not religious, in order to examine potential differences in perceptions of beauty, aesthetic procedures and ageing, thereby providing a more comprehensive understanding of how diverse value systems shape youth responses to the pressures of the beauty industry.

## Declarations

**Aknowledgements:** This study was part of Gabriela Knežević's Master of Nursing thesis, which was originally written and defended in Croatian. The thesis is available in the online repository: https://urn.nsk.hr/urn:nbn:hr:224:478371

**Authors' contributions:** IBL contributed to the concept and research design; GK was responsible for data collection; IBL, GK, and PM conducted the analysis and interpretation of data, IBL and PM did drafting and writing of the manuscript. All authors approved the final version of the manuscript.

**Ethics considerations:** The study obtained ethics approval from the Ethics Committee of the Catholic University of Croatia (document number 498-15-06-24-004).

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**Competing interests:** The authors declare that they have no conflict of interest.

**Data sharing statement:** Data available on request from the authors.

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# Acute Stroke in a Patient with Heart Failure: A Case Report

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## Abstract

**Background:** Dilated cardiomyopathy (DCM) is the most common type of cardiomyopathy, usually of multifactorial aetiology, characterised by ventricular dilation and impaired systolic function leading to congestive heart failure.

**Aim:** To present a case of idiopathic ischemic stroke in a young patient with dilated cardiomyopathy and to emphasise the importance of early recognition and prompt management of neurological complications in heart failure.

**Case description:** A 36-year-old male was admitted to the Coronary Unit with severe heart failure due to dilated cardiomyopathy (EF 25%) and elevated NT-proBNP levels. Major risk factors included obesity, hypertension, smoking, and dyslipidaemia. On the second day of hospitalisation, the patient developed acute neurological symptoms, and a brain CT confirmed ischemic stroke. Intravenous thrombolytic therapy was administered within the recommended time frame, resulting in complete neurological recovery. Coronary angiography and thrombophilia screening were unremarkable, and the patient was discharged hemodynamically stable on optimal medical therapy.

**Conclusion:** This case highlights the high morbidity of dilated cardiomyopathy and its potential neurological complications. Early recognition, prompt treatment, and effective risk factor management are essential for better outcomes.

**Keywords**: heart failure, dilated cardiomyopathy, risk factors

## Introduction

Cardiomyopathy is defined as damage to the heart muscle, characterised by structural and functional changes, caused by either acquired or inherited factors (1). There are three types of cardiomyopathies: dilated, hypertrophic, and restrictive (2). Dilated cardiomyopathy is the most common form. It is characterised by ventricular dilatation and consequently, impaired systolic function, presenting as congestive heart failure (3). Decades of research have established the multifactorial aetiology of dilated cardiomyopathy. The most common causes include genetic mutations, autoimmune diseases, acquired infections, and exposure to toxins. Many cases of dilated cardiomyopathy could actually be classified as idiopathic due to the need for a complex array of invasive and non-invasive tests, whose global availability is inconsistent (4). The prognosis for heart failure has significantly improved in recent decades due to ongoing efforts in establishing early diagnosis (5). These advances have led to higher survival rates, improved preventive policies, and better monitoring of patients (6). In Croatia, cardiovascular diseases, as chronic non-communicable diseases, remain the leading cause of death in both genders (7). The burden of these diseases is a major public health issue, carrying consequences such as health costs, disability, and work incapacity (8). The following case presents a 36-year-old patient with idiopathic dilated cardiomyopathy who experienced a stroke during acute decompensation. This case highlights the importance of early recognition and prevention of serious complications in young patients with this condition.

## Methods

### *Study design*

This is a case report.

### *Ethics*

The Ethics Committee of the Sibenik - Knin County General Hospital approved the case report in accordance with ethical guidelines, on September 18, 2023 (Class No.: 01-23006/1-23).

The patient provided written consent for the use of personal medical information and for the publication of this report, with anonymity fully ensured.

### *Data collection*

Data were collected on a patient hospitalised at the Sibenik - Knin County General Hospital in September 2023. Information was obtained by reviewing the patient's medical records, clinical course, and outcome.

## Case report

A 36-year-old patient was hospitalised in the Coronary Unit of the General Hospital of Sibenik - Knin County under a severe clinical condition of heart failure, with dilated cardiomyopathy as the underlying cause, elevated NTproBNP levels, and significantly impaired left ventricular systolic function (EF 25%). The patient experienced symptoms two weeks prior to hospitalisation, with significant progression immediately before admission. Symptoms included effort intolerance, dull chest pain worsened in a lying position, and nausea on the day of hospital admission. Interestingly, there was no remarkable medical history. An electrocardiogram showed a sinus rhythm at around 100 beats per minute. Chest X-ray revealed an enlarged heart, while laboratory tests showed elevated NTproBNP and D-dimer levels. Given the clinical condition and laboratory findings, the patient was admitted to the Coronary Unit, and targeted treatment and further diagnostic workup began. Echocardiography, the "gold standard" in diagnosing heart failure, revealed significant systolic dysfunction with an ejection fraction of only 25%. Risk factors for cardiovascular disease in this patient included obesity, physical inactivity, hypertension, and smoking. All these risk factors contributed to the deterioration of the existing condition and were predictors of a poor outcome. On the second day of hospitalisation, the patient was found disoriented and confused, conscious but unable to respond verbally. The patient understood commands but could not respond. The clinical picture suggested a new stroke, and a neurological consult led to an urgent brain MSCT, confirming the stroke.

Many studies have provided evidence that patients with heart failure have an increased risk of ischemic stroke compared with the general population, with a prevalence of between 8-11% (9). The most common cause is cardioembolic aetiology, in which thrombus formation occurs due to atrial fibrillation or left ventricular hypokinesia (10). In addition to the causal relationship between heart failure and ischemic stroke, both entities represent manifestations of similar underlying risk factors, such as hypertension and diabetes mellitus (11). A two-way brain-heart interaction is inherent in the pathophysiology of heart failure, where heart failure can be the cause of acute brain injury or acute brain injury can cause or worsen the cardiovascular system (9). Despite a comprehensive diagnostic workup, the acute stroke event in this patient was classified as idiopathic. The patient was successfully treated for stroke according to current guidelines with the aim of achieving reperfusion of the brain tissue. According to the AHA/ASA guidelines for the treatment of acute stroke, the patient received intravenous thrombolytic therapy within the recommended time frame from the onset of symptoms (12). Vital signs were continuously monitored during therapy: blood pressure, heart rate, and oxygenation. The patient was initially disoriented and unable to respond verbally, but after therapy, his orientation and ability to respond verbally gradually improved. Recognition of initial neurological symptoms and rapid response after the end of thrombolytic therapy left the patient without neurological deficits. Invasive cardiological testing showed normal coronary vessels. Tumour detection tests were negative, and thrombophilia tests did not reveal acquired or inherited thrombophilia. For the remainder of the hospital stay, the patient remained hemodynamically and arhythmologically stable. He was discharged home on optimal medical therapy, which included an SGLT2 inhibitor, a beta-blocker, antiplatelet therapy and a combination of calcium channel blockers and diuretics. As part of further diagnostic workup, and with the goal of uncovering the aetiology of the advanced heart failure.

## Discussion

According to the 2021 European Cardiology Society guidelines, acute heart failure (AHF) is described as the sudden or gradual onset of symptoms and/or signs of heart failure, severe enough to require urgent medical intervention, usually resulting in unannounced hospitalisations or emergency room visits (13). The most common cause of heart failure is dilated cardiomyopathy. Since the disease develops multifactorially, with an inherited predisposition combined with certain risk factors, it is often observed in the younger population. Prevalence increases in the thirties and forties but can occur at any age (14). The prognosis is poor and is characterised by heart failure, accompanied by an increased incidence of sudden death. Consequently, the treatment outcome for patients with dilated cardiomyopathy is unpredictable. Modifiable risk factors such as reduced physical activity, excessive body weight, smoking, dyslipidaemia, and hypertension represent an independent risk for worsening existing cardiovascular disease. Therefore, treatment should focus on modifiable risk factors as part of primary and secondary prevention. The focus should be on early recognition of heart failure symptoms such as fatigue, dyspnoea, and oedema so that timely intervention can be made, as symptoms become more pronounced as the disease progresses. Public health policies should aim to reduce the incidence of cardiovascular diseases, reduce hospitalisation rates, and provide more effective treatments that result in a better quality of life for patients (13).

In a pilot study by Pereira Sousa et al. (2021), it was shown that educating patients with chronic heart failure on symptom recognition and self-management (weight monitoring, fluid intake) can significantly improve their ability to self-care, reduce the number of emergency admissions, and improve quality of life. These findings highlight the importance of patients learning to recognise early signs of disease deterioration, as this directly impacts treatment outcomes and reduces the burden on the healthcare system (15).

Currently, 26 million people worldwide live with heart failure, and in the general population, it occurs in approximately 2.0% of people, and each year in Western countries, about 0.20% of new cases are recorded (16). Despite the burden it brings, awareness of the disease remains low. Timely detection of symptoms contributes to a positive treatment outcome even in advanced stages of the disease. Raising public awareness can improve treatment outcomes and save lives (17).

Patients with heart failure are at higher risk for thromboembolic incidents, with heart failure being the second most important risk factor for stroke. In heart failure, there is chronic activation of the sympathetic nervous system, which contributes to disease progression and increases the risk of complications (16). Reduced left ventricular ejection fraction is a strong predictor of stroke in these patients, as is the presence of atrial fibrillation. In contrast, the risk of death increases in proportion to the severity of heart failure.

Ying Hsuan and colleagues conducted a study assessing the long-term risk of stroke in patients with heart failure. They concluded that patients with heart failure are at an increased risk for both ischemic and haemorrhagic stroke. Furthermore, the association between stroke and heart failure was statistically significant and showed a higher incidence of stroke in the younger population (17).

Patients with chronic heart failure are treated according to the current guidelines of the European Society of Cardiology. Therapy includes ACE inhibitors to reduce cardiac workload, beta-blockers to regulate heart rhythm, mineralocorticoid receptor antagonists (MRAs) to prevent excess fluid accumulation, and SGLT2 inhibitors to improve cardiac function. Each therapy is individualised and adjusted to the patient's clinical status with the aim of reducing hospitalisations and prolonging the life expectancy of patients with heart failure (13).

Timely identification of the aetiology of cardiomyopathy is crucial for further treatment and prognosis of the disease outcome. It can occur as a result of various factors, from genetics to various aetiological agents. Some of them are: myocarditis, most often of viral aetiology, but also of bacterial or autoimmune genesis, which leads to inflammatory damage to the myocardium, and toxic damage (alcohol, cocaine). In addition to the above, metabolic and endocrine disorders such as diabetes mellitus, thyroid dysfunction or nutritional deficiencies can also promote the development of the disease. Despite the above, in a certain number of cases the cause remains idiopathic, i.e. unrecognised (3).

Hereditary cardiomyopathies are heart muscle disorders that can significantly affect the health and quality of life of patients. Although we now know which genetic changes can cause the disease, the application of this knowledge in treatment is still limited. Clinical manifestations often depend not only on a single mutation, but also on a combination of different genetic variations, concomitant diseases and lifestyle habits. Advances in genetics allow the development of therapies tailored to specific genetic profiles, while precision medicine seeks to tailor treatment to each patient in order to make it as effective and safe as possible (18).

## Conclusion

Cardiovascular diseases represent a growing public health problem. Heart failure is characterised by the complexity of its aetiology and pathophysiology. Timely detection of disease symptoms contributes to positive treatment outcomes, even in the advanced stages. Raising public awareness can improve treatment outcomes and save lives. The most commonly diagnosed dilated cardiomyopathy leads to a series of risk factors, with genetic predisposition playing a central role in the development of the disease. It can be concluded that the severity of symptoms does not correlate with the severity of the disease but correlates with survival rates.

## Declarations

**Authors' contributions:** All the authors have contributed equally to this work and have read and approved the final version of the manuscript.

**Ethics considerations:** This study was approved by the Ethics Committee of the Sibenik - Knin County General Hospital (Class No.: 01-23006/1-23).

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**Competing interests:** The authors declare no conflicts of interest.

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# Single-Centre, Prospective, Non-Randomised Comparative Study of Topical Lidocaine/Prilocaine (EMLA) versus No Anaesthetic During Paediatric Venipuncture

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## Abstract

**Background:** Venipuncture is a common paediatric procedure often associated with pain and fear. Inadequate pain management can cause distress, poor cooperation, and avoidance of future medical procedures. Topical anaesthetics such as EMLA cream offer a simple, non-invasive method of pain relief.

**Aim:** To evaluate the effect of topical EMLA cream on children's pain and fear during venipuncture.

**Methods:** This single-centre, prospective, non-randomised comparative study was conducted at the Children's Hospital Srebrnjak, Zagreb, Croatia, from October to December 2024. A total of 104 children aged 7–10 years requiring venipuncture were included. Participants were assigned to either the intervention group (n = 52) or the control group (n = 52) based on parental consent for topical anaesthetic use. Pain intensity after venipuncture was assessed using the Visual Analogue Scale (VAS, 0–10), and fear was self-rated before the procedure on a numerical scale from 0 to 10. Data were analysed using the Mann–Whitney U test and Spearman's correlation, with significance set at $P < 0.05$.

**Results:** Children who received EMLA reported significantly lower pain scores (mean VAS 2.1 ± 1.2) compared with controls (4.8 ± 1.5, $P < 0.001$). Pre-procedural fear showed a moderate positive correlation with pain intensity ($\rho = 0.45$, $P < 0.01$). No significant sex differences were found.

**Conclusion:** Topical EMLA cream effectively reduces procedural pain in children during venipuncture. Addressing both pain and fear is essential for a comprehensive and compassionate approach to paediatric care.

**Keywords:** venipuncture, children, pain, EMLA, local anaesthetic, non-randomised comparative study

## Introduction

Pain is defined by the International Association for the Study of Pain (IASP) as an unpleasant sensory and emotional experience associated with actual or potential tissue damage (1). It is not only a physiological signal but also a subjective experience influenced by emotional, psychological, and social factors (2). In modern healthcare, pain is recognised as the fifth vital sign, which underscores the need for systematic assessment in every patient encounter (3).

In paediatrics, pain management is particularly complex. Children undergoing diagnostic and therapeutic procedures often report procedural pain as more distressing than the underlying illness itself (2, 3). Venipuncture, one of the most frequently performed invasive procedures, represents a major source of acute pain and anxiety (4, 5). Poorly managed pain during venipuncture can lead to long-term consequences, including needle phobia, heightened anxiety, and avoidance of medical care (6).

Accurate pain assessment in children requires age-appropriate tools. Younger children often rely on behavioural scales such as FLACC (Face, Legs, Activity, Cry, Consolability) or NIPS (Neonatal Infant Pain Scale), while older children can use self-report scales such as Wong-Baker FACES or the Visual Analogue Scale (VAS) (6-8). For children aged seven and above, the VAS has been shown to be both reliable and valid (6).

Children's cognitive development also influences their understanding of and response to pain. According to Piaget's theory, children aged 7–11 are in the concrete operational stage, which enables them to verbalise their experiences, understand simple medical explanations, and cooperate with healthcare staff (9).

At the same time, fear plays a crucial role in pain perception. Fear of needles is widespread and may amplify the intensity of pain (10-13). Distracting techniques, parental presence, and empathetic communication have been identified as effective non-pharmacological interventions (14).

Pharmacological methods, such as the application of topical anaesthetics, further enhance pain relief. Topical anaesthetics like EMLA cream, which contains lidocaine and prilocaine, provide localised analgesia by blocking sodium channels in peripheral nerves (15-18). They are widely recommended for minor procedures such as venipuncture and have demonstrated efficacy in reducing both pain and distress in children (15-21). However, despite evidence supporting their use, these measures are not consistently implemented in routine paediatric practice (18, 19, 21).

The present study aimed to evaluate the effect of EMLA cream on children's perception of pain and fear during venipuncture and to explore possible associations with sex.

## Materials and methods

### *Study design*

This was a single-centre, prospective, non-randomised comparative study.

### *Ethics*

The study was approved by the Ethics Committee of the Children's Hospital Srebrnjak (approval no. 04-891/1-24). Written informed consent was obtained from parents or legal guardians prior to participation.

### *Participants*

Participants were children aged 7–10 years who required venipuncture for diagnostic purposes at the Children's Hospital Srebrnjak, Zagreb. The study was conducted from October to December 2024. Inclusion in the study was based on parental consent for the use of a topical anaesthetic: children whose parents consented formed the EMLA group, while those whose parents declined constituted the control group. Exclusion criteria included known allergy to lidocaine/prilocaine, dermatological conditions at the puncture site, or developmental disorders interfering with communication.

### *Group allocation*

Participants were assigned to either the intervention (n = 52) or control group (n = 52) based on parental consent for EMLA application (self-selection). Consequently, group allocation was non-randomised, and potential self-selection bias is acknowledged.

### *Intervention*

In the intervention group, 1 g of EMLA cream was applied to the venipuncture site (approximately 2–3 $cm^2$ area) and covered with an occlusive dressing for 60 minutes before the procedure. The control group underwent standard venipuncture without anaesthetic. Both groups received supportive non-pharmacological measures, including parental presence and verbal reassurance.

### *Data collection and instruments*

Pain intensity was self-rated immediately after venipuncture using the Visual Analogue Scale (VAS, 0 = no pain, 10 = worst imaginable pain). Fear was self-rated immediately before the procedure using a numerical scale from 0 (no fear) to 10 (extreme fear). Each child verbally indicated a number representing their fear level, which was recorded by the research nurse.

### *Statistical analysis*

Data were analysed using IBM SPSS Statistics 29.0 (IBM Corp., Armonk, NY). Descriptive statistics summarised demographic characteristics. Between-group comparisons were conducted using the Mann–Whitney U test, and correlations were assessed with Spearman's rank correlation coefficient. Statistical significance was set at $P < 0.05$, with exact p-values reported where applicable.

## Results

A total of 104 children participated in the study, evenly distributed between the intervention group (n = 52) and the control group (n = 52). The mean age of participants was 8.5 ± 1.0 years in the intervention group and 8.6 ± 0.9 years in the control group, with no statistically significant difference between groups ($P > 0.05$). Both groups showed an almost equal sex distribution (26 boys and 26 girls in the intervention group; 27 boys and 25 girls in the control group), minimising the risk of gender-related confounding (Table 1).

**Table 1.** *Demographic characteristics of participants*

| Characteristic | Intervention (n = 52) | Control (n = 52) |
|---|---|---|
| Age (mean ± SD) | 8.5 ± 1.0 | 8.6 ± 0.9 |
| Sex (boys/girls) | 26/26 | 27/25 |

### *Pain intensity*

Pain assessment using the Visual Analogue Scale (VAS) revealed that children in the intervention group reported significantly lower pain intensity compared to the control group. The mean VAS score in the intervention group was 2.1 ± 1.2, while in the control group it was 4.8 ± 1.5 ($P < 0.05$). Nearly half of the children in the control group (48%) reported pain levels of 5 or higher, whereas in the intervention group, only 12% reported scores at or above this threshold. Importantly, none of the children in the intervention group rated their pain as "severe" (≥ 7 on the VAS), while this was reported by 15% of the children in the control group. These findings clearly highlight the analgesic efficacy of topical anaesthetic application.

### *Fear and pain correlation*

Fear levels, assessed through a child-friendly questionnaire, showed a moderate positive correlation with pain intensity (Spearman's $\rho = 0.45$, $P < 0.01$). Children who expressed higher pre-procedural fear were more likely to report elevated VAS scores, regardless of anaesthetic application. This emphasises the close interplay between emotional state and pain perception in paediatric patients.

### *Sex differences*

Although no statistically significant differences were found between boys and girls in either group, a trend toward greater variability in girls' reports was observed. Girls were more likely to report both very

low and very high pain scores compared to boys, whose responses tended to cluster more narrowly around the mean. This variability suggests potential differences in coping strategies or emotional expression between genders, which warrants further investigation in larger samples.

### *Subgroup analysis*

When stratified by age, children in the younger subgroup (7–8 years) generally reported slightly higher pain scores compared to those aged 9–10 years, although this difference did not reach statistical significance ($P > 0.05$). This trend may reflect developmental differences in coping skills and understanding of the procedure.

### *Distribution analysis*

Examination of the distribution of pain scores revealed that while the majority of children in the intervention group clustered around low VAS scores (1–3), the control group exhibited a broader spread, with a considerable number of participants reporting scores in the moderate-to-severe range (5–7). This divergence emphasises not only the analgesic benefit of EMLA cream but also its consistency in reducing variability in children's responses.

### *Fear and variability*

Descriptive analysis showed that children who rated themselves as "very afraid" before the procedure almost always reported higher pain scores, even if they had received EMLA. This highlights the profound impact of psychological factors and suggests that addressing fear in parallel with pharmacological management could yield the most favourable outcomes.

Children in the intervention group reported significantly lower VAS scores than the control group (mean 2.1 ± 1.2 vs. 4.8 ± 1.5, $P < 0.05$) (Table 2).

**Table 2.** *Pain intensity (VAS scores)*

| Group | Mean VAS ± SD | *P*-value |
|---|---|---|
| EMLA group | 2.1 ± 1.2 | < 0.05 |
| Standard venipuncture | 4.8 ± 1.5 | |

Fear levels were positively correlated with pain intensity ($\rho = 0.45$, $P < 0.01$) (Figure 1). No significant sex differences were found, though greater variability was noted among girls.

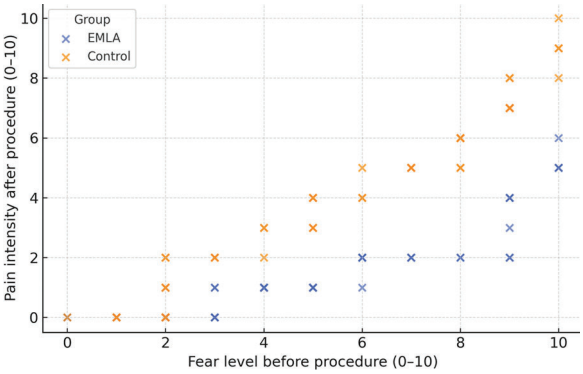


**Figure 1.** *Correlation between pre-procedural fear and pain intensity in children with (blue) and without (orange) topical anaesthetic.*

## Discussion

The results of this study confirm that topical local anaesthetic application significantly reduces children's pain during venipuncture, aligning with a growing body of evidence advocating for the routine use of EMLA cream and similar agents in paediatric practice (18,22). The nearly 50% reduction in mean VAS scores between the intervention and control groups underscores the clinical relevance of this intervention. By minimising pain associated with venipuncture, healthcare providers can improve immediate patient comfort and help prevent long-term psychological consequences often linked to repeated painful procedures in childhood, such as needle phobia and avoidance of medical care (23–25).

One of the most significant findings of this study was the positive correlation between fear and pain perception. This supports the biopsychosocial model of pain, which recognises that physical sensations are closely linked with psychological and emotional states (25). In paediatric populations, anticipatory fear of needles is a well-documented phenomenon that can amplify the subjective experience of pain (6,12). Even when pharmacological analgesia was provided, children with higher levels

of fear still tended to report more pain. This suggests that addressing emotional and psychological factors is equally important as pharmacological management. Therefore, techniques such as distraction, parental presence, and therapeutic communication should be integrated alongside anaesthetic use to achieve comprehensive pain relief (14,19).

The present findings are consistent with international studies demonstrating the effectiveness of EMLA cream in reducing venipuncture pain (18). By demonstrating significant benefits even in a modest sample, this study contributes to the growing body of evidence supporting the systematic implementation of local anaesthetics in paediatric clinical practice. Although no statistically significant differences were found between boys and girls, the greater variability observed in girls' responses may indicate gender-related differences in emotional expression or coping mechanisms. Previous studies suggest that girls may report pain more openly (26), whereas boys may underreport discomfort due to cultural or social expectations. Although speculative in this context, these findings warrant further investigation in larger samples, as understanding such differences could help tailor paediatric pain management strategies.

From a clinical and ethical perspective, the results of this study have immediate implications. Standardising the use of topical anaesthetics such as EMLA cream could significantly enhance the quality of paediatric care, ensuring that children are not subjected to unnecessary pain during routine procedures. Nurses, who are often at the frontline of venipuncture, play a key role in implementing these measures (27). Moreover, educating parents about the availability and efficacy of topical anaesthetics could increase their acceptance and demand, thereby promoting a culture of pain-sensitive paediatric practice. The findings of Taddio et al. (2013) demonstrated that educating parents about pain management strategies is highly effective in increasing their knowledge, confidence, and intention to apply these interventions. Before reviewing the educational materials, most parents were unaware of evidence-based methods for reducing procedural pain. However, after exposure to pamphlets and videos, their understanding and confidence improved significantly. The authors concluded that under-treatment of pain during routine procedures is not due to parental indifference, but rather to a lack of knowledge—an issue that can be addressed through targeted education (28).

In addition to pharmacological interventions, integrating psychological support and non-pharmacological strategies is crucial to effectively address the multidimensional nature of procedural pain. Studies have shown that distraction techniques, relaxation, guided imagery, and parental presence can significantly reduce both pain intensity and anxiety during venipuncture and other needle-related procedures. For example, a randomised clinical trial demonstrated that combining topical anaesthetic with distraction led to a marked decrease in children's reported pain and fear levels compared to standard care (23). Other studies have further confirmed that non-pharmacological interventions serve as valuable adjuncts to pharmacological analgesia, enhancing comfort and cooperation during procedures (14,29,30).

The ethical dimension of paediatric pain management should also be emphasised. Children have the right to adequate pain control, as recognised by international health organisations (20,31). Undertreating or neglecting procedural pain can therefore be considered a breach of this right. Ensuring access to effective analgesic strategies, such as topical anaesthetics, is not only a matter of best clinical practice but also an ethical responsibility.

This study has several strengths and limitations that should be acknowledged. Its main strength lies in the prospective design and inclusion of both physiological and psychological aspects of pain assessment. Incorporating self-reported fear scores provided valuable insights into the emotional dimension of paediatric pain. However, the single-centre setting may

limit generalisability, and group allocation based on parental consent rather than randomisation introduces potential self-selection bias. Furthermore, long-term effects and responses to repeated procedures were not evaluated. Despite these limitations, the results strongly support integrating topical anaesthetics into routine paediatric practice. Future research should explore multimodal approaches that combine pharmacological, psychological, and environmental interventions to further improve children's experiences during medical procedures.

## Conclusion

The study confirmed that the use of topical local anaesthetic significantly reduces pain intensity in children during venipuncture. A strong positive correlation between fear and pain perception indicates that emotional factors substantially influence the experience of pain. Although no significant gender differences were found, greater variability in girls' responses suggests possible differences in emotional expression. These findings highlight the importance of addressing both physical and psychological components of pain to improve the quality of paediatric care.

### Declarations

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**Authors' contributions:** Sara Belandžić designed and conducted the study, analysed the data, and drafted the manuscript under the supervision of Assoc. Prof. Ivan Šklebar. Both authors approved the final version.

**Ethics considerations:** The study was approved by the Ethics Committee of the Children's Hospital Srebrnjak (document number 04-891/1-24). Written informed consent was obtained from parents or guardians.

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# Ethical Dilemmas and Challenges in the Application of Prenatal Diagnostics

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## Abstract

Prenatal diagnostics is one of the most dynamic areas of modern medicine. Its application provides invaluable benefits through early detection of fetal malformations, timely planning of delivery, and the possibility of intrauterine therapeutic interventions. At the same time, it opens a series of ethical challenges related to maternal autonomy, the dignity of the unborn child, the responsibility of physicians, and the role of society.

The article presents the fundamental principles of medical ethics – autonomy, beneficence, non-maleficence, and justice – as key guidelines in decision-making. Special attention is devoted to the dangers of test commercialization, the risk of false-positive results, and the possibility of discrimination based on sex or disability. Emphasis is placed on the importance of trust and quality communication between the physician and the family, as well as the need for equal access to modern methods regardless of socioeconomic status.

Future developments in prenatal diagnostics, including the application of artificial intelligence and genomic analysis, raise new questions about the boundary between medically justified procedures and covert eugenics. Therefore, prenatal diagnostics cannot be viewed merely as a medical procedure but also as a socio-ethical process in which personal decisions, legal frameworks, and cultural values intertwine.

In conclusion, prenatal diagnostics justifies its place in modern medicine only if it remains focused on the protection of life and respect for human dignity. This requires ongoing dialogue between medicine, ethics, and society, as well as strong social support for families with children with disabilities, since their integration and acceptance represent a measure of the humanity and maturity of the community.

**Keywords**: prenatal diagnostics, medical ethics, autonomy, beneficence, non-maleficence, justice, fetal anomalies

## Introduction

Prenatal diagnostics encompasses a set of procedures and methods used to assess the health, development, and genetic status of the fetus before birth. The primary goals are the detection of structural anomalies, chromosomal abnormalities, and genetic and metabolic disorders in the early stages of pregnancy, thereby enabling timely counseling, perinatal planning, and, in certain cases, therapeutic interventions (1,2).

The development of prenatal diagnostics began in the second half of the 20th century with the introduction of ultrasound into everyday clinical practice and later expanded with the introduction of invasive methods (amniocentesis, chorionic villus sampling) as well as sophisticated molecular and genetic tests (3–6). These methods have greatly contributed to a better understanding of intrauterine development and have enabled advances in safeguarding life, both through the early detection and treatment of certain fetal diseases and through the planning of safe delivery in specialized centers (7).

Despite continuous improvements in these methods, it is important to note that approximately 2–3% of children are born with congenital malformations, while the vast majority (about 97–98%) are born healthy (8). It is precisely in this minority of pregnancies that the key ethical dilemmas of prenatal diagnostics arise. While the main purpose of prenatal diagnostics is to improve the health of both mother and child, in practice, diagnostic findings often provoke fear, uncertainty, and pressure in decision-making, even when the pregnancy outcome ultimately proves favorable. Thus, an atmosphere is frequently created in which pregnant women are preoccupied in advance with the possibility of an adverse outcome, although such cases are relatively rare.

Although the fundamental medical purpose of prenatal diagnostics is to improve pregnancy outcomes and maternal and child health, ethical dilemmas arise when diagnostic findings become the decisive factor in parental decisions regarding the continuation or termination of pregnancy. At the heart of these dilemmas lies the balance between the autonomy of the pregnant woman, the rights and dignity of the unborn child, and the broader social context of selective reproductive decision-making (9).

### Methods Used in Prenatal Diagnostics

The development of prenatal diagnostics has brought a wide range of methods currently used in clinical practice. These are most often divided into non-invasive and invasive procedures, while molecular and genomic methods have become increasingly important in recent years. Preimplantation genetic diagnostics, performed exclusively within the framework of in vitro fertilization procedures, also occupies a special place.

Among non-invasive methods, ultrasound diagnostics is the foundation of prenatal screening and has been in routine use for decades. Standard ultrasound examinations in the first and second trimesters allow assessment of fetal anatomy, detection of most major malformations, and evaluation of growth and development (1,10).

Of particular importance is the so-called mini anomaly scan, performed at the end of the first trimester, most often between 11 and 13+6 weeks of gestation. In addition to the basic measurement of crown–rump length (CRL) for precise determination of gestational age, the scan includes assessment of nuchal translucency, presence of the nasal bone, blood flow in the ductus venosus, flow across the tricuspid valve, as well as early morphological indicators of brain, facial, abdominal wall, spine, and limb development (7,10). This examination, in combination with biochemical markers, significantly increases the sensitivity of screening for chromosomal anomalies and enables early detection of a large number of structural malformations.

First-trimester combined screening includes nuchal translucency measurement by ultrasound and biochemical markers (PAPP-A and free β-hCG) in maternal blood. This method, performed between 11 and 13+6 weeks of pregnancy, has high sensitivity for trisomy 21 and other common chromosomal abnormalities (11). When combined with

maternal age and other risk factors, it achieves detection of about 85–90% of Down syndrome cases, with an acceptable false-positive rate (12).

Non-invasive prenatal testing (NIPT) of cell-free fetal DNA in maternal blood represents the most important advancement in modern screening for chromosomal abnormalities. This method is based on the analysis of fragmented fetal DNA circulating in maternal plasma outside fetal cells and provides very high sensitivity and specificity for the most common aneuploidies (trisomy 21, 18, and 13) (13). Although NIPT has great clinical value, it is a screening rather than a diagnostic method, since the analyzed fraction of fetal DNA originates from the placenta; therefore, abnormal results require confirmation by invasive procedures (14).

Historically, in the second trimester, chromosomal abnormalities were screened using the double test (AFP and hCG), later the triple test (AFP, hCG, and estriol), and eventually the quadruple test (with the addition of inhibin A). These tests today have very limited clinical value, having been replaced by combined screening and NIPT, given their significantly lower sensitivity and specificity (15).

Invasive methods include chorionic villus sampling (CVS) and amniocentesis (AC). These represent standard invasive procedures for obtaining fetal genetic material. CVS is most often performed in the first trimester, while AC is performed after the 15th week of pregnancy. Both procedures are associated with a small but non-negligible risk of miscarriage, estimated at 0.1–0.3% in experienced centers (16). Cordocentesis, or fetal blood sampling from the umbilical cord, is less frequently used today due to its technical difficulty and higher risk, but still plays an important role in specific indications, such as diagnosis and treatment of fetal anemia or infections (17).

The introduction of chromosomal microarray analysis (CMA) enabled the detection of submicroscopic deletions and duplications, which significantly increased diagnostic yield compared to standard karyotyping (18). In addition, next-generation sequencing (NGS), including whole exome sequencing (WES) and whole genome sequencing (WGS), is becoming increasingly available in prenatal diagnostics, particularly in cases of complex malformations when standard methods fail to provide a clear answer (19). However, the application of these methods also raises numerous ethical dilemmas, including the interpretation of variants of uncertain significance, secondary findings, and the possibility of predicting diseases that manifest later in life.

A special category is preimplantation genetic testing (PGT/PGD), performed exclusively within in vitro fertilization (IVF) procedures. This method enables genetic analysis of embryos before uterine transfer, detecting chromosomal and certain monogenic diseases (20). The primary purpose of PGT is to prevent the transmission of severe genetic diseases in families with known risk, while in practice, it is also often used in the context of PGT-A (preimplantation genetic testing for aneuploidy) to increase the probability of implantation and reduce the risk of miscarriage. Although this is a highly sophisticated method, its application raises numerous ethical issues, including embryo selection, the possibility of "positive eugenics," and the boundaries of reproductive medicine.

## Information, Communication, and Trust in Prenatal Diagnostics

It is important to emphasize that the findings of prenatal diagnostics are not always final or unambiguous. Ultrasound markers, biochemical screenings, and even the most advanced genetic tests have certain rates of false-positive and false-negative results (9,21). For example, increased nuchal translucency may indicate a chromosomal abnormality, but it can also be a transient variant of normal development; NIPT is extremely reliable for trisomy 21, but it is not a diagnostic test and requires confirmation by invasive methods; even microarray and sequencing can yield findings of uncertain clinical significance. For this reason, decisions regarding further management must not be based on a single result alone. From both an

ethical and medical standpoint, it is justified to recommend that the pregnant woman and her partner seek additional consultation, whether with an experienced perinatologist, geneticist, or multidisciplinary team. Such an approach reduces the risk of wrong decisions and provides parents with a sense of security and trust. This represents an important ethical moment: recognizing the limits of one's own knowledge or methodological limitations and referring the patient for additional expert evaluation.

In all dilemmas that accompany prenatal diagnostics, the fundamental orientation must always be the pursuit of good. This applies not only to the individual, but also on several levels: the good of the pregnant woman, the good of the unborn child, the good of the family, and the good of the community as a whole. In practice, this means that the physician must evaluate not only medical data, but also the broader psychological, social, and moral context. Of utmost importance is high-quality, complete, and timely information. Only a well-informed pregnant woman, together with her partner, can make a decision that is truly autonomous and responsible. In this process, the responsibility of the physician is enormous, as the way findings and recommendations are presented can decisively shape the decision (22,23). If prenatal diagnostics leads to an early therapeutic intervention that saves the child's life, it is a clear example of achieving good. However, if a procedure carries a risk of greater fear, suffering, or the loss of a healthy child, then it is not consistent with the principle of good. The same applies to decisions that affect the entire family, since pregnancy outcomes shape not only the lives of the mother and child but also the lives of the partner, siblings, and even the wider community.

If only the negative aspect of a finding is emphasized, the pregnant woman may experience unnecessary fear and pressure, while on the other hand, simplified or overly reassuring interpretations may underestimate the real risk. Therefore, the physician finds themselves in a sensitive role as mediator between medical facts and the personal values of the family, where expertise must be united with compassion and ethical responsibility (24).

This dimension of communication represents a bridge between ethics and clinical practice. The way in which the physician conveys information and builds trust with the pregnant woman and her partner directly influences the reduction of ethical dilemmas and unnecessary fear.

Prenatal diagnostics does not end with making a diagnosis; it only then acquires its full meaning through communication between the physician and the pregnant woman, and her family. The manner in which information is transmitted decisively affects decision-making and shapes the overall pregnancy experience (9).

The physician is not only a technical executor of diagnostic procedures, but also a mediator between medical facts and the life decisions of parents. The decision of the pregnant woman and her family is primarily based on the information they receive from the physician, which makes their responsibility extremely significant. Information must be accurate, clear, and comprehensive, while it is also important to avoid suggestive or alarming formulations that could compromise the pregnant woman's autonomy in decision-making. It is equally necessary to emphasize the limitations of specific methods, and not only highlight their diagnostic power, so that parents gain a realistic picture of the value and reliability of the findings (25). The physician must always speak the truth: it is equally wrong to downplay the seriousness of the condition to "sweeten the situation" as it is to exaggerate the problem and present it as more serious than it actually is. Both approaches undermine trust and can lead to decisions that are not based on actual facts (26).

The physician must convey only those pieces of information of which they are completely certain. When there is doubt or uncertainty about the accuracy of findings or the diagnosis, this should be clearly emphasized and presented to the pregnant woman and her partner. In such cases, it is responsible

to recommend further diagnostic workup and the inclusion of other specialists, such as a clinical geneticist, fetal cardiologist, or neonatologist (27). This approach reduces the risk of wrong decisions and provides parents with confidence in the medical process.

Clinical experience shows that when confronted with an unfavorable prenatal finding, the pregnant woman is often unable to remember or transmit all the information provided by the physician. For this reason, it is advisable that the partner, and when necessary, other family members, participate in the communication. Their presence strengthens the sense of togetherness and shared responsibility, reduces the risk of misunderstandings or incomplete information, and facilitates decision-making that is crucial for the family's future (28, 29). Such an approach increases the woman's sense of security, since the burden of difficult information and decision-making is shared with a trusted person and close family.

An unfavorable prenatal finding does not affect only the medical dimension of pregnancy but also deeply impacts the emotional balance of the woman and her family. Fear, uncertainty, sadness, and feelings of guilt are common parental reactions to such information. Therefore, the physician must show empathy and understanding in communication, but also recognize when the emotional burden is so strong that it exceeds their professional competence. In such situations, psychological support specialists should be involved to provide comprehensive care and to enable parents to make decisions that are not only informed but also emotionally balanced (30).

Complex clinical situations, such as severe fetal malformations or suspected rare genetic syndromes, require collaboration among multiple specialists. In such circumstances, the process should involve a gynecologist, clinical geneticist, neonatologist, pediatric cardiologist, psychologist, and, if necessary, an ethicist. A multidisciplinary approach ensures greater professional safety, reduces the risk of wrong decisions, and provides parents with the feeling that their child and family are being cared for comprehensively and responsibly (31). Beyond raising the quality of medical decision-making, this model reduces the sense of isolation of the pregnant woman and her partner, since the decision is not left only to them and one physician, but is made within a team framework.

Ultimately, all ethical dilemmas and clinical uncertainties in prenatal diagnostics boil down to the relationship of trust between the physician and the patient. Trust is built on truthful and clearly conveyed information, the physician's willingness to admit the limits of their certainty, the inclusion of the partner and multidisciplinary team, and recognition of the family's emotional needs. When trust exists, prenatal diagnostics becomes a process that brings not only medical benefits but also human security and a sense of togetherness. Without trust, even the most sophisticated diagnostic procedures lose their value and may become a source of insecurity, fear, and irreversible wrong decisions (32).

## Ethical, Legal, Cultural, and Social Framework of Prenatal Diagnostics

Prenatal diagnostics does not take place in a vacuum, but within a broader social, legal, and cultural framework. Attitudes toward its purpose and limits differ significantly among countries and communities. While some emphasize the autonomy of the pregnant woman and her right to choose, others begin from the dignity of unborn life and highlight the obligation to protect the fetus. Understanding these differences is essential for a comprehensive assessment of ethical dilemmas.

In Catholic bioethical tradition, prenatal diagnostics is acceptable and justified when aimed at protecting the health and life of the mother and child, or when it helps prepare for therapeutic or palliative approaches (33). However, it is unacceptable if used as a tool for pregnancy selection and discrimination of the unborn based on sex, disability, or genetic traits. Catholic ethics emphasizes that the value of life does not depend on its "quality," but on the inherent dignity of the human person.

Secular bioethics primarily rests on the principle of the pregnant woman's autonomy and her right to decide on the course of pregnancy. In this context, fetal rights are not recognized to the same extent as maternal rights, with the emphasis placed on freedom of choice and informed decision making (9). In many health systems, prenatal diagnostics is also considered from a public health perspective to reduce the incidence of severe malformations and genetic diseases. However, this approach may raise the question of the boundary between legitimate care and covert eugenics.

Furthermore, the legal regulation of prenatal diagnostics and pregnancy termination varies greatly: from liberal systems (e.g., the Netherlands, Sweden), where termination is permitted until late gestational weeks, especially in cases of severe fetal malformations (34); to restrictive systems (e.g., Poland, Malta), where termination is allowed only in exceptional circumstances, such as threats to the mother's life (35).

These differences directly shape everyday clinical practice, since the availability of prenatal methods becomes meaningless if the legal framework does not allow decisions resulting from diagnostic findings.

Cultural factors strongly influence perceptions of prenatal diagnostics. For example, in some Asian countries, there is the problem of sex-selective abortions, while in Western societies, concern is growing about "quality-of-life screening" and the possible stigmatization of people with disabilities (36). In cultures that emphasize family values, pregnancy decisions are more often made collectively, involving the partner and extended family, whereas in individualistic cultures, the emphasis remains on the personal autonomy of the pregnant woman (37).

Ethical questions and dilemmas during the prenatal period cannot be limited only to the moment of diagnosis and the decision on the course of pregnancy. Equally important is the question of what kind of support society provides to families who decide to accept a child with disabilities. Parental decisions are often influenced by perceptions of the quality of life of the child and family, which are in turn shaped by the availability of social resources and the level of solidarity within the community (38).

Examples of good practice include prenatal hospices, which offer palliative care and psychological support to parents facing life-limiting diagnoses (39). These models allow pregnancy to be completed with dignity, without the feeling that termination is the only option. Furthermore, society can significantly contribute to the quality of life of children with disabilities and their families by ensuring parental rights and benefits, access to specialized kindergartens and schools, adapted public transportation and infrastructure, and systematic psychological and social support (40).

When society provides such forms of support, parents are more likely to continue the pregnancy and accept a child with disabilities, as they feel they will not be left alone to face the challenges. In this way, prenatal diagnostics retains its original purpose—to help in life planning and care, rather than becoming a mechanism of selection (41).

## Conclusion

Prenatal diagnostics is one of the most dynamic areas of modern medicine. Its development brings invaluable benefits for maternal and child health, enables early recognition of malformations, timely planning of delivery in tertiary centers, and even intrauterine therapeutic procedures that significantly improve outcomes. However, these same diagnostic tools also open complex ethical and social issues: from confronting the possibility of pregnancy termination to the dangers of covert eugenics, commercialization of testing, and the deepening of social inequalities.

All ethical dilemmas can be viewed through the four fundamental principles of medical ethics – autonomy, beneficence, non-maleficence, and justice. Autonomy requires that the pregnant woman and her family receive truthful, complete, and clearly

explained information in order for decisions to be free and responsible. Beneficence obliges the physician not only to technical expertise but also to providing support, empathy, and acceptance. Non-maleficence reminds us that no method should bring greater psychological or medical harm than benefit, especially in the context of false-positive results or commercialized testing. Justice demands equal access to modern methods for all pregnant women, regardless of their socioeconomic status, as well as respect for the equal dignity of every unborn child, without discrimination based on sex, disability, or genetic traits.

One of the central questions remains the boundary between legitimate care and covert eugenics. When prenatal diagnostics serves to improve health outcomes and plan therapy, it is ethically justified. But when it results in selective terminations due to disability or sex, it becomes a tool of discrimination and social pressure. The same applies to the rapid technological progress in genome sequencing and artificial intelligence: while it promises more precise diagnostics, it also raises new questions about algorithm reliability, predictive genetics, and the very notion of human identity.

The future of prenatal diagnostics will therefore depend not only on technological progress but also on the responsibility of society. If the community ensures quality living conditions, adequate health care, social support, and inclusive education for families with children with special needs, the perception that termination is the only option will diminish. In this way, society becomes not just a passive observer of ethical positions, but their active shaper.

The physician's role in this context remains crucial. They are not only a diagnostician but also a companion to the family, a guardian of trust, and the one whose manner of communication can empower parents to make decisions in accordance with their values.

In conclusion, we face questions to which medicine and society must yet provide clear answers: how to prevent the misuse of prenatal diagnostics for discrimination, how to ensure equal access to modern methods, how to set boundaries between medically justified procedures and positive eugenics, and how to reconcile technological progress with the dignity of human life. The answers to these questions concern not only the individual but also shape the future of families and society as a whole.

Only if prenatal diagnostics remains in the service of life and dignity will its development be fully justified. And this requires ongoing dialogue between medicine, ethics, and society, directed toward the well-being of families with children with disabilities, since their integration and support represent a measure of the humanity and maturity of every community.

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# Re-envisioning Autonomy from a Confucian Viewpoint

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## Abstract

**Background:** Beauchamp and Childress' principle of respect for autonomy has been criticised by scholars for privileging individualism due to its Anglo-American ('Western') origin and orientation. Consequently, researchers in clinical ethics need to consider alternative normative models and culturally diverse approaches to autonomy.

**Aim:** Guided by philosophical inquiry, this paper seeks to re-envision the concept of autonomy in biomedical contexts by focusing on the contributions of Confucian perspectives to its understanding and application in clinical contexts.

**Methods:** The research methodology is philosophical inquiry based on a textual analysis of the *Analects* (*Lunyu*), which records the teachings and conduct of Confucius. This methodology includes philosophical retrieval, which reviews and analyses key concepts and assumptions in classical texts, and philosophical reconstruction, which applies ancient ideas to contemporary issues.

**Results:** The textual analysis of the *Analects* reveals that Confucius' notion of autonomy is relational, embodied, and authentic. Rather than 'self-rule', Confucius' interpretation of autonomy advocates 'selves-rule' by harmonising interdependence, mind-body integration, and moral self-cultivation. What makes Confucius' relational autonomy unique is its emphasis on morality, particularly the all-encompassing virtue of *ren* (an achieved state of humanity).

**Conclusion:** A major implication of Confucian ideas in clinical settings is the need to respect and consider the consent of patients as well as that of their family members based on the value of *ren* (an achieved state of humanity). Confronted with complex ethical dilemmas, especially in clinical scenarios, medical professionals need to recognise that the autonomy of an individual is intrinsically tied to that of their family and inseparable from pre-existing ethical commitments. In other words, medical professionals should be mindful of the relational, embodied, and authentic aspects of autonomy by giving balanced recognition to both patient autonomy and shared decision-making, which contributes to the realisation of *ren*. Confucian bioethics converges with Christian bioethics by underscoring the relational dimension of autonomy, especially in settings involving family, healthcare professionals, and the patient.

**Keywords:** autonomy, Confucius, interdependence, mind-body integration, *ren*, self-cultivation

## Introduction

Although there is a variety of definitions and approaches to autonomy in the extant literature, Beauchamp and Childress's bioethical framework is "probably the most popular one in biomedical ethics today", having exerted an unprecedented impact on both academics and practitioners (1). Beauchamp and Childress write that an autonomous action occurs when normal choosers act in accordance with three conditions: 1) intentionally, 2) with understanding, and 3) without controlling influences that determine their action (2). However, their principle of respect for autonomy has been criticised by scholars for privileging individualism due to its Anglo-American ('Western') origin and orientation. A representative critique is the assertion that Beauchamp and Childress's principles "are derived from and aligned with considered judgments rooted in modern Western liberal culture" (3). It is therefore important for researchers in clinical ethics to consider alternative normative models of and approaches to autonomy across cultures. This study focuses on Confucius' perspectives as "Confucian philosophy has long been a representative of the East Asian cultural tradition" (4). Although Confucius did not directly discuss medical ethics, his views are pertinent to a re-envisioning of autonomy in the clinical setting.

## Materials and methods

This paper aims to provide a conceptual alternative to the prevailing capacity-centred approaches by outlining a Confucian viewpoint. The research methodology is philosophical inquiry based on a textual analysis of the *Analects* (*Lunyu*), which records the teachings and conduct of Confucius. The research methodology of philosophical inquiry comprises philosophical retrieval and philosophical reconstruction (5). Philosophical retrieval seeks to review, shed light on, and analyse key concepts, theories, and presuppositions with respect to one or more classical texts. Philosophical reconstruction, on the other hand, is geared towards applying ancient intellectual ideas and practices to modern issues and challenges. Guided by philosophical inquiry, this article argues that Confucius' concept of autonomy is characterised by interdependence, mind-body integration, and moral self-cultivation. At the same time, a Confucian understanding of autonomy is compatible with Beauchamp and Childress's conditions of intentionality, understanding, and non-control. However, what makes a Confucian approach to autonomy distinctive is its emphasis on relationships and interdependence. Rather than approaching autonomy as 'self-rule', Confucius values relational autonomy and 'selves-rule'.

This article begins with a Confucian formulation based on the thought of Confucius, contending that Confucius' concept of autonomy is marked by interdependence, mind-body integration, and moral self-cultivation. The next segment highlights the clinical implications arising from the preceding discussion.

## Results

### Confucius on Beauchamp and Childress' three conditions of autonomous actions

The etymology of 'autonomy' is self-rule, which implies the capability of individuals to deliberate and make their own decisions. Beauchamp concludes, "The starting point for an account of autonomy is self-rule free of controlling interferences by others and freedom from limitations within the individual that prevent choice" (6). Researchers have noted that the "dominant, individualistic understanding of autonomy that features in clinical practice and research is underpinned by the idea that people are, in their ideal form, independent, self-interested and rational gain-maximising decision-makers" (7). Rather than 'self-rule', Confucius' interpretation of autonomy upholds 'selves-rule' which reflects relational autonomy. This section explicates Confucius' understanding and demonstration of relational autonomy as recorded in the *Analects* (*Lunyu*). His notion of autonomy consists of three essential characteristics: interdependence, mind-body

integration, and moral self-cultivation.

Regarding the first characteristic of interdependence, Confucius situates personal autonomy within a community of interconnected and mutually reliant moral agents. Confucius points to a symbiotic relationship between helping oneself and helping others: "In helping oneself take a stand, one helps others to take their stand; in desiring to reach a goal, one helps others to reach their goal" (6.30; all passages are taken from the *Analects* and translated by the first author). Confucius' point is that the interests and well-being of a person cannot be detached from those of other people (8). In this regard, a Confucian viewpoint echoes Lewis' observation that "it is increasingly evident that a relational understanding of autonomy is necessary to address narrow reductionist views of autonomy that underpin legal frameworks, specifically, a relational understanding that acknowledges the myriad ways in which social, contextual, and situational factors—including legal frameworks themselves—causally interact with, shape, and undermine autonomous agency" (9). Instead of independence, relational autonomy emphasises interdependence, recognising that individuals live, thrive, make decisions and develop their identities within social environments and human relationships (7). In short, Confucius regards human beings not as individualistic and atomistic but as social beings situated within a community. Confucius' construct of autonomy exemplifies relational interdependence, highlighting human interdependence, social interplays, and cultural factors that shape a person's identity, agency, and decision-making.

The second aspect of Confucius' understanding of autonomy is that it reflects mind-body integration. Rejecting the mind-body divide, Lewis writes,

Work is starting to emerge in medical ethics that challenges the separation of mind and body in accounts of autonomy and argues that the body is not only integral to the self's meaningful experience in and of the world but also to the process of exercising one's autonomy in medical decision-making situations (9).

Instead of Cartesian dualism, Confucius stresses the integration of both through his notions of 'heart-mind' (*xin*) and 'ritual propriety' (*li*). He articulates, "At seventy I could follow my heart-mind's desires without overstepping the line" (2.4). The term 'heart-mind' denotes the site where cognitive and affective faculties are synthesised: to follow one's heart-mind is to act in accordance with how one thinks and feels. The expression 'overstepping the line' refers to crossing moral boundaries by doing what is unethical. Complementing the heart-mind is Confucius' concept of ritual propriety (*li*), which denotes normative behaviour that originates from and is motivated by humane values, thought, attitudes, and dispositions. Examples of ritual propriety include: not imposing upon others what you yourself do not desire (12.2), keeping one's word (15.6), and building relationships with others (13.19). It follows from the preceding section that ethical actions alone are insufficient in the Confucian traditions. For Confucius, morality should stem from one's cognitive awareness of and emotional resonance with what is right, thereby leading to virtuous conduct.

Complementing the interdependent and embodied characteristics of Confucius' formulation of autonomy is its emphasis on moral self-cultivation. The Confucian scholar Tu Wei-ming explains that Confucian self-cultivation is an "independent, autonomous and inner-directed process" centering on "knowing oneself internally is the precondition for doing things right in the external world" (10). Confucius stresses self-cultivation by highlighting the primacy of self-effort and authenticity. In his words, "human beings are similar in their nature, but differ as a result of their practice" (17.2). Confucius models self-cultivation by setting his heart-mind on learning at fifteen (2.4) and is described as insatiable in learning and application (7.2). Confucian self-cultivation involves the unity of one's cognitive, affective, and behavioural domains, as it is not solely an intellectual process. Rather, self-cultivation is an authentic process of self-actualisation, in which a learner channels one's thinking and feelings towards morally excellent conduct. The focus on self-cultivation in Confucius'

interpretation of autonomy emphasises autonomy as authentic selfhood. Moral self-cultivation, in short, enables a person to live out their true self, which comprises "those stable, core attributes—values, traits, and dispositions—that consistently define who a person is across time and circumstance" (10).

Overall, Confucius' approach to autonomy pivots on 'selves-rule', which is a notion of relational autonomy that harmonises interdependence, mind-body integration, and self-cultivation. Furthermore, what makes Confucius' relational autonomy unique is its focus on morality, particularly the all-encompassing virtue of *ren* (an achieved state of humanity). *Ren* has been variously rendered as compassion, kindness, benevolence, love, human-heartedness, and goodness, among others. Pertinently, *ren* 仁 has the same pronunciation as 'human being' 人 (also written as *ren*). The similarity between *ren* (an achieved state of humanity) and *ren* (human being) indicates that the former signifies not just any person, but the ideal human being who is authentic, fully human, and perfectly realised. It is therefore appropriate to understand *ren* as "an achieved state of humanity manifested as a signatory feature of all one's behaviours and identified as a source of admiration from and inspiration for one's community" (11). In the remainder of this paper, we have translated *ren* as "an achieved state of humanity" for brevity.

It follows from the description of *ren* as the paradigmatic person that *ren* is necessarily moral in essence. Confucius relates ritual propriety to *ren* by positing, "If a person can restrain oneself and return to ritual propriety (*li*) for one day, the whole world would regard such a person as *ren* (12.1). A person who has attained *ren* exemplifies bodily intentionality through the integration of thought, emotions, and actions. *Ren* is also inherently interpersonal, as indicated by its Chines character 仁, which is comprised of 'person' 人 and 'two' 二. *Ren* evokes interdependence, which is a feature of Confucius' idea of autonomy. A *ren* person exercises their autonomy not in isolation but within interpersonal contexts. Relational autonomy emphasises "how our choices are situated socioculturally, as well as the interdependence that allows us to fulfil (or not) our autonomy" (12). In the medical setting, the scope of *ren* transcends one's immediate family to include medical professionals who are part of the extended family of humanity. The attainment and sustenance of *ren* in the form of medical care, kindness, and empathy cannot be realised without the expertise, humaneness, and relationship of healthcare professionals. To summarise, the participation of doctors and other medical professionals, as well as their collaboration with the patients and their family members, is critical to the overall well-being of patients.

## Discussion: A Case Study

The foregoing paragraphs have put forward the claim that Confucius' concept of autonomy revolves around interdependence, mind-body integration, and moral self-cultivation. A key implication of Confucian ideas in medical settings is the need to move beyond personal autonomy to promote shared decision-making that reflects the Confucian value of *ren* (an achieved state of humanity). The Confucian notion of autonomy broadens the dominant conception of autonomy as primarily cognitive, individualistic, and unrelated to authentic selfhood in clinical contexts. What follows from a Confucian conceptualisation of rational autonomy is the need to respect and consider the consent of patients as well as those of their family members based on the value of *ren*.

Following the interpretation of *ren* as the attainment of an achieved state of humanity by being a source of admiration from and inspiration for one's community, medical decision-making is a fully shared one, i.e., it does not reside with the individual patient only and instead is a collaborative effort involving the individual's family members. Confronted with complex ethical dilemmas, especially in clinical scenarios, medical professionals need to recognise that the autonomy of an individual is intrinsically tied to that of their family and inseparable from pre-existing ethical commitments. In

other words, medical professionals should be mindful of the relational, embodied, and authentic aspects of autonomy by giving balanced recognition to both patient autonomy and shared decision-making that contributes to the realisation of *ren*. To illustrate the application of Confucius' construct of autonomy, it is instructive to turn to an example involving a Chinese patient:

An 80-year-old patient suffered from a cerebral haemorrhage and fell, with the Glasgow Coma Scale dropping to 3. He had previously expressed that if anything were ever to happen to him, where a full recovery was in doubt, he wished to pass away peacefully without any effort to keep him alive. The family was aware of his wish, but his 73-year-old wife refused to give up and said she was still young, healthy, and willing to look after him even if he became vegetative. She said that she would follow him if he were allowed to die. The family decided that efforts should be made to rescue him because his existence gave meaning to his wife and children. This old man was kept alive for his family's sake (13).

A GCS score of 3 indicates severe brain injury and a deep coma, with an inferior prognosis for meaningful recovery. The patient has previously stated that he does not wish to be resuscitated when full recovery is in doubt, and his current presentation fits precisely within those criteria. We can analyse this case study from both Western bioethical and Confucian perspectives.

Beauchamp and Childress' principle of respect for autonomy suggests that if the patient's wishes were properly documented and verifiable, a practitioner would typically be legally and ethically obligated to respect them. The family has no authority to override his decision, regardless of their emotional attachment or disagreement with it. Consistent with Beauchamp and Childress' principle of respect for autonomy, performing life-sustaining treatment via mechanical ventilation or artificial nutrition and hydration would be considered an assault on the patient, who has not consented to the treatment. The only circumstances in which a practitioner may override a patient's expressed wishes are if there is any evidence that the patient lacked decision-making capacity at the time that the statement was made. Examples might include cases of delirium or coercion. Otherwise, the principle of self-determination would deem that keeping the man alive against his wishes is a direct violation of his autonomy.

Conversely, a Confucian perspective offers a more nuanced approach. Autonomy is not an isolated exercise of individual choice; rather, it is relational and deeply intertwined with familial and social roles. Nevertheless, the Confucian emphasis on human interdependence and family bonds does not automatically justify the overriding of a patient's wishes and decisions. Further insights into the above case study can be gained by analysing it based on the relational, embodied, and authentic traits of Confucius' interpretation of autonomy. First, relational interdependencies are manifested through the strong bonds and connectedness displayed by the family members of the patient. It is noted that the shared family decision to keep the patient alive was made on the basis that "his existence gave meaning to his wife and children" and that he was "kept alive for his family's sake".

It is clear that he had enjoyed a warm and supportive relationship with his wife and children, which accounts for their unwillingness to let him die. A Confucian advocate may therefore argue that the family's insistence on keeping the man alive does not undermine his autonomy, but simply expresses it in its relational form. By following the family's wishes, the practitioner is ultimately respecting the patient's autonomy, which is defined by interdependence and family harmony rather than isolated self-rule. However, the family's decision to keep him alive "for his family's sake" contradicts his expressed wish to pass on peacefully without any effort to keep him alive. It is noted in the example that the family, including his wife, was aware of his wish.

What is less clear, however, is how the family members responded to his wish. If they had reacted by agreeing with him and assured

him that they would carry out his wish, then the family's decision to keep him alive would have violated his autonomy and contradicted the value of *ren*. As noted earlier, *ren* involves the moral cultivation of everyone to become the ideal person who is a source of admiration and inspiration for their community. In this case, it appears that the sole purpose of keeping the patient alive is that "his existence gave meaning to his wife and children". However, this decision to treat the man as a means to an end clashes with the compassion, empathy, and kindness proceeding from *ren*. Instead of interdependence, the family has made the decision *independently* of the man whose wish was overridden. Overall, the family's act of overriding the man's wish goes against Confucius' idea of relational autonomy, which involves shared decision-making that respects and considers the desires and aspirations of all parties.

The second characteristic of embodied experience for Confucian autonomy is also relevant to the case study. Although the family may not justified in deciding to keep the man alive, it is apparent that they are motivated by their genuine love and care for him. Although the patient is unconscious and unresponsive, his bodily presence is evidently treasured by and significant to the family members. His wife is so attached to him that she threatens that she "would follow him, if he were allowed to die". It is therefore crucial for medical professionals to consider the emotional and physical states of the family members by acknowledging their feelings and responses. The goal of Confucian mind-body integration is the attainment of humaneness (*ren*), as noted earlier. The family decision to keep the patient alive is grounded in the virtues of family love, togetherness, and sacrifice.

Finally, the quality of authenticity for Confucian autonomy is also salient for this case study. As explained earlier, moral self-cultivation is a creative process involving authentic moral motivation and self-actualisation. Individuals engaging in moral self-cultivation experience inner joy and spontaneous ease through aligning their heart-mind with *ren* and conducting themselves in accordance with ritual propriety (*li*). In this case, moral self-cultivation does not apply to the patient since he is in a comatose state. Rather, it pertains to his family members, who need to consider the moral dimensions and implications of their decision.

On the one hand, the family demonstrates the virtue of *ren* through their love for the patient. They wish to preserve the family bonds, particularly so that the wife can continue to care for her husband. From a Confucian perspective, familial love or what Confucius calls filial piety, is the starting point of moral cultivation. Arguing that filial piety is the root of *ren*, Confucius states that "the *junzi* (exemplary person) is affectionately committed to their parents" (8.2). The central role of the family in ethical development explains why Confucian researchers call for family consent instead of individual consent (14). As a researcher puts it, the "principle of autonomy (i.e., the idea of individual informed consent), however, does need to be revised to make it compatible with alternatives such as family- or community-informed consent" (15). On the other hand, the flagrant violation of the man's explicit wish makes it difficult for the family members to be seen as a source of admiration and inspiration for their community, which is what *ren* is about.

## Confucian and Christian Bioethics

It needs to be clarified that this study's focus on Beauchamp and Childress' principle of respect for autonomy does not mean that their ideas are the only bioethical framework or approach in the Anglo-American contexts. In other words, this article does not subscribe to a reductionist view of Western bioethics by equating it with Beauchamp and Childress' principlism while ignoring other major traditions in the Western bioethical discourses. One such tradition that upholds the relational dimension of autonomy is Christian bioethics. Although much can be said about Christian perspectives on autonomy and medical ethics, it is beyond the scope of this essay to engage in a detailed exposition of Christian bioethics and its

similarities with Confucian bioethics. Suffice it to say that both traditions underscore the relational dimension of autonomy, especially in settings involving family, healthcare professionals, and the patient.

A Christian value that parallels the Confucian virtue of *ren* is love or charity, which goes beyond the formalistic acknowledgement of the rights to autonomy to advocate for whole-hearted, altruistic acts towards fellow human beings (16). A Christian doctor is "a servant to the suffering ones and a brother to the sick brothers of Christ" (17). Relatedly, Christian bioethics also shares the Confucian focus on moral self-cultivation: a Christian physician serves others sincerely from the heart, thereby bearing witness to their ethical character (18). In congruence with the Confucian stress on mind-body integration, Christian doctors are exhorted to regard each individual as a unified whole comprising the spirit, soul, and body. Far from being atomistic and pre-social, a person is a relational being with God and other human beings. Edmund D. Pellegrino, who was a key founder of modern bioethics, highlights the communal component of the Christian bioethical worldview, which bears striking similarities to a Confucian worldview:

A Christian perspective also buffers the strong individualistic trend present in much of contemporary biomedical ethics. Christianity is community-centred. It eschews the moral atomism of the libertarian or the absolutist interpretation of patient autonomy. Patient and physician are bonded to each other and to the larger community of others in need. The sick remain members of the Christian community with a special claim on the community's solicitude (18).

The 'community-centred' characteristic of Christianity means that Christian doctors should practise 'selves-rule' through shared decision-making among the doctor, patient, and family members based on charity. With respect to the case study discussed earlier, Christian bioethics does not view the provision of artificial nutrition and hydration as an assault on the patient who had not consented to the treatment. Manifesting the Christian value of charity, all healthcare professionals have a duty to provide hydration and nutrition to patients, unless such life-sustaining measures increase suffering, become excessive, and result in dysthanasia. Christian bioethics teaches that doctors should respect the patient's autonomy not unconditionally, but within ethical limits and anchored in the value of human dignity (19). Christian bioethics also agrees with the Confucian objection that the patient's wish to pass on should not be overridden purely for the sake of the family members.

Overall, Christian and Confucian bioethics converge on respecting patient autonomy within an interdependent, holistic, and moral framework. Ultimately, the Christian doctor's professional judgment should be guided by what is good for the patient, reflecting relational autonomy.

## Conclusion

Researchers have consistently stressed the importance of avoiding ethnocentrism and acknowledging varied cultural perspectives in medical ethics. Noting that "bioethics is a Western product", scholars have advocated for Asians to "develop a concept of bioethics based on their traditional cultures" (20). A researcher maintains the need for a conception of autonomy to acknowledge inter-relationships and community that pervade non-Western cultures, such as those in Asia and Africa (21). We contend that Confucius' approach to autonomy manifests the fundamental attributes of interdependence, mind-body integration, and moral self-cultivation - the relational, embodied, and authentic dimensions of autonomy. We also elaborate on how Confucian viewpoints on autonomy advocate for the respect and consideration of the autonomy and consent of patients as well as their family members on the basis of *ren* (an achieved state of humanity). It is hoped that our discussion will open the door for more cross-cultural and intercultural dialogues and novel conceptions regarding autonomy in the medical context.

## Declarations

**Acknowledgments:** We are grateful to two anonymous reviewers for their helpful feedback on an earlier draft.

**Authors contributions:** The first author conceptualised the topic, conducted research, and drafted the manuscript. The second author gave inputs and co-drafted the manuscript.

**Ethics considerations:** This is a theoretical paper that does not involve human participants and/or animals.

**Funding:** This study received no external funding.

**Competing interests:** No potential competing interest was reported by the authors.

**Data sharing statement:** Data sharing is not applicable to this article as no new data were created or analysed in this study.

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- Introduction
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- Results
- Discussion
- Conclusion
- Acknowledgments
- Declarations
- References
- Tables (one table per page)
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Issue a statement that the study has obtained ethics approval, including the name of the ethics committee(s), the official number of the document, as well as a statement that the participants had given their prior informed consent. If ethics approval was not required, this must be stated and explained.

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- Organization/institution can be listed as author if no individual authors are specified; no et al. is used in that case.
- Plain text, no italics.

Title:

- Use sentence case (capitalize only the first word and proper nouns or acronyms).
- Plain text, no italics.

Type / Medium:

- Specify the Type / Medium (e.g., [Internet])
- Use square brackets, following the title.
- Plain text, no italics.

Year / Access Date:

- Year of publication.
- [cited YYYY Mon DD] if the page may change over time. Optional if the page is static.
- Plain text, no italics.

URL:

- Full URL after "Available from:"
- Plain text, no italics.
- Do not place a period after a URL (a link).

Example References – Internet Sources

1. Reference with individual authors

Author A, Author B. Title [Internet]. 2023. Available from: https://www.example.com

2. Reference with an organization as author

Name of Organization. Title [Internet]. 2023. Available from: https://www.example.com

3. If the page may change over time, include access date

Name of Organization. Title [Internet]. 2023 [cited 2025 Nov 10]. Available from: https://www.example.com

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