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Front Pages

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The *Athens Journal of Demography & Anthropology* (AJDA) is an Open Access quarterly double-blind peer reviewed journal and considers papers from all areas of psychology. Many of the papers published in this journal have been presented at the various conferences sponsored by the Languages & Linguistics Unit and the Literature Unit of the **Athens Institute for Education and Research (ATINER)**. All papers are subject to ATINER's Publication Ethical Policy and Statement.

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The current issue is the third of the first volume of the *Demography & Anthropology* (AJDA), by the published by the **Literature Unit** of the **Athens Institute**. All papers are subject to Athens Institute's Publication Ethical Policy and Statement.

Gregory T. Papanikos
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- Submission of Paper: **8 June 2026**

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- **Dr. Stamos Metzidakis**, Head, Literature Research Unit, Athens Institute & Emeritus Professor of French and Comparative Literature, Washington University in Saint Louis, USA.

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Athens Journal of Demography & Anthropology –
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Greek in Diaspora

*By Maria Irini Avgoulas**

This qualitative study examines the experiences of Greek diaspora communities in Melbourne, Australia, focusing on the intersection of religious identity, cultural maintenance, and health beliefs across three generations. Through in-depth interviews with immigrant, first-generation, and second-generation Greek Australians, this research explores how Greek Orthodox religion serves as a central pillar of identity and wellbeing, even as other cultural markers undergo transformation. The findings reveal that while participants experience conflicted identities regarding food practices, language use, and cultural belonging, religious belief remains a unanimous and unifying force. This study contributes to understanding how diaspora communities navigate cultural transmission, acculturation, and the maintenance of ethnic identity in multicultural contexts, with particular attention to the role of religion as a source of resilience and health promotion.

Keywords: *Greek diaspora, Greek Orthodox religion, intergenerational transmission, cultural identity, health beliefs, Melbourne, acculturation*

Introduction

The Greek diaspora represents one of the most significant migration communities in Australia, with Melbourne hosting one of the largest Greek populations outside of Greece. Understanding how diaspora communities maintain cultural identity while adapting to new environments remains a central concern in migration studies, anthropology, and public health. This paper examines three interconnected dimensions of the Greek diaspora experience in Melbourne: immigration and adaptation, identity formation and maintenance, and concepts of wellbeing and health.

Previous research has established that religion plays a crucial role in immigrant adaptation and mental health (Pargament and Cummings 2010, Koenig 2007). For Greek communities specifically, the Greek Orthodox Church has historically served not only as a religious institution but as a cultural anchor and social support network (Avgoulas and Fanany 2012a, 2013, Tamis 2005). However, questions remain about how the significance of religion and other cultural markers evolve across generations, and how these elements contribute to health and wellbeing in the diaspora context.

This study addresses these questions by examining the lived experiences of three generations of Greek Australians in Melbourne, with particular attention to how they conceptualize health, maintain cultural practices, and navigate their identity in the Australian multicultural landscape.

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Literature Review

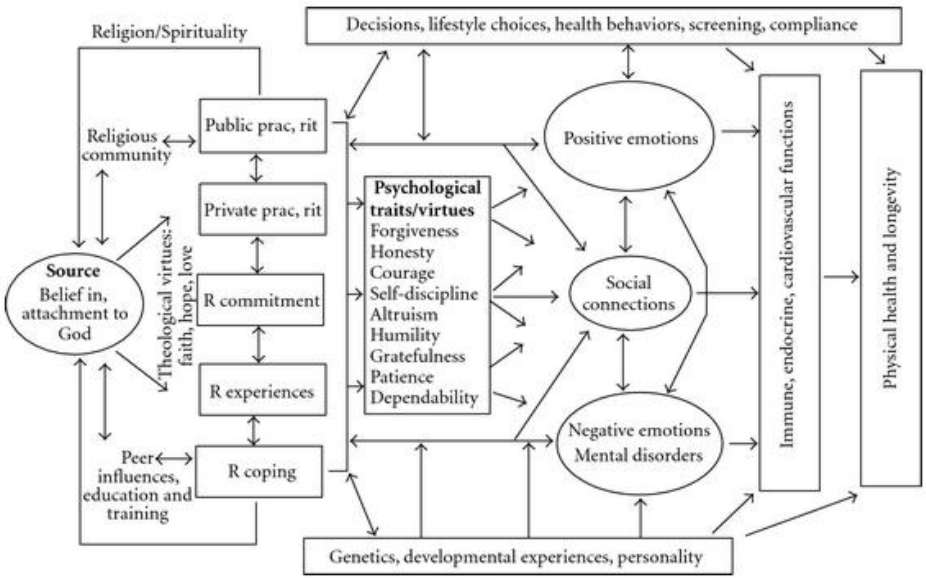
Religion, Health, and Wellbeing

The Greek Orthodox religion is very important to Greeks. Much has been written about the topic of religion for health and wellbeing in general-examples can be found in the literature (Pargament and Cummings 2010, Koenig 2007, Pargament 1997, Avgoulas and Fanany 2015, and many others).

Generally, what the literature suggests (Avgoulas and Fanany 2012a, Burch 2008, Cole et al. 2009, Geertz, 1973) is the positive nature of Greek culture, which has strong foundations in the Greek Orthodox religion. What we see is that religion provides an explanation for events that have occurred across different life experiences (Park and Folkman 1997 Murphy et al. 2003). One example in the Greek community is the church and the many miracles and the strength that prayer provides (Prado et al. 2004, Friedman et al. 2006. Pargament and Cummings 2010, Avgoulas and Fanany 2012a, 2012b, 2013).

The models of health that are most dominant and often discussed in the literature can be categorized as biopsychosocial, ecological, or social. However, many of these models do not account for the central importance of religion in individual health. An exception to this is a model (Figure 1) that was previously introduced by Koenig, King, and Carson (2012) and has direct relevance to the Greek community of Melbourne.

Figure 1. *Model of the Relationship between Religion and Health (Koenig, King and Carson, 2012)*



Cultural Transmission and Identity in Diaspora

Language plays a central role in the process of cultural maintenance and is also a marker of identity (Pauwels 2005, Borland 2006). For diaspora communities, the retention of heritage language represents both a practical means of communication and a symbolic connection to homeland and ancestry (Smolicz et al. 2001).

Cultural identity in diaspora contexts is often characterized by negotiation and hybridity, particularly across generations (Berry and Kim, 1988m Lopez-Class et al. 2011). Research on Greek Australian youth has documented the complexity of identity formation, with young people experiencing tensions between Greek and Australian identities (Tsolidis and Pollard 2009, 2010, Authers 2006).

Food, Health Beliefs, and Traditional Practices

Traditional Greek dietary patterns and health beliefs represent another domain of cultural maintenance. Previous research has documented the health meanings and practices among older Greek immigrants, noting the significance of traditional foods and preparation methods (Rosenbaum 1991, Mariño et al. 2002). These practices are often transmitted intergenerationally, though with varying degrees of adoption and adaptation (Avgoulas and Fanany 2012a).

Methodology

This qualitative study employed in-depth semi-structured interviews with members of the Greek community in Melbourne, Australia. Participants were recruited from three generational cohorts: immigrants (born in Greece), first generation (children of immigrants, born in Australia), and second generation (grandchildren of immigrants).

Participants

What was found in regard to formal education was that the immigrant generation had little or no formal education, whereas the Australian-born participants were all highly educated. A majority of the first generation (63%) had a university degree, while the second-generation participants were completing high school or had begun university study.

Data Analysis

Interview transcripts were analyzed using thematic analysis, focusing on emergent themes related to religious identity, cultural practices, health beliefs, and intergenerational transmission. Quotes presented in this paper have been selected to illustrate key themes across all three generations.

Findings

The Centrality of Greek Orthodox Religion

What it was found from the various research studies were four core elements that were transmitted between generations: culture, Orthodox religion, Greek food, and the Greek language. What I want to emphasize is that of all of them, the most important was the Orthodox religion.

Religion as Strength and Community

Words from the immigrants that explain it better:

> *"For me our Greek religion is a strength, a companion, a support. That's how my parents raised me and it's one of the many things I brought from Greece."*
> *"When the Priest speaks on Sunday at Church-he guides us with his words and for me these words give me peace and joy."*

On this topic, a first-generation immigrant told me:

> *"It is very important for me and my children to receive Holy Communion often."*
> And on this topic, second generation immigrants told me:
> *"Prayer gives me strength and having a saint to pray to gives you extra strength and support."*
> *"We go to the doctor generally but prayer also helps-I prayed for my grandmother when she was sick."*

Religious Practices and Health Integration

These narratives reveal how Greek Orthodox religious practices are understood not merely as spiritual obligations but as integral components of health and wellbeing. Prayer, church attendance, and sacraments like Holy Communion are described as sources of strength, peace, and healing that complement rather than replace biomedical healthcare.

Contested Identities: Food, Language, and Belonging

While agreement on the significance of religious belief and its value to them in terms of personal resilience and membership in the Greek community was unanimous, the participants expressed a conflicted sense of identity in the other three domains. Below are some quotes from all generations that elucidate this.

Immigrant Generation: Nostalgia and Loss

Immigrant generation:

> *"In Greece where I grew up I had my own garden-yard."*
> *"We didn't have much growing up in Greece-we ate lots of legumes and rarely meat. But we were happier and healthier-than now when we have everything, we eat meat almost every day and we're not well."*

"In Greece I had a very large garden with lots of fresh vegetables-I have a garden here too, you see, the garden reminds me of Greece and Greek soil."
"As much as I can, I cook Greek food."
"At this age what is good and I prefer are legumes-and especially lentils but the children don't like them."

These narratives from immigrant participants reveal a nostalgic longing for the simplicity and perceived health benefits of their traditional Greek lifestyle. Gardens emerge as particularly powerful symbols-physical spaces that connect them to homeland, traditional foodways, and memories of a healthier past.

First Generation: Inherited Wisdom and Observed Change

First generation:

"My mother always told me to eat well-the best foods she told me are greens and legumes and to eat very little meat she told me. That's what I grew up with she told me."
"In the old days there weren't so many illnesses-and especially childhood ones, there weren't as many as now. It was the food, in the old days we ate better. More from home and very rarely from outside."
"I remember when I was growing up my parents always had a garden-I especially remember my father was always there. My parents told me it reminded them of the village and Greece when they were growing up."

First-generation participants demonstrate an awareness of their parents' traditional knowledge while simultaneously observing differences between past and present health patterns. They serve as a bridge generation, having received direct transmission of traditional practices while living fully in the Australian context.

Second Generation: Critical Consciousness and Selective Tradition

Second generation:

"Processed food is bad for our health, all the chemicals, why are apples so big now? Apples from the tree are smaller compared to the ones from the supermarket. The growth hormones they did not have them then and that's the reason we have more illness today that we didn't have then in my grandmother's time. Best example my grandmother grew up in a tobacco farm, their tobacco was all natural, it wasn't addictive; it was still bad for your lungs, but not that bad, and there weren't all those chemicals. It was not addictive; you only smoked it because it was a pastime thing, a social thing. Now cigarettes are one of the worst things you can put in your body."
"My grandparents always had a garden, lemon tree and lots of flowers. Like Greece they told me-it's tradition and our culture they told me."

Second-generation participants articulate a sophisticated critique of modern food systems while valorizing traditional practices. Notably, they frame this not primarily in ethnic terms but in broader health and environmental discourse, suggesting a universalization of what they learned as Greek cultural practices.

Acculturation and the "Greek Way" vs. "Australian Way"

What we can see from the data is that the Greek way was a strong perception particularly for the elders; however, despite their strong reluctance, they were influenced by the Australian way-that being via family, friends, and doctors, generally those born in Australia-diaspora.

This finding highlights the complex negotiation between maintenance of traditional practices and adaptation to Australian norms. Even when immigrants express strong commitment to "the Greek way," they are inevitably influenced by the Australian context through their children, social networks, and healthcare providers.

Religious Fasting: Continuity and Adaptation

Fasting (abstinence from certain foods) was something all generations spoke of. However, the meaning and practice of fasting showed both continuity and transformation across generations.

One explained:

> *"Fasting is what we do in our religion. We have religion inside us, and we are born with one homeland and one religion."*

An immigrant participant said:

> *"If you don't fast, you cannot understand religious events."*

Another expressed:

> *"Living in Australia, we only fast the week leading up to Easter. The people in Greece work shorter days, have days off, and can celebrate things better."*

This participant felt that if she was in Greece, she would fast more:

> *"There you would feel it more as a festive religious event because, at religious times, they change their working times based around the celebration and attending church services."*

What was interesting and important to note was the observation of a shift in the symbolic meaning of fasting in the Australian context:

> *"Obviously it's difficult to fast on Wednesdays and Fridays but I would at least try to have vegetarian food."*

Another elucidated:

> *"Fasting is religious mainly. It prepares you mentally, it cleans you before you go into the happy days, but it's also really healthy. I generally fast, unless there is a special occasion, and I may have dairy. And it's a chance to be really healthy as well. I like to fast and it's not bad."*

These accounts demonstrate how fasting practices adapt to the Australian context while maintaining religious significance. Notably, younger generations increasingly frame fasting in dual terms-both as religious obligation and as healthy lifestyle choice-suggesting a hybridization of traditional religious practice and contemporary wellness discourse.

Language and the Politics of Identity

Language plays a central role in the process of cultural maintenance and is also a marker of identity. For the participants of this study, the Greek language was a way they could retain a cultural identity, even when the language was not a primary means of communication.

Something that was said by a second-generation participant echoes this well:

> *"I don't want to lose any part of my Greek identity, like I said, I don't see myself as Australian, I don't have Australian blood, like an African elephant if it's born in Australia, we still consider it African, so we're just [Greeks] born somewhere else."*

This powerful statement reveals the essentialist nature of ethnic identity for some diaspora youth. The metaphor of the African elephant illustrates a belief in immutable ethnic belonging that transcends birthplace-a conception of identity rooted in ancestry and heritage rather than civic nationality. This perspective stands in tension with multicultural ideologies that emphasize hybrid identities and suggests the persistence of strong ethnic identification even among Australian-born generations.

Discussion

Religion as the Unchanging Core

The most significant finding of this research is the unanimous agreement across all three generations regarding the central importance of Greek Orthodox religion. While other markers of Greek identity-language proficiency, dietary practices, connection to homeland-showed variation and conflict across generations, religious belief and practice remained constant and uncontested. This suggests that religion functions as what Smolicz et al. (2001) term a "core value"-an element so fundamental to group identity that its loss would result in the dissolution of the ethnic community itself.

The integration of religious practice with health and wellbeing, as evidenced in participants' narratives about prayer, church attendance, and sacraments, aligns with Koenig, King, and Carson's (2012) model of religion-health relationships. For Greek diaspora communities, religion provides not only spiritual sustenance but also social support, meaning-making frameworks for dealing with illness and adversity, and specific health-promoting practices like fasting.

Nostalgia, Gardens, and the Somatic Memory of Place

The recurring motif of gardens in immigrant narratives warrants particular attention. Gardens function as what might be termed "transnational spaces"-physical locations in Australia that are semiotically linked to Greece through cultivation of Mediterranean plants, use of Greek agricultural techniques, and association with childhood memories. The garden becomes a site where immigrants can literally touch Greek soil (even if transported or symbolically present), cultivate Greek foods, and perform Greek labor practices. This embodied connection to place suggests that diaspora identity is maintained not only through abstract cultural symbols but through sensory and physical engagement with materially reconstructed homelands.

The nostalgia expressed by immigrants for simpler, healthier lives in Greece reflects what Boym (2001) terms "restorative nostalgia"-a longing not merely for the past but for a past imagined as more authentic, pure, and wholesome than the present. This nostalgia serves psychological functions, providing comfort and continuity, but may also create intergenerational tensions when transmitted to Australian-born generations who lack direct experience of the idealized homeland.

Generational Shifts and the Universalization of Traditional Practice

The data reveals a fascinating pattern whereby Greek cultural practices are progressively reframed in more universal terms across generations. While immigrant participants describe traditional foods, fasting, and gardens primarily in ethnic terms ("the Greek way," "what we brought from Greece"), second-generation participants increasingly articulate these same practices through universalized health and environmental discourses.

For example, traditional dietary patterns are praised not because they are Greek but because they avoid processed foods and chemicals. Fasting is valued not only as religious obligation but as a healthy lifestyle practice. Gardens are important not only as connections to Greek heritage but as sources of natural, uncontaminated food.

This universalization may represent a strategic response to Australian multicultural context, wherein ethnic particularity must be justified through appeals to shared values (health, sustainability, natural living) to gain broader legitimacy. Alternatively, it may reflect genuine hybridization of Greek and Australian frameworks, producing new forms of ethnic identity that incorporate both heritage and contemporary concerns.

The Paradox of Language

The second-generation participant's statement about Greek identity presents a paradox: asserting strong Greek identification while presumably having limited Greek language proficiency (given demographic patterns in second-generation communities). This suggests that language, while acknowledged as important, may be more significant as a symbol of identity than as a practical communicative tool. The very assertion "I don't want to lose any part of my Greek identity" in

English, using an Anglo-Australian metaphor (the African elephant), exemplifies this paradox.

This finding aligns with research showing that heritage language proficiency often declines across generations even as ethnic identity remains strong (Portes 1994, Pauwels 2005). Identity markers may persist symbolically even when their practical manifestation diminishes.

Limitations

This study has several limitations that should be acknowledged. The sample size and recruitment methods are not fully specified, limiting assessment of representativeness. The mixing of generational categories (immigrant, first, second) requires clarification, as terminology varies across migration literature. Additionally, the researcher's own positionality within the Greek Australian community is not explicitly discussed, though insider-outsider dynamics significantly shape qualitative research (Dwyer and Buckle 2009).

Conclusions

This study demonstrates that Greek Orthodox religion serves as the central, unifying element of Greek diaspora identity in Melbourne, remaining constant across three generations even as other cultural markers undergo transformation and contestation. While food practices, language use, and sense of national belonging show generational variation and conflict, religious belief and practice maintain unanimous importance and consistent meaning.

The findings suggest several important conclusions for understanding diaspora communities:

First, cultural transmission is selective and hierarchical. Not all cultural elements are transmitted equally; some (like religion) maintain primacy while others (like language, dietary practices) are more negotiable and adaptable.

Second, diaspora identity involves continuous negotiation between maintenance and adaptation. Even immigrants who express strong commitment to "the Greek way" are influenced by Australian contexts through their families, social networks, and institutions. This negotiation intensifies across generations, with Australian-born generations developing hybrid frameworks that combine Greek heritage with Australian and global discourses.

Third, the relationship between religion and health in diaspora contexts deserves greater attention in public health research and practice. For Greek communities, religious practices are inseparable from health beliefs and behaviors. Healthcare providers working with diaspora populations should recognize the integration of religious and health domains and consider how religious institutions and practices might be leveraged for health promotion.

Fourth, material and embodied practices (gardening, cooking, fasting) are crucial sites of cultural maintenance and transmission. Diaspora identity is not

only abstract or symbolic but is literally cultivated, prepared, consumed, and incorporated into bodies across generations.

Finally, this research highlights the importance of longitudinal, intergenerational approaches to understanding diaspora communities. Single-generation studies miss the dynamic processes of cultural transmission, transformation, and innovation that characterize immigrant communities over time.

Implications for Future Research

Future research should explore several questions raised by this study:

- How do Greek Orthodox religious institutions in Melbourne explicitly or implicitly support health and wellbeing?
- What gender differences exist in religious practice, cultural transmission, and health beliefs across generations?
- How do mixed-heritage families (Greek-Australian intermarriages) navigate cultural and religious transmission?
- What role does return migration or regular visits to Greece play in maintaining cultural identity and practices?
- How might the findings for Greek communities compare with other Orthodox Christian diaspora groups (e.g., Serbian, Russian, Coptic)?

Practical Applications

For healthcare providers, community organizations, and policymakers working with Greek diaspora communities:

- Recognize the central importance of Greek Orthodox religion and consider partnering with churches for health promotion initiatives
- Understand that health beliefs integrate religious, cultural, and biomedical frameworks; avoid assuming secular Western health models
- Appreciate the significance of traditional practices (fasting, dietary patterns, prayer) and work with rather than against these practices
- Acknowledge intergenerational differences in education, language proficiency, and acculturation while recognizing shared core values
- Support cultural maintenance activities (language classes, cultural festivals, traditional cooking) as contributing to community health and resilience

Final Thoughts

The Greek diaspora of Melbourne represents a vibrant, dynamic community maintaining strong ethnic identity while adapting to Australian multiculturalism. At the heart of this identity lies Greek Orthodox religion-a source of meaning, community, resilience, and health that transcends generational change. Understanding how diaspora communities like the Greeks navigate identity, belonging, and wellbeing provides

insights not only for scholarship but for building more inclusive, healthy, and culturally responsive societies.

As one immigrant participant beautifully expressed: *"For me our Greek religion is a strength, a companion, a support."* This simple statement encapsulates the profound role of religion in diaspora life-not merely as doctrine or ritual, but as lived experience that provides strength for daily challenges, companionship within community, and support through life's inevitable difficulties. In the Greek diaspora of Melbourne, religion remains the enduring thread that connects generations, bridges homelands, and sustains wellbeing across time and space.

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Shifting Paradigms: Marriage Salience and Premarital Intimacy and Sex among Elite Women in Tehran

By Farideh Khalajabadi-Farahani[*]

This study examines the relationship between marriage salience and premarital sexual behavior among female college students in Tehran, Iran, amid ongoing social and cultural transformations. Using a cross-sectional design and a comprehensive theoretical framework—including the Second Demographic Transition and Sexual Scripts Theory—the research investigates how attitudes toward marriage, gender norms, family influence, religiosity, and peer norms predict premarital sexual activity. Data from 1055 female college students in Tehran reveal that significant predictors of premarital sexual behaviors among female college students included Higher Social Prospect of Marriage (OR = 1.123, 95% CI [1.065, 1.184], p < .001), New Marital Attitudes (OR = 1.525, 95% CI [1.410, 1.648], p <.001), Low respect for Parents' Values (OR = 0.851, 95% CI [0.800, 0.905], p < .001), Liberal Peer Sexual Norms (OR = 1.125, 95% CI [1.059, 1.195], p < .001), and Age (OR = 1.087, 95% CI [1.035, 1.142], p = .001) , accounting for about 24% of variance. Findings highlight the evolving perceptions of marriage and sexuality in a society balancing traditional norms with modern influences, emphasizing the importance of culturally sensitive education and policies to address youth sexual health and behaviors.

Keywords: *Marriage, Premarital sex, Female college students, Iran, Demographic trends*

Introduction

In recent years, young people in conservative societies have been exposed to paradoxical influences. On one hand, factors such as delayed marriage, limited opportunities for marriage, and wide access to modern values through new communication technologies and global media (Azad -Armaki, Sharifi- Saie et al. 2011) encourage exploration of premarital relationships, including intimacy and sexual activity (Khalajabadi-Farahani and Cleland 2015). On the other hand, social norms, stigma, family values, and traditional marital customs—such as the importance placed on virginity—act as barriers, especially for females, due to a prevailing gender double standard regarding premarital intimacy and sex.

Therefore, young people in Iran, particularly women, find themselves at a strategic decision-making juncture during the pre-marriage period, which necessitates appropriate guidance and orientation (Khalajabadi-Farahani et al. 2019). The predominantly traditional culture of Iran faces challenges imposed by modernization, particularly regarding the emergence of new models of pre-marital

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relationships. Recent evidence indicates a rise in the prevalence of premarital sexual behaviors and an increasing acceptance of such behaviors among the younger generation (Khorshidzadeh and Zangoee 2006, Mohammadi et al. 2006, Motamedi et al. 2016, Farahani 2020, Khalajabadi-Farahani 2020). However, detailed information regarding how young individuals navigate these social contexts to find their paths in life and toward marriage remains scarce or non-existent. The factors influencing why some youths choose to abstain from premarital sexual relations while others engage in such behaviors are not clearly understood (Khalajabadi-Farahani et al. 2019). Additionally, it is unclear how Iranian girls with premarital sexual experiences confront the social norms associated with marriage and family expectations.

A survey among female college students in 2005 revealed a high prevalence of premarital heterosexual friendships, but a relatively low rate of sexual intercourse (Khalajabadi-Farahani 2008). This indicates that young people in conservative societies are increasingly navigating complex decision-making process related to premarital sex. Being together while living apart is also becoming a common feature of some premarital relationships, with sexual activity often occurring within these arrangements. A study conducted in Yazd aimed at examining family changes revealed that, according to a significant proportion of respondents, there will be an increase in marriage age, premarital sexual relations, and divorce within Iranian families, with estimates of 86.3%, 76.6%, and 88.2%, respectively (Abbasi-Shavazi and Askari-Nodoushan 2012). Conversely, a greater proportion of young people perceive premarital dating as socially acceptable, whereas premarital sexual relations face limited social acceptance. It appears that youth have broken traditional norms regarding romantic and emotional relationships with the opposite sex; however, a substantial number still adhere to traditional norms concerning premarital sexual conduct and marriage (Khalajabadi-Farahani and Cleland 2015, Motamedi et al. 2016). These scientific and occasionally contradictory or conflicting data may indicate a society in transition. Much of this adherence could be attributed to the religious, customary, and legal marital salience for any form of sexual contact in Iran, combined with the high generalisability of marriage in the country.

Changes in Sexual Attitudes, Behaviors, and Marriage Patterns in Iran

In recent years, various studies and evidence—derived from cross-sectional surveys conducted on a small scale—indicate an increasing trend in premarital sexual behaviors among youth and adolescents (Khalajabadi-Farahani et al. 2012, Ahmadabadi et al. 2015, Khalajabadi-Farahani 2015, Shokoohi et al. 2016). A meta-analysis of studies carried out between 2001 and 2015 revealed that the prevalence of premarital sexual experiences ranged from approximately 8% to 41%. These experiences were significantly more common among males than females, with an estimated prevalence of 22.5% in Tehran and 14.7% in other cities. Considering the proportion of Tehran's population relative to the entire country, the average prevalence of premarital sexual experience among youth aged 16.6 to 23.5 years was estimated at 16% (Khalajabadi-Farahani 2015).

A national study conducted in 2016 aimed to assess awareness, attitudes, and behaviors of young people aged 15 to 29 in 13 urban and rural provinces across Iran. This study involved 2,456 men and 2,412 women, providing a

representative sample of the youth population. It found that 21% of young people had experienced premarital sexual activity; among males, this figure was approximately 32%, whereas among females, it was around 10% (Shokoohi et al. 2016). This was the only nationally representative study on youth sexual behaviors, and its findings aligned with the meta-analytical results from 2001 to 2015 (Khalajabadi-Farahani 2015).

A study in 2005 among female university students in Tehran revealed that about 52% had experienced romantic relationships with the opposite sex, approximately 39% reported physical contact, and around 23% had engaged in sexual contact. Romantic relationships among female students often began at age 12, with roughly 40% experiencing at least one such relationship by age 18. Sexual contact typically started around age 15, with about 20% engaging in sexual activity by age 20. Intimate sexual contact generally commenced much later, beginning around age 18, and approximately 10% reported sexual contact by age 23 (Khalajabadi-Farahani 2008).

Furthermore, comparisons of youth attitudes across different surveys indicate that the proportion of individuals favoring abstinence before marriage has declined in recent years, which may reflect changing behavioral patterns among young people. For example, in 2005, about 75% of female students supported abstaining from premarital sexual contact; however, this figure decreased to approximately 53% in a comparable survey conducted in 2018. Conversely, the percentage of female students opposing premarital abstinence increased from 14.6% in 2005 to around 29.2% in 2018 (Khalajabadi-Farahani et al. 2012).

Consistent with evolving attitudes and behaviors among youth, a study in 2012 demonstrated that premarital sexual experience among Iranian young people is associated with delayed marriage. Specifically, individuals who have not engaged in romantic relationships with the opposite sex tend to marry significantly earlier than those with sexual experience do. Furthermore, early sexual encounters with the opposite sex before marriage are linked to notable postponements in marriage, with this delay particularly pronounced among males compared to females (Khalajabadi-Farahani 2012).

Trends in Age at Marriage

In 2016, the average age at marriage was 27.1 for men and 23 for women (Statistical Centre of Iran 2016). In contrast, in 1976, the average ages of marriage were 24.1 for men and 19.7 for women, indicating that over the years of 1976-2016 (four decades), men and women have married approximately 3 and 3.3 years later, respectively. This trend reflects an increasing gap between adolescence and marriage, suggesting a growing period of maturity and independence before formal unions.

Despite this general trend, some regions still report marriages before the age of 18. The percentage of girls aged 15–19 who are married varies significantly across provinces, from 12.5% in Ilam to 33.2% in Razavi Khorasan. In Tehran, only 13.3% of girls aged 15–19 are married. Overall, about one-fifth of girls under 18 are married. Moreover, in the north-eastern and north-western provinces approximately one-third of girls under 18 have entered into marriage (Alizade et al. 2017), underscoring regional disparities and cultural diversity.

Aims and Objectives

This study aims:

- To assess in what ways the meanings of marriage—such as marital salience, prospects or hopes, and attitudes—differ between women who engage in premarital sex and those who abstain before marriage?
- To examine to what extent various factors related to marriage—such as beliefs and attitudes towards marriage, family influences, individual motivations and desires, social and gender norms, and religious considerations— determine the intention to engage in or actual experience of premarital sexual relationships among girls?
- To assess whether marital salience, prospects, and attitudes predict premarital sex when controlling for other factors?

Literature Review

Considering the relationship between attitudes toward the importance of virginity and sexual behaviors in religious and traditional societies, studies within this domain are applicable. Cinthio (2015) examined the different meanings and various claims regarding virginity, analyzing norms related to relationships, gender, marriage, and conflicts between diverse normative systems. The researcher, through in-depth interviews with immigrant students from countries such as Iraq, Iran, Palestine, Pakistan, and Somalia in Sweden, demonstrated that for most adolescents, marriage is regarded both as a significant matter and as a central component influencing other topics. Protecting chastity is a fundamental social concern for them. For these individuals, virginity is perceived as a valuable asset within the marriage economy, a matter that extends beyond individual concerns to involve families and social networks (Cinthio 2015). The view of marriage as a core issue influencing other domains was among the key findings of the above-mentioned study.

One related study aimed to investigate the impact of premarital interactions with the opposite sex on the age at marriage and the inclination toward marriage among university students in Tehran. It revealed that sexual experience significantly determines the increase in the age at marriage. Furthermore, friendship with the opposite gender was associated with a greater desire to marry among females, whereas males' intentions for engaging in such friendships were not primarily motivated by marriage (Khalajabadi-Farahani 2012). This research demonstrated clear gender differences regarding the motives for premarital relationships, with girls valuing marriage more in such interactions, unlike boys, for whom friendship did not necessarily imply an intention to marry.

A review of domestic studies also indicates a form of intergenerational shift in the value placed on marriage. A study aimed at illustrating generational changes in the valuation of marriage, employing a sociological-cultural perspective, was conducted in 2013 among 500 women born between 1963 and 1995 in Zanjan. It showed that the valuation of marriage among women born between 1988 and 1995

was significantly lower than that of women born before 1983. Religiosity was directly and significantly related to the importance of marriage, whereas experiences of globalization showed a negative correlation (Saraie and Ojaghloo 2013). Additionally, a study conducted in Yazd among 155 mothers and 155 daughters found that daughters held more modern values concerning celibacy and spouse selection, including consanguineous marriage, compared to their mothers. This difference may be attributable to ideological and generational changes between the two groups (Nodoushan et al. 2009). Moreover, a survey involving 723 women aged 15–49 in Yazd revealed that changes in attitudes toward bachelorhood, the prioritization of marriage over education, delayed marriage, and premarital friendships are increasingly influenced by individualism, self-actualization, and cultural capital (Nodoushan et al. 2009).

In this context, Hosseini and colleagues (2018) conducted a phenomenological qualitative study aimed at uncovering the latent meanings of marriage among young people residing in Tehran. They found that reluctance to marry was attributed to four categories: "fear," "disinclination," "decline of transcendent values," and "hedonism." These reasons were interpreted through three identified conceptual frameworks: "economic insecurity of men," "inability to manage expenses," and "financial independence of women." Additionally, newly emerging value systems—comprising moral values and social-communicative relations — such as social status and intercultural interactions between genders, were also discussed. This research effectively illustrates the relationship between considerations related to marriage and shifting patterns of communication between genders before marriage. Furthermore, the value of sexual freedom as the core conceptual category explaining premarital sexual behavior was demonstrated in one qualitative study employing a grounded theory approach (Hosseini et al. 2018).

Despite these findings, Iranian society, particularly in some provinces, continues to hold a traditional perspective on chastity and virginity for unmarried girls. This point was supported by a study among newly engaged men in Kerman, which examined attitudes of 790 young men toward one of the most vital marriage values virginities. Nikirashidi et al. (2019) revealed that 90% of these young men considered virginity as essential for girls, and 82% regarded it as a valuable asset. This indicates the persistence of a conservative norm regarding virginity among young men. However, it is also necessary to consider the country's heterogeneity in attitudes and sexual behaviors. Similar studies should be conducted in other regions with varying levels of development and cultural and ethnic differences to generalize these findings across Iranian society (Nikirashidi et al. 2019). A recent study involving 700 unmarried girls in Tabriz, conducted in 2021, found that only approximately 35.2% regarded preserving virginity as an important issue before marriage in contemporary society. About 27% were uncertain on the matter, while roughly 38% considered it unimportant. The perceived importance of virginity, measured by a score range of 7–35, was significantly higher among girls born in the 1970s compared to those born in the 1980s and 1990s ($p < 0.05$). According to a multivariate linear regression analysis, key factors influencing the importance placed on virginity included older age, stronger religious affiliation, living with both parents, and lower consumption of the internet and social media for sexual information (Naghizadeh 2024).

Significance of the Study

Some young people perceive interactions with the opposite sex as opportunities to develop romantic relationships and enhance their prospects for marriage. However, there is limited information regarding their reasoning processes in such situations, as well as the strategies they adopt toward marriage and their approaches to premarital sexual relations. Particularly given the societal importance attributed to marriage, scant data exists on how the meaning of marriage has evolved and the role it plays in predicting premarital sexual behaviors.

While many theories explain premarital sex, most are rooted in liberal societal contexts, and there are few—if any—explicit theoretical frameworks addressing changes in premarital sexual behaviors within conservative societies that place strong emphasis on marriage.

This study seeks to assess whether perceptions of the salience of marriage, marital prospects, and marital values influence premarital sex among young unmarried women in Iran. Its primary aim is to examine the association between the meaning of marriage and premarital sexual activity, and to evaluate a theoretical framework that considers the role of various factors at different levels in predicting premarital sex.

The lack of existing theoretical models that explicitly incorporate cultural and contextual factors—such as the perceived importance and meaning of marriage—in explaining premarital sexual behaviors underscores the importance of this research. Exploring the cultural and social antecedents of premarital sexual conduct and addressing the paucity of studies in this domain are critical for advancing knowledge in this field. The coexistence of conservative, traditional norms surrounding marriage and its significance alongside evidence of premarital sexual activity requires further investigation, explanation, and scholarly attention.

Most existing research in Iran has either focused on aspects of health and social dimensions of premarital sexual behavior or specifically examined marriage and related values. However, there has been no study to date that investigates the relationship between these two phenomena: (1) changes in premarital sexual behaviors, and (2) shifts in attitudes and values toward marriage. This study aims to address this significant research gap by assessing the interrelation between meaning of marriage (Salience, aspiration, and values) and premarital sexuality among educated females in Tehran.

Theoretical Perspective

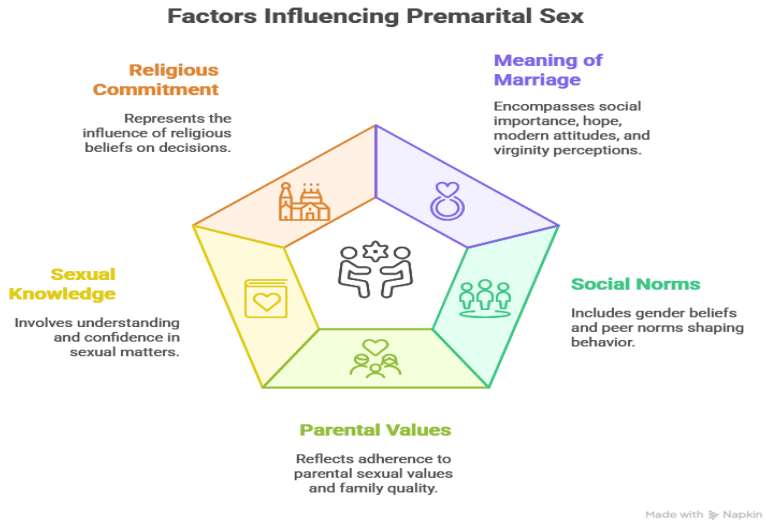
The change in the perceived meaning of marriage is grounded in the Second Demographic Transition theory (Van de Kaa 2002, Lesthaeghe 2010), which emphasizes shifts in individuals' attitudes toward marriage as the sole family structure. This perspective and understanding of the importance of marriage, its sexual function, attitudes toward sexual relations, and the significance of virginity was assessed. Another relevant theory, based on symbolic interactionism, is the Sexual Scripts Theory. Scripts are metaphors used to understand and describe human behaviors within social life. This study hypothesizes that girls' sexual behaviors are

guided by these scripts, serving as guidelines for different aspects of life (Simon 1973). According to this framework, societal norms, peer influences, gender norms at the cultural scenario level, family relationships, and adherence to parental sexual values operate within interpersonal scripts, as do individual attitudes and sexual knowledge at the intrapersonal level. Intrapsychic scripts involve personal understanding and reinterpretation of sexuality and its meanings. Individuals critically and creatively play the role of responsible agents in these scripts, which leads them to interpret their ideal sexual scripts for behavior (Simon and Gagnon 2003). Additionally, elements such as attitudes, self-efficacy, social norms, and behavioral intentions incorporated in the conceptual model are aligned with the Theory of Reasoned Action (Ajzen and Fishbein 1980).

Conceptual Framework

This study incorporates elements from several theoretical foundations, which are elaborated upon below. Since the research aims to empirically test a conceptual model derived from a qualitative investigation, the proposed theoretical framework reflects the considerations of girls at both micro- and macro-social levels regarding their decisions to engage in premarital sexual relations (Khalajabadi-Farahaniet al. 2019) (Figure 1).

Figure 1. *Conceptual Model of the Socio-Cultural Factors Influencing Premarital Sexual Behavior*



According to this model, one significant consideration for girls when deciding to engage in premarital sexual activity is marriage itself, including importance and motives for marriage, hope for marriage (marital Prospect), and the meaning and values attached to marriage and sexuality. Other crucial factors influencing their sexual behavior decisions revolve around their perceptions of social and gender norms, religious adherence, conformity to parental values and expectations, family relationship quality, as well as sexual knowledge and self-efficacy.

Material and Methods

This article is based on cross-sectional data collected from female students at undergraduate, master's, and doctoral levels in both public and private universities in Tehran. The data collection was conducted in 2018 using a multistage cluster sampling method. Tehran accounts for a significant proportion of the student population and is more exposed to rapid social changes compared to other provinces; provinces typically follow behavioral shifts observed in major cities. Therefore, female students from Tehran were chosen as the study population.

Inclusion criteria for participation were: informed consent to participate, enrollment in one of the specified academic levels (Bachelor's, Master's, or Doctorate) at selected public and private universities in Tehran, and holding Iranian nationality. The sampling approach was quota-based cluster sampling. The sampling plan was designed based on the proportion of students from public and private universities, various fields of study, and academic levels. Accordingly, the appropriate sample size was allocated proportionally to each subgroup.

After obtaining approval from the selected universities in 2018 (1397-1398), sampling was carried out in both public and private institutions. Three multi-disciplinary public universities were randomly selected based on cooperation levels, and necessary permissions were secured. Similarly, two private non-profit universities were chosen randomly, and required permissions were obtained.

The first stage of sampling involved stratifying by university type, while the second stage stratified by field of study. Within each field, one or more faculties were randomly selected, and sampling was conducted. Class lists for daytime courses were obtained based on academic year, and with coordination from department officials, about the first or last 10 minutes of selected classes were dedicated to sampling. During coordination, students' male classmates and instructors were asked to leave the classroom for 10 minutes. The researcher then provided information about the study to participating female students and invited them to participate by giving their email addresses or mobile numbers anonymously so that an online survey link could be sent to them. Prior to participation, informed verbal consent was obtained, emphasizing confidentiality and anonymity. The email or mobile number was collected without names, and within 48 hours, the researcher sent the online survey link (Café Pardazesh[1]). A reminder email was also sent after two days to those who had not yet completed the questionnaire.

The primary tools of this study include an online questionnaire consisting of 71 items and 12 questions related to the demographic and socio-economic characteristics of the individual. Each item was measured using a 5-point Likert scale (strongly agree, agree, neutral, disagree, strongly disagree). This study was approved by the research council of the National Institute of Population Research[2] in Iran in 2018. All ethical standards, including anonymity, confidentiality, and voluntary participation, were strictly upheld.

[1] http://www.cafepardazesh.ir/
[2] http://www.nipr.ac.ir

Pilot and Instrument Development

The pilot was conducted on 182 young women aged 18 to 40 using an online questionnaire and a snowball and convenience sampling method. Feedback from the participants regarding the questions and items was collected, and the pilot data were used for exploratory factor analysis and assessment of internal consistency (reliability). Based on the results of the factor analysis and participants' feedback, some items were removed, and the wording of some questions was revised. Items that, upon removal, increased the internal consistency (reliability) of the scale or had high correlation with other items within the same factor were eliminated. As a result, the total number of items was reduced from 71 to 61.

Variables

The demographic and socio-economic variables in this study included:

- Age: under 20 years, 20-21 years, over 21 years
- Living situation: living with both parents, living with one parent, residing in a student dormitory, living with friends in a private residence, living alone, or others
- Employment status: Yes, to earn income; Yes, without the goal of earning income; No
- Monthly income: less than 20 million Rials, between 20 and 40 million Rials, more than 40 million Rials (IRR) (on average, 1 US dollar equal to 40,787 IRR, 2018)
- Mother's education: illiterate, elementary school, guidance school, high school/ diploma, bachelor's degree, master's degree, doctoral degree
- Father's education: illiterate, elementary school, guidance school, high school/ diploma, bachelor's degree, master's degree, doctoral degree
- University type: public or private
- Educational level: associate degree, and bachelor's, master's, specialized doctorate
- Field of study: humanities, basic sciences, agriculture, arts, engineering, medical sciences

Some variables were categorized as follows:

- Cigarette use: never, occasionally, often, always
- Alcohol consumption: less than 5 times, more than 5 times, never
- Experience with relationships with the opposite sex: no experience, only friendship; both friendship and sexual relationship; no response preference

Other variables were constructed based on related items and examined through factor analysis, along with assessments of internal consistency (reliability) and validity. Details of these variables are presented in Table 1.

Table 1. *Scales and related Items, Score Range and Cronbach's Alpha, Direction of the Construct*

Variable	Scale or Construct	Range	Cronbach's Alpha	Direction of Construct	Items (Questions/Statements)
Independent	**Salience of Marriage** (Importance of marriage)	7-35	0.871	A higher score indicates high importance of marriage, lower score indicates low importance	1. Within the next 5 years, my most important plan is to get married. 2. Marriage is a higher priority for me than continuing my education. 3. I do not intend to get married at all. 4. If the opportunity for marriage arises, I want to get married very much. 5. Marriage is very important to me. 6. I prefer to get married sooner rather than having a friendship with boys.
	Marriage prospect	4-20	0.707	A higher score indicates more optimism and hope for marriage or better optimism, and vice versa	7. Marriage is the only solution to meet young people's sexual needs. 8. Nowadays, the opportunity for girls to get married is less available. 9. The intention of boys to be friend with girls is only to have fun. 10. Boys nowadays are not trustworthy for marriage. 11. The conditions for marriage have become so difficult that fewer boys are thinking about marriage.
Independent	Virginity Importance	4-20	0.832	A higher score indicates greater importance of virginity, and vice versa	12. Preserving virginity is very important to me. 13. A girl's value is not based on her virginity. 14. Virginity is a red line that must be maintained. 15. Even the most enlightened boys consider their future wives' virginity very important at the time of marriage.
	Adherence to Parental Values	3-15	0.801	A higher score indicates more adherence, and vice versa	16. To respect my parents, I do not engage in sexual relations before marriage. 17. My family has worked hard for me, so I do not ignore their values. 18. If I engage in sexual relations, I feel I have betrayed my family.

Variable	Scale or Construct	Range	Cronbach's Alpha	Direction of Construct	Items (Questions/Statements)
	Family Relationship Quality	30-6	0.756	A higher score indicates better relationship quality and vice versa	19. My mother always gives me good guidance. 20. My parents overall don't trust me very much. 21. Often there isn't a close, intimate relationship between my parents. 22. My mother has fewer opportunities to have close communication with us. 23. My family considers talking about sexual matters to be contrary to modesty and chastity. 24. If I am in a relationship with someone of the opposite sex, I discuss it with my mother.

Table 2. *Scales and related Items, Score Range and Cronbach's alpha, Direction of the Construct*

Construct (Factor)	Scale Range	Cronbach's Alpha	Direction for Scoring My knowledge about girl-boy relationships is insufficient. *(higher score = good knowledge, lower score = weak)*	Statement
Sexual Knowledge	3-15	0.741	higher score = good knowledge, lower score = weak	I have enough information about sexual issues. I can obtain any kind of information about sexual health from the internet.
Self-efficacy	3-15	0.605	higher score = good knowledge, lower score = weak	I am capable of managing my relationships with others. I can define my boundaries in relationships with boys. I cannot easily say no to others' requests.
Peer Norms	4-20	0.724	higher score = permissive peer norms, lower score = conservative	Virginity is important to most of my friends. Most of my friends believe that if they love someone, they can have sex with them. Most of my friends think that someone who hasn't experienced sex before marriage is not modern. Most girls still adhere to avoiding sex before marriage.
Belief in gender equality regarding premarital sex	2-10	0.747	higher score = belief in gender equality in sexual relationships, lower score = traditional dual-gender beliefs	If a girl has sex before marriage, the boy won't marry her. Sex before marriage causes many problems for girls.

Construct (Factor)	Scale Range	Cronbach's Alpha	Direction for Scoring	Statement
			My knowledge about girl-boy relationships is insufficient. *(higher score = good knowledge, lower score = weak)*	
Religious commitment	3-15	0.868	higher score = stronger religiosity, lower score = weaker	The most important factor preventing me from having sex before marriage is my religious beliefs.
				I believe that when someone is religious, they are under divine control.
				My religious beliefs have prevented me from entering relationships with the opposite sex I am not permitted to.
Premarital sex intention	4-20	0.916	higher score = stronger intention to abstain, lower = weaker	Even if I like a boy, I would not have sex with him.
				I would have sex with someone of the opposite sex whom I truly love.
				Even if someone intends to marry me, I would not have sex with him.
				I plan to experience sex before marriage to see what it is like.

Based on the sample size calculation formula for case-control studies, the estimated sample size was 780 individuals. Considering a design effect of 1.5 and the cluster sampling method, the final sample size was estimated at 1170 individuals. Due to operational, fieldwork, and time constraints of the research, the sampling was halted with a total of 1060 female students.

Based on the pilot study, and given the high response rate and minimal missing data, this sample size was deemed adequate for analysis. The response rate to questions ranged from 98% to 99%. During the analysis phase, 5 questionnaires were excluded due to incomplete responses or neutral answers to most items. In total, 1055 questionnaires were ultimately analyzed.

The online questionnaire data were extracted in Excel format and analyzed using SPSS. The sample was proportionally matched to the desired representation of students from public and private universities. However, due to fieldwork difficulties and lack of cooperation from some faculties, such as the Faculty of Arts, the number of responses in some disciplines was less than expected in the student population. During analysis, data were weighted based on the study field variable to correct for this disparity. Therefore, differences between the sample and the target population regarding the study field were adjusted using weighting based on academic group. During descriptive and bivariate analyses, data were weighted according to these coefficients. The weighting coefficients were applied as follows: humanities (0.98), basic sciences and agriculture (0.39), arts (0.65), engineering sciences (1.07), and medical sciences (1.39).

Data Analysis

Since the questionnaire was completed online, the data extracted from the Excel form were imported into SPSS. After reviewing the data for missing values, data cleaning procedures were applied to each variable. In describing the sample, the data were weighted based on the type of university. Each construct of the independent variables was examined using exploratory factor analysis, and the mean scores of these constructs among girls—based on their experiences with relationships before marriage—were compared using independent t-tests and ANOVA. Subsequently, multivariate analysis was conducted using various dual regression models, where the effects of each factor were controlled for one another to determine the predictive role of each variable after adjusting for the others. The final model identified the key predictors of the intention and behavior regarding premarital sexual activity.

Results

Description of the Demographic Characteristics of the Sample

The average age of females recruited in this study was 21.2 years (SD = 3.3), with ages ranging from 17 to 40 years. From among them, 31.5% were under 20 years old, approximately 36% were between 20 and 21 years old, and about 33% were over 21 years old. Most lived with both parents (80%), around 9% reported living in a dormitory, and about 6% lived with one parent. Only about 1% lived with friends in a private residence, and approximately 2.7% lived alone.

The majority of the female students investigated had no work experience (64.3%), while 35.7% had work experience, and around 27% of them worked to earn an income. Regarding household income status, approximately 48% reported a monthly income exceeding 40 million IRR, 40% had income between 20 and 40 million IRR, and about 12% of families reported earning less than 20 million IRR.

In terms of parental education, most had mothers with high school diploma (43.6%) and bachelor's degrees (31.2%), while only 8.8% held postgraduate degrees. Interestingly, the fathers of girls generally had higher levels of education (38%, a high school diploma, 28% holding a bachelor's degree, and 20% possessed master's or doctoral degree).

About 58% of girls studied at an Islamic Azad University, and approximately 42% at a public university. Most students were enrolled at the bachelor’s or associate degree level (81%), 18% at the master's level, and only 1.4% at the doctoral level. The majority of the sample (48%) studied in the Human Sciences group, followed by about 30% in Engineering Sciences, 6% in Basic Sciences and Agriculture, 0.9% in Arts, and 2.6% in Medical Sciences.

Approximately 81% of the female students have never tried smoking; about 13% have smoked occasionally, only 3% smoked frequently, and 2% are regular smokers. Regarding alcohol consumption, 75% have never used alcoholic beverages; around 14% have tried alcohol fewer than 5 times, and about 11% have consumed alcohol more than 5 times. In terms of searching for sexually explicit materials on the

internet, 27.1% have done so 1-2 times, 33.2% have searched for such content more than 5 times, while 28.2% have never searched for this type of content online.

Experience of Relationships with the Opposite Sex before Marriage among Female Students, 2018

Among the female students studied in 2018, about 9% did not wish to report their sexual behavior before marriage. Approximately 42% reported having no type of relationship, including friendship or sexual relations, before marriage. About 36% had only experienced friendships, and around 13% had experienced both friendship and sexual relationships before marriage.

Salience of Marriage

The importance of marriage, from the perspective of female students, was measured using six attitude statements on a five-point Likert scale. Descriptive results showed that about 25% of students were not very confident and had no specific opinion regarding their marriage plans within the next five years. Approximately 40% agreed or somewhat agreed that marriage is their main plan in the next five years, while slightly less (35%) disagreed. Responses followed a normal distribution.

Regarding the priority of marriage over continuing education, a significant proportion of students (61%) disagreed with this, and only about 20% believed marriage should take priority over further studies; this is an important finding. Overall, about 76% of girls intended to marry, with most opposing the statement "I do not intend to marry at all." Only around 10% agreed or strongly agreed, meaning they did not intend to marry. The responses to this statement showed a positive skew (tending toward higher values), indicating a high desire for marriage among girls and a lack of complete celibacy.

Descriptive analysis of the fourth statement revealed that about 50% believed they would like to marry if the opportunity arose, while only 19.3% did not have such an inclination, and nearly 30% had no opinion on the matter. The percentage who considered marriage very important was about 51%, whereas a smaller portion (27.3%) thought it was not very important.

Regarding the preference for early marriage over having a serious relationship with the opposite sex, responses were normally distributed. About 44% favored marriage, indicating they preferred marrying rather than engaging in relationships; an equal proportion (43%) opposed this view, and 16% had no opinion. This suggests that friendships with the opposite sex are not seen as competing with marriage but are separate concepts. Lastly, regarding the statement "Marriage is the only way to satisfy young people's sexual needs," a significant proportion disagreed (35.4%), while about 47% agreed, and around 18% had no opinion.

Table 1. *Description of the attitudes towards Marriage among Female College Students, 2018*

Statement	Strongly Agree	Disagree	Neutral	Disagree	Strongly Disagree
Marriage Main Plan next 5 Years	12.9%	27.2%	24.6%	22.1%	13.1%
Marriage, higher priority than education.	6.2%	11.8%	20.0%	39.2%	22.9%
No intention to marry	3.4%	6.5%	14.9%	37.9%	37.3%
Really love to marry if opportunity arises	17.1%	33.7%	29.8%	16.7%	2.4%
Marriage, very important to me.	15.8%	34.1%	22.1%	20.6%	6.7%
Marry better than heterosexual romantic relations	18.9%	24.9%	16.4%	26.9%	12.0%
Marriage, the only solution for sexual needs.	23.7%	23.4%	17.0%	22.0%	12.9%

Table 2. *Pearson Correlation Coefficients between various Attitude, Normative, Behavioral Scales, and the Importance of Marriage*

Variables	Marital Salience	Marital Prospect	Marital & Sexual Attitudes	Compliance with parental values	Peer Sexual Norms	Compliance with religion	Premarital Sexual Intention
Marital Salience (importance)	1						
Social Prospect of marriage	-0.198**	1					
New Marital & Sexual Attitudes	0.501**	-0.280**	1				
Compliance with parental values	0.341**	0.235**	0.551**	1			
Peer Sexual Norms	-0.262**	-0.032**	0.412**	0.288**	1		
Compliance with religion	0.502**	0.172**	0.553**	0.414**	0.349**	1	
Premarital Sexual Intention	0.418**	0.212**	0.659**	0.511**	0.537**	0.541**	1

This table presents the Pearson correlation coefficients among several variables related to attitudes, social norms, behaviors, and the importance of marriage. Notably, there are strong positive correlations between the importance of marriage (marital salience) and attitudes toward marriage and sexual matters, religious adherence, and premarital sexual intentions, highlighting how these factors tend to move together. For instance, the highest correlation is observed between marital and sexual attitudes and premarital sexual intention ($r = 0.659$), suggesting a close link between positive attitudes in these areas.

Additionally, social and familial influences such as compliance with parental values, peer norms, and religious commitment are significantly correlated with each

other and with the importance of marriage, indicating that social context plays a crucial role in shaping individuals' marriage-related attitudes and intentions. Conversely, perceived marriage prospects show weaker, negative associations, implying that lower optimism about marriage prospects might be related to a higher emphasis on the importance of marriage. Overall, the correlations underscore the interconnectedness of personal attitudes, social norms, and behavioral intentions regarding marriage.

Determinants of Premarital Sexual Behavior among Female Students in Tehran

A logistic regression analysis was conducted to identify predictors of premarital sex among female college students. The model included variables such as Marital Salience, Social Prospect of Marriage, New Marital Attitudes, Respect for Parents' Values, Peers' Sexual Norms, Religiosity, and Age. The overall model was statistically significant, $\chi^2(7) = 95.038$, $p < .001$, and explained a substantial portion of the variance in premarital sexual activity.

Significant predictors included *Social Prospect of Marriage* (OR = 1.123, 95% CI [1.065, 1.184], $p < .001$), *New Marital Attitudes* (OR = 1.525, 95% CI [1.410, 1.648], $p < .001$), Compliance with *Parents' Values* and attitudes (OR = 0.851, 95% CI [0.800, 0.905], $p < .001$), *Peer Sexual Norms* (OR = 1.125, 95% CI [1.059, 1.195], $p < .001$), and *Age* (OR = 1.087, 95% CI [1.035, 1.142], p = .001). Higher perceptions of marriage prospects, more liberal marital attitudes, liberal peer sexual norms, and older age increased the likelihood of engaging in premarital liberal sex.

Religiosity approached significance (OR = 0.941, 95% CI [0.882, 1.003], p 13= .064), suggesting a potential trend where greater religiosity might be associated with lower odds of premarital sex, though this was not statistically significant.

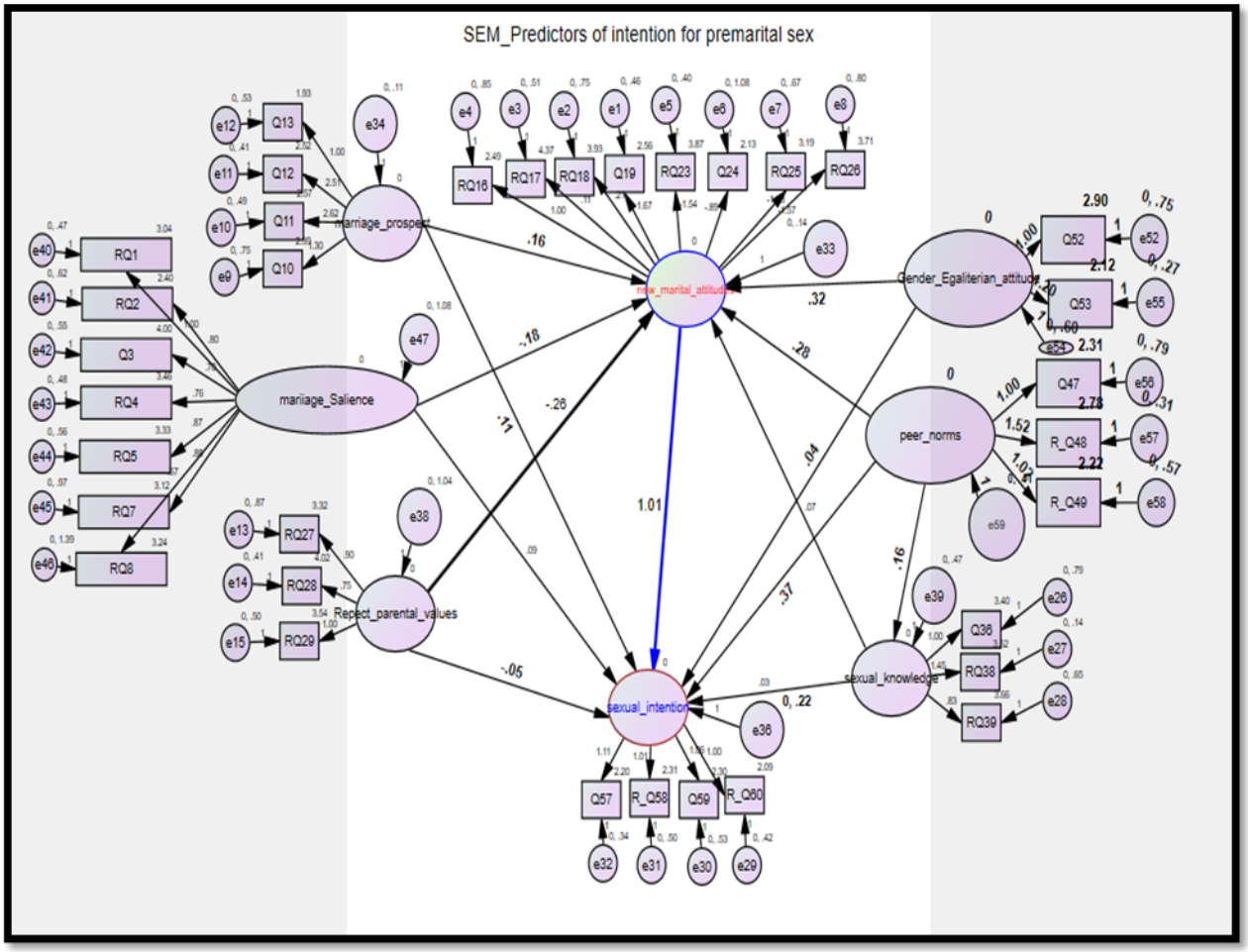
Table 3. *Predictors of Premarital Sex among Female College Students using Binary Logistic Regression*

Predictor	B	S.E.	Wald	Df	p	OR (Exp(B))	95% CI for OR
Marital Salience	0.013	0.015	0.669	1	.413	1.013	0.983 – 1.044
Social Prospect of Marriage	0.116	0.027	18.633	1	**<.001**	**1.123**	1.065 – 1.184
New Marital Attitudes	0.422	0.040	112.499	1	**<.001**	**1.525**	1.410 – 1.648
Respect for Parents' Values	-0.161	0.031	26.301	1	**<.001**	**0.851**	0.800 – 0.905
Peer Sexual Norms	0.118	0.031	14.561	1	**<.001**	**1.125**	1.059 – 1.195
Religiosity	-0.061	0.033	3.440	1	.064	0.941	0.882 – 1.003
Age	0.083	0.025	11.076	1	.001	1.087	1.035 – 1.142

Note: The variables entered into the model included Marital Salience, Social Prospect of Marriage, New Marital Attitudes, Compliance with Parents' Values, Peer Sexual Norms, Religiosity, and Age. The model accounted for approximately 24.0% of the variance in premarital sex (Cox & Snell $R^2 = 0.240$). The overall model was statistically significant, $\chi^2(8) = 21.908$, $p = 0.005$, as indicated by the Hosmer-Lemeshow goodness-of-fit test ($p = 0.005$).

In order to explain predictors of premarital sexual intention among female college students, based on the identified factors, a Structural Equation Model was constructed using AMOS.

Figure 1. *Structural Equation Model of Predictors of Premarital Sexual Intentions among Female College Students in Tehran*



Minimum was achieved, Chi-square = 4033.379, Degrees of freedom = 513, Probability level = .000

Based on the above model, the strongest effect on the intention to engage in sexual behavior before marriage comes from the modern attitude toward marriage and premarital sexual relations (effect size = 1.01). This strong positive coefficient indicates the important role of attitude changes in the domain of sexual relations and the significance of sexual skills for marital success, as well as the reduced emphasis on virginity in shaping the intention and, consequently, the premarital sexual behavior. This sexual attitude is influenced by changes occurring in the social structure and the surrounding environment of girls: negatively affected by the decreasing importance of marriage (−0.18), and positively affected by the outlook or prognosis of marriage (0.16). Changes in the outlook and importance of marriage have meaningful impacts on sexual attitudes.

Another important factor is autonomy or, conversely, adherence to parental sexual values; the less salient these are, the more dominant the modern sexual values become (−0.26). Egalitarian beliefs about sexuality in the pre-marital context are also a determinant of premarital sexual behavior, with a high and positive impact on sexual attitudes (0.32). Finally, peer norms are also a significant determinant of premarital sexual behavior (0.28); with these factors, the role of religious institutions diminishes. In fact, religion exerts its influence on sexual attitudes and intentions through adherence to parental sexual values and other gendered attitudes and peer norms. Finally, girls' sexual knowledge is a determinant factor in intention and behavior (0.22).

It appears that the major social institutions of the family, peer norms, and gendered beliefs have substantial impacts on girls' sexual attitudes, with the greatest salience in these three domains. The importance and prognosis of marriage influence sexual attitudes with coefficients of −0.18 and 0.16, respectively, and prognosis also exerts a relatively substantial direct effect on the intention to engage in sexual behavior (coefficient = 0.11).

Discussion

This study identified several significant predictors of premarital sex among young women, including perceptions of the Social Prospect of Marriage, New Marital Attitudes, Compliance with Parental Values, and Peer Sexual Norms, after controlling for age. Higher perceptions of marriage prospects, more liberal attitudes toward marriage and sexuality, supportive peer sexual norms, and older age were associated with an increased likelihood of engaging in premarital sex. Furthermore, religion appeared to influence sexual behavior indirectly through these mediating factors, although its direct effect diminished in the multivariate analysis. Collectively, these variables accounted for approximately 24% of the variance in sexual experience.

The model confirms that changes in attitudes and values regarding marriage and sexuality are primary factors driving premarital sexual behaviors and intentions. These findings align with a previous meta-analysis of 530 studies which revealed significant shifts in young people's sexual attitudes and behaviors between 1943 and 1999, particularly among women. Over this period, young people became more sexually active at earlier ages. The proportion of sexually active young women increased from 13% to 47, and acceptance of premarital sex grew markedly. Approval among young women rose from 12% to 73%, while among young men, it increased from 40% to 79%. Additionally, feelings of sexual guilt declined, and the link between attitudes and behaviors was stronger among women. These data support theories suggesting that cultural influences have a more substantial impact on female sexuality. Overall, shifts in attitudes and values related to marriage and sexuality are key drivers of premarital sexual behavior and intentions (Wells and Twenge 2005). Notably, the influence of perceptions of marriage prospects on sexual behavior operates through modern sexual attitudes, such as valuing sexual relationships as a means of social and emotional development, which emerged as the most significant predictors. These findings suggest that young women increasingly

adopt new perspectives toward marriage, influenced by ongoing structural and cultural changes that challenge traditional norms. Change In attitudes towards premarital cohabitation, premarital childbearing, premarital sex, and in same sex relations was shown in previous researches as well (Elias et al. 2015, Daugherty and Copen 2016).

An important finding relates to gender double standards and prediction of premarital sexual intention: the belief that boys are permitted premarital sex while girls face severe social and religious sanctions influences sexual intentions. Interestingly, greater gender equality attitudes were positively associated with premarital sex, whereas adherence to the double standard was negatively related. The latter aligns with previous research indicating that strict gender double standards tend to suppress premarital sexual activity among women (Zuo et al. 2012, Lefkowitz et al. 2015, Yaşan et al. 2009, Eşsizoğlu et al. 2011). Girls who perceive sexual consequences as equally applicable to both genders are more likely to have engaged in premarital sex, supporting structural theories that link gender equality perceptions with sexual behavior (Beeghley and Sellers, 1986).

The relationship between familial values and peer norms can be understood through the lenses of **symbolic interactionism** and **sexual script theory**. According to these frameworks, girls' sexual behaviors are shaped by familial influences, peers and societal norms (Saftner 2016), operating through culturally embedded scripts—guidelines that prescribe appropriate sexual conduct (Simon 1973). As social independence increases and reliance on family diminishes, young women tend to adopt more modern attitudes and behaviors (Waite, Goldscheider and Witsberger 1986). These progressive attitudes, perceived as interpersonal scripts, are more strongly associated with premarital sexual activity than familial influences, which remain relevant but secondary.

Per **sexual script theory**, perceptions of peers' behaviors, parental expectations, and gender norms serve as collective cultural instructions guiding individual sexual conduct (Gagnon and Simon 2003). These scripts are situational and dynamic, evolving through interpersonal interactions and internal psychological processes. Despite the influence of traditional norms, the findings reveal that many young women now internalize progressive attitudes—reflecting a shift toward modern, individualistic scripts—although familial and societal expectations still exert some influence, often leading to concealment or selective engagement in sexual activity.

From a broader societal perspective, the **network culture model** suggests that factors like the importance of marriage, increasing divorce rates, the significance of virginity, and sexual satisfaction are interconnected and jointly influence young women's attitudes and behaviors regarding premarital sex (Khalajabadi-Farahani et al. 2019, Bachrach 2014). Our findings that higher age is associated with greater sexual experience align with structural theories, emphasizing that growing age and delayed marriage increase opportunities and likelihood of premarital sexual activity (Lagarde et al. 1996, Das and Rout 2023).

The role of religious beliefs appears to be complex: although religion showed an association with abstinence in bivariate analysis, its significance diminishes when accounting for family and social influences, implying that religious transmission occurs primarily through family contexts. This underscores the importance of family relationships in shaping sexual attitudes and behaviors in Iranian society (Kirby et al.

2005, Khalajabadi-Farahani and Cleland, 2011).

In the context of Iranian society—where premarital sex remains socially, legally, and religiously unacceptable—the lack of formal support or health services for sexually active youth heightens their vulnerability to health risks such as sexually transmitted infections, unwanted pregnancies, and unsafe abortions (Khalajabadi-Farahani et al. 2014). Given these realities, understanding the underlying factors that influence premarital sexual activity is vital for designing culturally sensitive interventions aimed at delaying sexual initiation and promoting health.

Conclusion

Our findings highlight that changing perceptions of marriage and sexual attitudes are key elements in understanding premarital sexual behavior among young women in Iran. As societal norms evolve—with increased age at marriage, shifting gender roles, higher education levels, and greater access to sexual information—these changes influence individual trajectories, often within conflicting cultural expectations. The spectrum of attitudes observed—from traditional to highly liberal—reflects ongoing social transformation.

From a policy standpoint, these insights suggest the need for comprehensive, culturally sensitive sex education and support services that acknowledge diverse attitudes, address vulnerabilities, and foster healthier sexual behaviors. These findings also help explain the changes in delayed marriage among younger generations from a demographic perspective. Future research should employ longitudinal designs to better understand causal relationships and include diverse populations, such as males and non-student groups, to develop a more comprehensive view of youth sexual behaviors in Iran. Additionally, demography should take these trends into account to deepen the understanding of marriage dynamics in conservative societies.

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Determinants of Cardiovascular Disease in Sri Lanka: Risk Assessment

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Non-communicable diseases (NCDs) have become a leading public health concern, contributing to significant morbidity and mortality worldwide. Among them, cardiovascular diseases (CVDs) are the most prevalent, accounting for 34% of total deaths in Sri Lanka. This research employs a quantitative research approach to analyze the demographic, behavioral, and socioeconomic factors influencing CVD prevalence in Sri Lanka. Using secondary data from the Ministry of Health and the 2021 Non-Communicable Diseases Risk Factor Survey, the study examines key variables to identify the associated risk. The findings indicate that demographic factors, including age and male sex, significantly increase CVD risk, while higher household income appears to have a protective effect. Regional disparities in CVD prevalence highlight the need for targeted interventions in high-risk areas. Lifestyle factors such as consumption of alcohol, tobacco use, physical inactivity, high salt and sugar intake, and diabetes history emerged as major contributors to CVD risk. The predictive model used in this study demonstrated strong capabilities in identifying high-risk individuals, making it a valuable tool for public health planning. The study underscores the importance of early screening, lifestyle modifications, and region-specific policy interventions to mitigate the growing burden of CVDs in Sri Lanka.

Keywords: *Non-Communicable Diseases (NCDs), cardiovascular disease (CVD), Risk Factors, Sri Lanka, Public Health*

Introduction

Non-communicable diseases, also referred to as chronic diseases, are long-term conditions that progress slowly and are not transmissible between individuals (WHO 2021). The primary categories of NCDs include cardiovascular diseases (e.g., heart attacks and strokes), cancers, and diabetes. These diseases have emerged as leading contributors to morbidity and mortality worldwide, presenting a significant public health challenge. Between 1990 and 2015, NCDs accounted for approximately 41 million deaths annually, constituting 71% of global mortality (WHO 2021). Notably, 16 million of these deaths occurred before the age of 70, with 82% concentrated in low- and middle-income countries. Cardiovascular diseases are the most prevalent and responsible for 17.9 million deaths each year, followed by cancers (9.3 million) and diabetes (1.5 million) (WHO 2021).

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Regions with underdeveloped healthcare infrastructure, such as parts of Africa, exhibit the highest rates of premature deaths due to NCDs. In contrast, developed regions, including North America, Europe, and Australia, demonstrate lower premature mortality rates from these diseases. Sri Lanka, positioned as a middle-income nation, reports intermediate levels of premature mortality due to NCDs. A significant concern is the high rate of premature mortality from NCDs, defined as deaths occurring before the age of 70. The World Health Organization's 2018 country profile indicates that NCDs account for 83% of all deaths in Sri Lanka (WHO 2020)

This surge in NCD prevalence is largely attributed to rapid lifestyle transitions, including changes in dietary habits, reduced physical activity, and increased tobacco use. These modifiable risk factors are strongly linked to the rising NCD burden in the country. Understanding the demographic disparities and factors influencing NCDs in Sri Lanka is crucial for effective health management and policy formulation. This study aims to analyze the trends, patterns, and determinants of NCDs within the Sri Lankan context, and examine the factors affecting NCDs for the management of Health. This type of analysis is essential in developing targeted interventions and allocating resources efficiently to mitigate the impact of NCDs on public health.

Table 1. *Distribution of Deaths by cause in Sri Lanka, highlighting the Significant Impact of NCDs, 2017*

Cause of Death	**Percentage of Total Deaths**
Non-communicable Diseases (NCDs)	83%
- Cardiovascular Diseases	34%
- Cancers	14%
- Diabetes	9%
- Chronic Respiratory Diseases	8%
- Other NCDs	18%
Communicable, Maternal, Perinatal, and Nutritional Conditions	10%
Injuries	7%

Source: World Health Organization, Noncommunicable Diseases (NCD) Country Profiles, 2018.

This data underscores the pressing need for comprehensive strategies to address the NCDs in Sri Lanka, focusing on prevention, early detection, and effective management to reduce the associated morbidity and mortality. Given this context, it is crucial to analyze the trends and patterns of NCD prevalence, along with the underlying determinants influencing their incidence in Sri Lanka.

Literature Review

Sri Lanka's demographic profile, characterized by a life expectancy of approximately 76 years, further underscores the importance of studying NCD trends. Notably, a considerable gender disparity in life expectancy exists, with women outliving men by nearly seven years (Department of Census & Statistics 2016). Historical trends indicate that male and female life expectancy remained comparable until the mid-20th century, after which female longevity increased significantly.

This disparity may be attributed to variations in healthcare access, occupational hazards, lifestyle choices, and environmental factors, including pollution and past conflicts (Ghaffa et al. 2004).

It is essential to first comprehend the definition of CVD. "Cardiovascular disease is caused by disorders of the heart and blood vessels, and includes coronary heart disease (heart attacks), cerebrovascular disease (stroke), raised blood pressure (hypertension), peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure." (World Health Organization 2015).

There are also studies conducted in Sri Lanka to identify the socio-economic factors influencing CVD. A study has been conducted using the micro-level secondary data from Household Income and Expenditure Survey 2016 of Sri Lanka (Abeysekara and Samaraweera 2022). The objective of the study has been to identify the socio-economic factors that affect the prevalence of non-communicable diseases among employed persons. The results revealed that factors of age, being female, and being Indian Tamil persons, positively affected the occurrence of non-communicable diseases; while factors like living in the rural and estate sector, age, being clerical workers, elementary workers, and agriculture workers affected it negatively. Profession-specific policies are further suggested to minimize the negative implications of CVD in Sri Lanka (Abeysekara and Samaraweera 2022).

A cross-sectional community-based study was conducted with 2277 rural adult males aged 20-60 years to detect the periodontal status of male smokers and betel chewers in a rural community in Sri Lanka (Amarasena et al. 2002). Periodontitis is considered as a risk indicator for cardiovascular diseases (Amarasena et al. 2002). The study has identified that oral hygiene and the quantified tobacco use may be considered as risk indicators for periodontitis (Amarasena et al. 2002). The study indirectly indicates how tobacco can be a behavioural risk factor towards the incidence of cardiovascular disease.

In order to understand the individuals' knowledge and awareness on the metabolic factors which affect cardiovascular diseases, a study has been conducted at the Nutrition Clinic of the National Hospital of Sri Lanka (Amarasekara et al. 2015). The study has identified that the participants with high knowledge mean score have significantly lower waist circumference (WC) and showed a trend toward reduced fasting blood glucose levels (Amarasekara et al. 2015). Participants with high practice scores had significantly lower BMI and waist circumference, which signify that better knowledge and practices are associated with decrease in CVD risk markers in these patients (Amarasekara et al. 2015).

Recognizing the complex interplay of factors are essential for formulating effective public health strategies. Literature indicates that demographic, social, and economic and behavioural factors influence CVD outcomes, with significant differences observed in disease prevalence and mortality rates. The analysis of cardiovascular disease history reveals varying prevalence rates across different age groups and genders. In terms of heart disease, the data indicates a consistent increase in prevalence with age for both men and women, with 16.3% of men and 14.8% of women aged 60-69 reporting a history of CVD. To build on this understanding, a rigorous methodological approach is necessary to systematically examine the factors influencing CVD and derive evidence-based insights for public health interventions.

Methodology

The study employs a quantitative research approach to analyze the factors influencing non-communicable diseases (NCDs) specially CVD in Sri Lanka. The methodology section outlines the research design, data sources, analytical techniques, and statistical models used to ensure the validity and reliability of the findings. The study relies on secondary data sources, primarily survey data and health-related records collected at regular intervals, to investigate the prevalence and risk factors associated with selected CVD. By adopting a systematic and ethical research framework, this study aims to generate insights that are both methodologically sound and applicable to a broader public health context.

Data Sources

The data utilized in this study were obtained from the Ministry of Health, Sri Lanka, and the Non-Communicable Diseases Risk Factor Survey conducted in 2021. This survey employed a multi-level cluster sampling method to ensure national representation. The dataset originally contained 133 variables, out of which 15 key variables were selected for analysis. The variables include behavioral, biological, demographic, and socioeconomic, such as alcohol consumption, smoking, diet, physical activity, blood glucose levels, blood pressure, cholesterol levels, BMI, age, sex, ethnicity, education level, and income levels. The selection of these variables was based on their established relevance to NCD risk assessment in global and regional health studies.

Selected Variables and Measurements

Demographic and socio-economic	Province, district, sector, sex, age, education, ethnicity, marital_status, emp_status, household_income
Behavioural	smoking_status, alcohol_status, intake /frequency of fruits, intake /frequency of veg, use of salt, sugar intake, physical activity
Biological/ Metabolic	RPB/hypertension, history of diabetes, raised_cholestrol, history of heart_diseases, systolic_BP, diastolic_BP, heart_rate, BMI, total_cholestrol, FBG

The independent variables were categorized into three main groups: demographic and socioeconomic factors, behavioral factors and biological/metabolic factors. By integrating these diverse factors, the study provides a comprehensive understanding of the multifaceted determinants of CVD prevalence in Sri Lanka.

Statistical Analysis

Study employs both descriptive and inferential statistical techniques to analyze the relationship between risk factors and CVD prevalence. Inferential analyses include chi-square tests, regression modelling, and predictive analytics. Chi-square tests were conducted to examine associations between categorical variables, while binary logistic regression was used to identify significant predictors of CVDs.

To further enhance predictive accuracy, five logistic regression models were developed to assess the factors affecting CVD prevalence. The models were evaluated using key performance metrics, including the Area Under the Curve (AUC), accuracy, specificity, sensitivity, precision, F1-score, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC). The evaluation criteria enabled the selection of the most robust model for predicting CVD risk based on the identified variables. The findings from these models contribute to a data-driven approach to public health management by highlighting key risk factors and potential intervention strategies for reducing the burden of CVD in Sri Lanka.

Binary logistics regression model belongs to the family of statistical models identified as generalised linear models. In the binary logistics regression model, dependent variable is a dichotomous factor variable, which means it always has two levels only. The dependent variable is the prevalence of cardiovascular disease, whether suffering from the disease or not. Apart from the dependent variable it includes of at least one independent variable that is used to explain or predict values of the dependent variable. In summary, the focus of the binary logistic regression is to predict the probability of the levels of the categorical outcomes (Walsh 2016).

Results

As the first step, Chi-square analysis was conducted to examine the associations between various demographic, behavioral, biological, and environmental factors and the prevalence of CVD. The variables included province, sector, age group, sex, education, ethnicity, marital status, employment status, household income, smoking status, alcohol consumption, frequency of fruit and vegetable intake, salt and sugar consumption, physical activity, diabetes history, and environmental factors such as rainfall, temperature, and air quality. The results, presented in terms of p-values, test statistics, and degrees of freedom (df), indicate significant associations for several variables.

Table 2. *Chi-square Test Results for Factors associated with Cardiovascular Disease Risk*

Variable	P_Value	Statistic	Degrees of Freedom
Province	0.022891676	17.78571	8
Sector	0.505769469	1.363349	2
Age Group	< 0.01	41.7977	3
Sex	< 0.01	90.66605	1
Education	0.167404821	7.803466	5
Ethnicity	0.993052138	0.08963	3
Marital Status	0.686115262	0.753419	2
Employment Status	0.061949046	12.00089	6
Household Income	0.003732808	17.44245	5
Smoking Status	< 0.01	431.8241	2
Alcohol Status	< 0.01	476.7911	2
Frequency of Fruits	0.001158841	10.55484	1
Frequency of Vegetables	< 0.01	337.6583	1
Salt intake	< 0.01	65.31228	4
Sugar intake	< 0.01	724.791	2
Physical activity	< 0.01	852.4881	1
History of Diabetes	< 0.01	297.8708	1
Ever Diabetes	< 0.01	231.5809	1
Rainfall	0.213916798	8.344771	6
Temperature High	0.213916798	8.344771	6
Air Quality	0.022891676	17.78571	8

The results of the Chi-square analysis revealed significant associations between several demographic, behavioral, biological, and environmental factors with the prevalence of CVD. Among demographic variables, province ($\chi^2 = 17.79$, $p = 0.0229$) and age group ($\chi^2 = 41.80$, $p < 0.0001$) showed significant associations with CVD prevalence. Individuals aged 50 years and above exhibited a higher prevalence of CVD compared to younger age groups. Sex was also a highly significant factor ($\chi^2 = 90.67$, $p < 0.0001$), with males (33.56%) displaying a markedly higher prevalence than females (21.05%). However, variables such as sector ($\chi^2 = 1.36$, $p = 0.506$), education level ($\chi^2 = 7.80$, $p = 0.167$), ethnicity ($\chi^2 = 0.09$, $p = 0.993$), and marital status ($\chi^2 = 0.75$, $p = 0.686$) did not exhibit significant associations with CVD prevalence. Among socioeconomic factors, household income demonstrated a statistically significant association ($\chi^2 = 17.44$, $p = 0.0037$), with individuals from lower-income households reporting higher rates of CVD. Employment status approached significance ($\chi^2 = 12.00$, $p = 0.062$), suggesting a potential relationship between occupation and CVD risk.

Lifestyle factors such as smoking status ($\chi^2 = 431.82$, $p < 0.0001$) and alcohol consumption ($\chi^2 = 476.79$, $p < 0.0001$) were among the most strongly associated with CVD. Current smokers (49.24%) and past smokers (48.40%) exhibited a significantly higher prevalence of CVD compared to those who never smoked (18.40%). Similarly,

individuals who currently consume alcohol had the highest CVD prevalence (56.24%) compared to non-drinkers (18.73%). Dietary habits also played a crucial role in CVD prevalence. A lower frequency of fruit consumption (less than three days per week) was significantly associated with CVD ($\chi^2 = 10.55$, $p = 0.0012$), with 28.10% of such individuals having CVD compared to 23.65% of those who consumed fruits more frequently. Vegetable consumption showed an even stronger association ($\chi^2 = 337.66$, $p < 0.0001$), where 56.82% of individuals who consumed vegetables less than three days per week had CVD compared to only 21.79% among those with a higher intake. Salt intake ($\chi^2 = 65.31$, $p < 0.0001$) and sugar intake ($\chi^2 = 724.79$, $p < 0.0001$) were also highly significant. Notably, 91.63% of individuals with high sugar intake had CVD compared to only 20.35% among those with low intake. Physical activity emerged as one of the strongest protective factors against CVD, showing a highly significant association ($\chi^2 = 852.49$, $p < 0.0001$). Individuals who engaged in regular physical activity had a significantly lower prevalence of CVD (11.55%) compared to those with a sedentary lifestyle (50.59%). The history of diabetes ($\chi^2 = 297.87$, $p < 0.0001$) and current diabetes status ($\chi^2 = 231.58$, $p < 0.0001$) were also major predictors of CVD. Over 53.71% of individuals with a history of diabetes had CVD, compared to only 21.87% among those without diabetes.

Regarding environmental factors, air quality ($\chi^2 = 17.79$, $p = 0.0229$) demonstrated a significant relationship with CVD, indicating a potential impact of pollution on cardiovascular health. However, variables such as rainfall ($\chi^2 = 8.34$, $p = 0.214$) and temperature variations ($\chi^2 = 8.34$, $p = 0.214$) did not show significant associations.

This study found significant associations between CVD prevalence and several demographic, behavioral, and biological factors. Age, sex, household income, smoking, alcohol consumption, dietary habits (fruit, vegetable, salt, and sugar intake), physical activity, and diabetes history were strongly linked to CVD prevalence. Environmental factors such as air quality also showed a significant impact, whereas other climatic factors like temperature and rainfall were not significant. These findings emphasize the importance of lifestyle modifications and public health interventions in mitigating CVD risk.

Principal Component Analysis (PCA) is an unsupervised learning technique that have been used to reduce dimensionality of data and identify key components influencing disease risk. PCA has been used with the numeric variables of the study such as systolic BP, diastolic BP, heart rate, waist circumference, FBG (fasting blood glucose), BMI, and total_Chol (total cholesterol). The analysis has obtained biplots for PCA to identify the structures and patterns between the variables. PCA has been conducted in the study to obtain a robust understanding on the factors affecting CVDs in Sri Lanka.

The results show that the first principal component (PC1) accounts for 22.3% of the total variance, suggesting it captures the most dominant pattern within the dataset likely driven by key metabolic indicators such as blood pressure, glucose levels, and BMI. The second (PC2) component explain an additional 17.7%, respectively, indicating that other clusters of related risk factors, possibly linked to lipid profiles or behavioral characteristics, also contribute significantly to the overall data structure. Collectively, the first two components explain over 40% of the total

variance, underscoring their capacity to represent the majority of the variability in the original dataset with far fewer dimensions.

To further understand and predict CVD prevalence, five logistic regression models were evaluated for their ability to predict CVD prevalence.

Model 1	Analysed using the full dataset with all the independent variables. Model output indicated that independent variables age, sector, education, wealth group and waist circumference were not statistically significant.
Model 2	Analysed using the full dataset but only with the significant independent variables from the Model 1.
Model 3	Analysed using the full dataset but only with the significant variables from the chi-square test of independence. Model output indicated that independent variable waist circumference was not statistically significant
Model 4	Analysed using the split dataset with all the independent variables. Model output indicated that independent variables age, sector, wealth group, hypertension, DBP and waist circumference were not statistically significant.
Model 5	Analysed using the split dataset but only with the significant independent variables from the Model 5.

The models were assessed using key performance metrics, including Area Under the Curve (AUC), accuracy, specificity, sensitivity, precision, F1-score, Akaike Information Criterion (AIC), and Bayesian Information Criterion (BIC). The table presents the performance metrics for five logistic regression models predicting the prevalence of CVD.

Table 3. *Performance Metrics of Logistic Regression Models for Cardiovascular Disease Prediction*

Metric	Model 1	Model 2	Model 3	Model 4	Model 5
AUC	0.913541042	0.913407111	0.958954063	0.957736589	0.957006
Misclassification Rate	0.136580087	0.136363636	0.106520768	0.09672619	0.09747
Accuracy	0.863419913	0.863636364	0.893479232	0.90327381	0.90253
Specificity	0.937260677	0.93814433	0.94541679	0.941346154	0.940385
Sensitivity	0.65877551	0.657142857	0.735320687	0.773026316	0.773026
Precision	0.791176471	0.793103448	0.815631263	0.793918919	0.791246
F1 Score	0.718930958	0.71875	0.773396675	0.783333333	0.78203
AIC	2980.071388	2975.456597	2055.772485	1480.195307	1480.897
BIC	3224.721087	3200.791846	2280.015098	1691.947597	1686.599

AUC (Area Under the Curve) measures the model's ability to distinguish between classes. Model 3, 4, and 5 (~0.957) performed the best. Misclassification rate is lowest in Model 4 (0.0967) and Model 5 (0.0975). Accuracy is highest in Model 4 (90.33%) and Model 5 (90.25%). Sensitivity (true positive rate) is crucial for detecting CVD cases. Model 4 & 5 (77.3%) performed the best among 5 models. Specificity (true negative rate) is slightly lower in Models 4 and 5 (~94.1%) but still high. Precision (positive predictive value) is slightly higher in Model 3 (81.5%) than Model 4 (79.3%), but Model 4 balances it better with the highest F1-score (78.3%), meaning

it optimally balances precision and recall. Model 4 has the lowest AIC (1480.19) and BIC (1691.95), meaning it is the best-fitting model while penalizing complexity.

Model 4 was selected as the final model for further analysis, as it demonstrated the best trade-off between sensitivity (77.3%) and specificity (94.1%). It also exhibited the highest accuracy (90.33%) and the lowest misclassification rate (9.67%), along with the lowest AIC (1480.19) and BIC (1691.95), indicating an optimal balance between predictive power and model complexity.

Predictors of Cardiovascular Disease

A binary logistic regression analysis was conducted using Model 4 to identify significant predictors of CVD. The dependent variable was CVD prevalence, and the predictor variables included demographic, socioeconomic, lifestyle, dietary, and clinical factors.

Table 4. *Logistic Regression Estimates of Cardiovascular Disease Risk Factors in Sri Lanka*

	Estimate	**Std..Error**	**z.value**	**Pr...z..**
(Intercept)	-1.874485328	0.724513474	-2.58723322	0.009675008
Central	-0.471617202	0.292369783	-1.613084626	0.106726124
Southern	-0.139765155	0.242260508	-0.576920921	0.563992877
Northen	-0.473376249	0.330773038	-1.431121024	0.152395533
Eastern	-0.290112934	0.294378716	-0.985509204	0.324374013
Northwestern	-0.848135206	0.260376734	-3.257338671	0.001124622
North central	0.722139572	0.275188753	2.624160921	0.008686273
Uva	1.368931725	0.287463467	4.762106775	< 0.01
Sabaragamuwa	0.745308859	0.251622201	2.962015493	0.003056324
35-49	0.489891898	0.199036381	2.461318357	0.013842747
50-64	0.66998265	0.197459913	3.393005909	0.000691301
65+	0.638255614	0.279807162	2.281055312	0.022545174
Mae	0.837632409	0.141243854	5.930398987	< 0.01
10,001- 23,500	-0.36617207	0.285145221	-1.284159941	0.199085998
23,501- 36,500	-0.310233864	0.276869122	-1.120507273	0.262497655
36,501- 52,000	-0.309786284	0.275231121	-1.125549624	0.260356201
52,001- 81,500	-0.830938228	0.305958139	-2.715855935	0.006610468
more than 81501	-0.849100577	0.330639038	-2.56805906	0.010226973
Current smoker	-1.951588485	0.20634896	-9.457709316	< 0.01
Past smoker	-0.094266268	0.244796036	-0.385080861	0.700177508
Current	-2.443246634	0.198136039	-12.33115715	< 0.01
Past	-2.610379837	0.239162426	-10.91467367	< 0.01
More than 3 days	-0.254361117	0.155378695	-1.637039862	0.101622141
frequency_veg2	-2.037223734	0.198254442	-10.27580374	< 0.01
Salt lower	0.635108942	0.204492627	3.105779172	0.001897784
Salt higher	1.395494258	0.208853253	6.68169749	< 0.01

Salt highest	1.258815672	0.273822743	4.597191814	< 0.01
higher	0.700417142	1.233573899	0.56779504	0.570174148
Sugar higher	2.821357543	0.242820374	11.61911373	< 0.01
Sugar highest	5.3081139	0.496531328	10.69039071	< 0.01
Physical inactive	-3.48370584	0.177958729	-19.57592003	< 0.01
History of diabetes(positive)	1.526827546	0.18437341	8.281169951	< 0.01
Systolic blood pressure	0.022805312	0.00282255	8.079684034	< 0.01
Waist circumference	0.017241432	0.005629487	3.062700519	0.002193495
Total cholesterol	0.003387117	0.001577735	2.14682249	0.031807416

Demographic and Socioeconomic Factors

Age was found to be a significant predictor, with individuals aged 35–49 (OR = 1.63, p = 0.0138), 50–64 (OR = 1.95, p = 0.0007), and 65+ (OR = 1.89, p = 0.0225) exhibiting higher odds of CVD compared to the reference category. Males had significantly higher odds of developing CVD (OR = 2.31, p < 0.0001) than females.

Geographically, individuals in the North Western Province had significantly lower odds of CVD (OR = 0.43, p = 0.0011), whereas those in the North Central Province (OR = 2.06, p = 0.0087), Uva Province (OR = 3.92, p < 0.0001), and Sabaragamuwa Province (OR = 2.11, p = 0.003) exhibited significantly higher odds. Higher household income was associated with lower odds of CVD, particularly for individuals earning more than LKR 52,000 per month (OR = 0.43, p = 0.0066) and LKR 81,500 per month (OR = 0.43, p = 0.0102), suggesting economic advantages contribute to better cardiovascular health outcomes.

Behavioral and Lifestyle Factors

Smoking and alcohol consumption showed a positive association with CVD prevalence. Current smokers (OR = 0.14, p < 0.0001) and past smokers (OR = 0.91, p = 0.7002) had lower odds of CVD, as did individuals who consumed alcohol currently (OR = 0.09, p < 0.0001) or in the past (OR = 0.07, p < 0.0001). These findings may be influenced by confounding variables, such as age distribution and underlying health conditions.

Physical inactivity was a strong predictor of CVD, with sedentary individuals having significantly higher odds (OR = 32.52, p < 0.0001). This underscores the protective role of regular physical activity in cardiovascular health.

High dietary salt and sugar intake were strongly associated with increased CVD risk. Moderate salt intake (OR = 1.89, p = 0.0019), high salt intake (OR = 4.04, p < 0.0001), and very high salt intake (OR = 3.52, p < 0.0001) were all significant risk factors. Similarly, moderate sugar intake (OR = 16.80, p < 0.0001) and high sugar intake (OR = 201.27, p < 0.0001) substantially increased CVD odds. Conversely, higher vegetable consumption was protective (OR = 0.13, p < 0.0001).

Biological/Clinical Factors

A history of diabetes was a significant predictor of CVD (OR = 4.60, $p < 0.0001$), as were elevated systolic blood pressure (OR = 1.02, $p < 0.0001$), waist circumference (OR = 1.02, $p = 0.0022$), and total cholesterol levels (OR = 1.003, $p = 0.0318$), indicating that metabolic health parameters play a critical role in CVD risk.

The confusion matrix for Model 4 indicated high classification accuracy, with 979 true negatives (TN), 69 false negatives (FN), 61 false positives (FP), and 235 true positives (TP). The model achieved an accuracy of 90.3%, specificity of 94.1%, sensitivity of 77.3%, and a precision of 79.4%, ensuring a balanced identification of both CVD-positive and negative cases. The Receiver Operating Characteristic (ROC) curve analysis confirmed the model's high discriminative ability, with an AUC of 0.958, reinforcing its effectiveness in distinguishing between individuals with and without CVD.

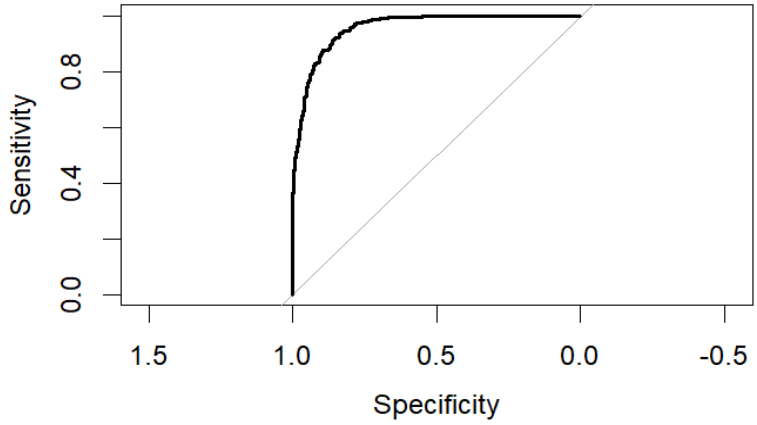
Model Performance Metrics using Test Data

The binary logistic regression model demonstrated strong predictive performance on the testing dataset. An overall accuracy of 82.45% indicates that the model correctly classified a large majority of the instances. The precision (83.46%) and sensitivity (83.25%) values suggest that the model was both reliable in correctly identifying individuals with CVD and effective at minimizing false negatives. The F1 Score (83.35%), which balances precision and recall, further supports the model's robustness in identifying true CVD cases. Most notably, the AUC of 0.8995 signifies excellent discriminatory power, indicating the model's strong ability to distinguish between individuals with and without CVD. These findings validate the model's suitability for predictive risk stratification in public health contexts and support its integration into early screening and intervention strategies.

Table 5. *Performance of RF on Test Dataset for CVD Prediction*

Metric	**Value**
Accuracy	82.45%
Misclassification Rate	17.55%
Precision	83.46%
Sensitivity (Recall)	83.25%
F1 Score	83.35%
AUC (Area Under Curve)	0.8995

Figure 1. *Receiver Operating Characteristic (ROC) Curve of the Outcome*



The results of this study highlight significant demographic, behavioral, and socioeconomic determinants of CVD prevalence in Sri Lanka, emphasizing the interplay between lifestyle choices and disease risk. These findings provide a foundation for a broader discussion on targeted public health interventions and policy recommendations aimed at reducing the national burden of cardiovascular diseases.

Limitations and Future Research

While our models demonstrated high predictive accuracy, several limitations merit discussion. The use of self-reported data introduces potential bias, particularly in smoking, alcohol use, and physical activity. Cross-sectional data also limits causal inference. Environmental variables, although included, showed limited significance possibly due to coarse measurement scales or missing mediators.

Future research should explore longitudinal designs to assess CVD progression and intervention impact. Incorporating biomarkers, genetic data, and real-time behavioral tracking (e.g., through mobile health apps) could enhance model precision. Moreover, extending prediction models to include other NCDs such as chronic respiratory diseases and cancers could offer a more holistic risk assessment platform.

Discussion

The findings of this study highlight significant associations between demographic, behavioral, biological and CVD prevalence. These results align with existing literature that underscores the multifactorial nature of CVD risk.

Age and sex were found to be strong predictors of CVD, with older individuals and males showing significantly higher prevalence rates. This is consistent with previous studies that establish aging as a primary risk factor due to vascular changes, oxidative stress, and cumulative exposure to risk factors over time (Benjamin et al. 2019). Similarly, the higher prevalence in males aligns with prior research indicating

sex-related differences in CVD risk, likely due to hormonal variations and differences in risk behavior such as smoking and alcohol consumption (Virani et al. 2021).

Socioeconomic status, particularly household income, was significantly associated with CVD prevalence, with lower-income groups exhibiting higher rates. This finding aligns with previous studies demonstrating that economic disadvantage correlates with higher exposure to risk factors such as poor diet, limited healthcare access, and higher psychosocial stress (Marmot, 2018). Additionally, geographical variations in CVD prevalence, as seen in this study, may be attributed to differences in healthcare infrastructure, lifestyle patterns, and environmental conditions (Yang et al. 2022).

Lifestyle behaviors, including smoking and alcohol consumption, were strongly linked to CVD risk. Smoking has been extensively documented as a major contributor to CVD through mechanisms such as endothelial dysfunction, increased oxidative stress, and inflammation (Banks et al. 2019). Alcohol consumption also showed a significant association, supporting prior findings that excessive alcohol intake contributes to hypertension, cardiomyopathy, and arrhythmias (Rehm et al., 2017). However, some studies suggest moderate alcohol consumption may have protective effects, which warrants further investigation into drinking patterns and their impact on cardiovascular health (O'Keefe et al. 2018).

The model results highlight marked gender differences in CVD prevalence, consistent with existing global literature indicating higher cardiovascular risk among males compared to females (Lloyd-Jones et al. 2010). The analysis also suggests a complex relationship between alcohol use and CVD outcomes. Although current alcohol consumption is associated with elevated CVD risk in the Sri Lankan population, literature indicates that light-to-moderate alcohol consumption may be cardioprotective under certain circumstances (Ronksley et al. 2011). Given the cultural and behavioral context of alcohol use in Sri Lanka, such protective effects must be interpreted cautiously.

Dietary habits, particularly low fruit and vegetable intake, high salt consumption, and excessive sugar intake, were significant contributors to CVD risk. Numerous studies confirm that diets rich in fruits and vegetables reduce CVD risk by providing essential micronutrients, antioxidants, and fiber that promote cardiovascular health (Aune et al. 2017). High salt intake is a well-known risk factor for hypertension, which in turn elevates CVD risk (Mozaffarian et al. 2018). Similarly, excessive sugar intake, particularly from processed foods and sugary beverages, has been linked to obesity, metabolic syndrome, and insulin resistance, all of which contribute to CVD (Te Morenga et al. 2013).

Physical activity emerged as a crucial protective factor against CVD. The strong association between physical inactivity and CVD observed in this study is well supported by previous research demonstrating that regular exercise enhances cardiovascular function, reduces blood pressure, and improves lipid profiles (Lee et al., 2012). This underscores the importance of promoting physical activity as a key public health intervention to mitigate CVD risk.

Diabetes history was another major predictor of CVD, reinforcing the well-established link between diabetes and cardiovascular complications. Diabetes contributes to CVD through mechanisms such as hyperglycemia-induced vascular

damage, increased inflammation, and dyslipidemia (Einarson et al. 2018). Effective management of diabetes is thus essential in reducing CVD burden.

Overall, these findings emphasize the importance of targeted public health strategies to address modifiable risk factors such as unhealthy diets, smoking, and physical inactivity. Further longitudinal research and interventional studies are necessary to establish causality and explore effective measures to mitigate CVD risk at both individual and population levels.

Conclusion

Demographic factors such as age and male sex significantly increased CVD risk, while higher household income appeared protective. Regional disparities in CVD prevalence were observed, with some provinces exhibiting significantly higher or lower risk levels. Lifestyle factors, particularly physical inactivity, high salt and sugar intake, and a history of diabetes, were major risk factors. Smoking and alcohol consumption showed a positive association with CVD prevalence. The model demonstrated strong predictive capabilities, making it a valuable tool for identifying high-risk individuals and informing public health interventions in Sri Lanka.

The findings emphasize the importance of early screening and intervention strategies, particularly in high-risk regions. Strengthening healthcare infrastructure and promoting community-based health initiatives could help mitigate the growing CVD burden. Further implementing educational programs focusing on lifestyle modifications, including physical activity, reduced salt and sugar intake, and diabetes prevention. Strengthening local health services and promote grassroots-level interventions to encourage healthier lifestyles and enforcing stricter regulations on processed foods high in salt and sugar and promote workplace wellness programs to reduce sedentary behavior would aid prevent the condition in future.

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Evaluating the Effectiveness of Implementation Strategies to End Child Marriage in Kogi State, Nigeria

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The study assesses the effectiveness of multi-sectoral strategies aimed at ending child marriage in Kogi State, Nigeria. Utilizing both primary and secondary data, the study synthesized government policy frameworks, international reports, academic literature, and qualitative data from key stakeholders, including adolescent girls, community leaders, educators, and policymakers. Data collection involved purposive sampling, with in-depth interviews and focus group discussions analyzed thematically using NVivo 8.0. Findings reveal that several initiatives have yielded positive outcomes. Health-focused programmes such as the Maternal, Newborn, and Child Health Week (MNCHW) expanded access to essential services in underserved communities, indirectly addressing child marriage drivers. Capacity-building initiatives, free medical testing, and life skills education, particularly under the Participation Initiative for Behavioural Change in Development (PIBCID), enhanced women's health literacy and autonomy. Educational interventions like the Girl-Child Education Support Programme (GCESP) improved school enrollment through scholarships, delaying early marriage among beneficiaries. Legal reforms such as the enactment of the Violence Against Persons Prohibition (VAPP) Law and the establishment of specialized courts have strengthened the legal framework against child marriage, while community-based awareness campaigns have improved rights literacy and social support for girls' education. Cultural practices, such as the Ovia-Osese Festival, were also observed to reinforce norms that discourage early marriage, though concerns around human rights compliance were noted. Despite progress, challenges persist, including sustainability of programmes, funding limitations, inadequate infrastructure, cultural resistance, and uneven enforcement of laws in rural areas. The study underscores the need for sustained, context-sensitive, and scalable interventions that address the socio-cultural and economic root causes of child marriage. Strengthening cross-sector collaboration and ensuring community ownership are essential to achieving long-term impact.

Keywords: *Child Marriage, Kogi State, Intervention, Impact, Challenges*

Introduction

Child marriage continues to be a critical global human rights and public health concern, disproportionately impacting girls in low- and middle-income nations. Annually, around 12 million girls worldwide are married before reaching 18 years

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of age (UNICEF 2021). This practice, entrenched in gender inequality, poverty, cultural norms, and inadequate legal protections, frequently undermines girls' education, exacerbates the risks of gender-based violence, and elevates maternal and infant death rates (Walker 2012). Notwithstanding international and national commitments such as the United Nations Sustainable Development Goal 5.3, which advocates for the eradication of all detrimental practices, including child marriage advancement has been sluggish and inconsistent, especially in Sub-Saharan Africa [SSA] (UN Women 2020).

In Nigeria, a nation with a significant prevalence of child brides, the practice endures due to intricate interactions of tradition, religion, economic adversity, and deficiencies in governmental enforcement. The problem is particularly severe in areas like Kogi, where child marriage rates persistently stay elevated despite initiatives by governmental and non-governmental organizations to mitigate the practice (Girls Not Brides 2023). The health concerns linked to child marriage are significant. Early pregnancies in child brides may lead to difficulties like obstetric fistula, preterm birth, and low birth weight children. The mental health of child brides is negatively impacted, resulting in heightened occurrences of depression, anxiety, and post-traumatic stress disorder owing to early marriage and ensuing abuse or neglect. This psychological trauma is exacerbated by social isolation and inadequate support systems. These health challenges are reflected in India, where early marriage correlates with elevated maternal and newborn mortality rates. Child marriage economically constrains women's access to employment and financial autonomy. Child marriage correlates with elevated maternal and child mortality rates, obstructed socioeconomic advancement, and increased incidences of divorce and societal discord.

Despite the implementation of diverse interventions such as community sensitization, educational initiatives, and legal reforms, their efficacy is frequently undermined by suboptimal design, insufficient contextual adaptability, and deficient monitoring methods. In Kogi State, initiatives to mitigate child marriage have frequently been disjointed, reliant on external funding, and deficient in enduring sustainability or local customization. It is essential to advance from descriptive studies of prevalence and cause to research that assesses the processes, fidelity, and scalability of both existing and innovative therapies. This encompasses comprehending the operationalization of policies, the engagement of local stakeholders with anti-child marriage initiatives, and the contextual elements that affect implementation results.

The study is essential for formulating effective, context-specific strategies to address detrimental habits. It aims to comprehend the efficacy of treatments, the target populations, the contextual factors, and the methods for sustainably scaling successful strategies (Peters et al. 2013). In Kogi State, implementation study on child marriage might reveal structural obstacles to existing tactics and pinpoint avenues for more effective, scalable, and contextually suitable solutions. This study aims to reconcile policy aspirations with practical realities, so facilitating the expedited efforts to eradicate child marriage. The study offers evidence-based insights that can guide policy formulation, improve resource distribution, empower communities, strengthen monitoring and evaluation, and promote cultural change, ultimately aiding in the elimination of child marriage in the state.

Statement of the Problem

Child marriage persists as a widespread and deeply rooted problem in numerous regions of Nigeria, especially in Kogi State, where socio-cultural norms, economic hardship, and gender inequity converge to perpetuate the practice. Notwithstanding national legal frameworks like the Child Rights Act of 2003, which establishes the minimum legal marriage age at 18, and various international commitments, including Sustainable Development Goal 5.3 aimed at eradicating harmful practices such as child marriage, tangible progress in Kogi State has been slow and erratic (UNICEF 2020, Girls Not Brides 2023).The existing literature predominantly examines the causes and effects of child marriage in Nigeria, identifying poverty, insufficient education, religious and cultural views, and gender norms as significant factors (Afolayan 2019, Eze 2021). Research has recorded the detrimental impacts on females, encompassing heightened health risks (e.g., obstetric fistula, maternal death), school attrition, and vulnerability to gender-based violence (Okafor and Odu 2020). Nonetheless, a significant deficiency persists in converting this information into efficient and sustainable programming initiatives, especially from the perspective of implementation research.

Eboh's (2020) study elucidated the socio-economic ramifications of child marriage in Anyigba, Dekina Local Government Area of Kogi State, demonstrating that early marriage adversely affects health, education, and economic prospects for young females. The Participation Initiative for Behavioural Change in Development (PIBCID/NWTF), in partnership with the Medical Women's Association of Nigeria (MWAN), initiated a capacity-building and complimentary medical testing program in Kogi State to address gender-based violence (GBV) and early child marriage. Notwithstanding these initiatives, the continued prevalence of child marriage in Kogi State highlights the necessity for focused implementation study.

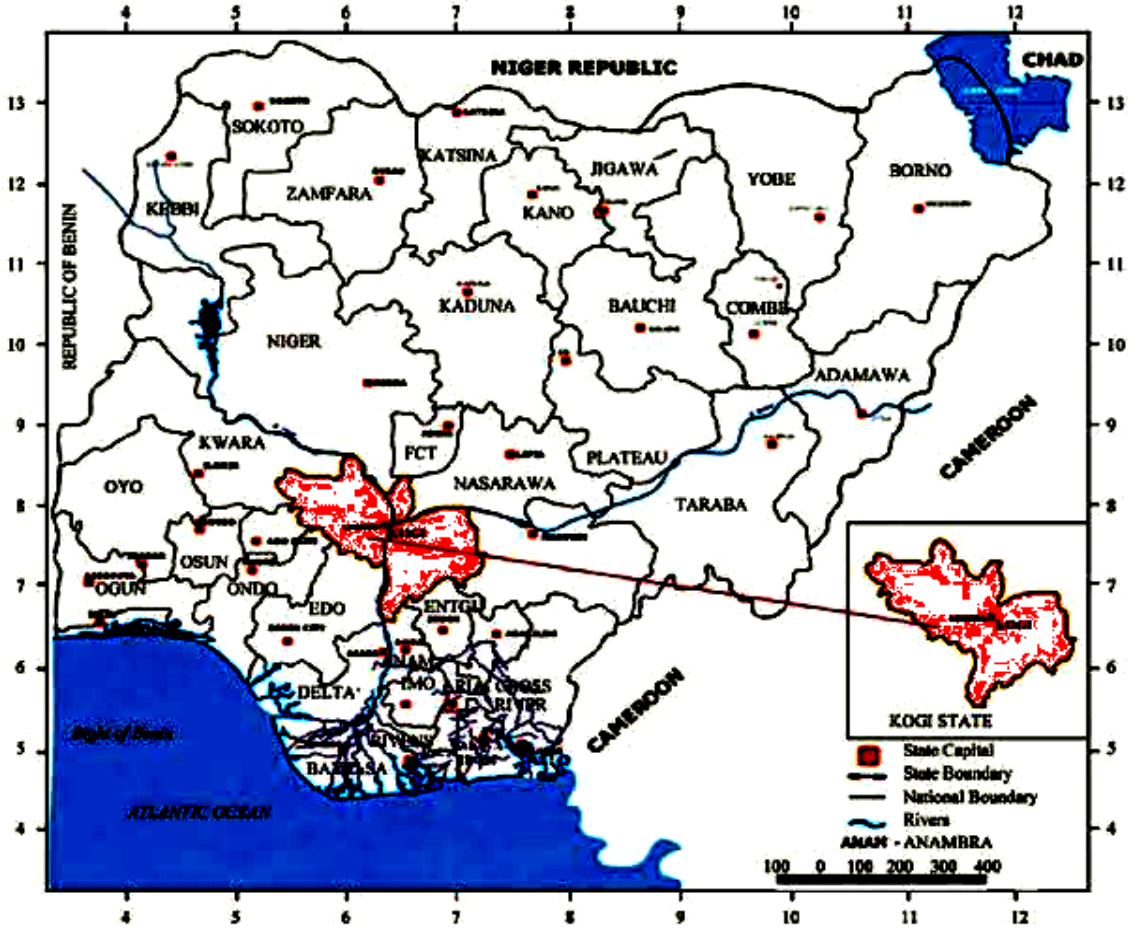
Moreover, although many states in Nigeria (e.g., Ekiti, Lagos) have implemented and assessed anti-child marriage initiatives with quantifiable results, qualitative policy related studies remain little researched in this context. Most previous studies have depended on cross-sectional surveys and minimal qualitative interviews, exhibiting a restricted geographic scope and little interaction with systems-level dynamics (Olawale and Ibrahim 2022). This study utilizes qualitative methods to examine the effectiveness and sustainability of interventions aimed at eliminating child marriage in Kogi State. The study distinguishes itself from previous studies by transitioning from problem identification to solution evaluation. The emphasis is on the success and failures of programmes currently being implemented in Kogi State. Thus, the study pinpoints obstacles to success, and guide the formulation of context-specific policies to eliminate child marriage.

Materials and Methods

Study Area

Kogi State, situated in Nigeria's central area, is commonly known as the "Confluence State" since it is at the junction of the Niger and Benue rivers. It is situated roughly between latitudes 6°30′N and 8°50′N and longitudes 5°20′E and 7°40′E, encompassing a land area of approximately 29,833 square kilometres (See figure 1). It borders ten other Nigerian states, including the Federal Capital Territory to the north, as well as Edo, Ondo, Ekiti, Kwara, Niger, Enugu, Anambra, Nasarawa, and Benue, establishing it as a strategic transit and economic corridor within the nation (National Population Commission [NPC] 2006).

Figure 1. *Nigeria showing Kogi State*



Source: Kogi State Ministry Lands and Urban Development, 2025.

The state has a tropical climate with two distinct seasons: the rainy season from April to October and the dry season from November to March. Annual precipitation varies from 1,100 mm to 1,500 mm, with humidity levels typically elevated throughout the rainy season. Temperatures generally fluctuate between 22°C to 35°C, with the peak heat being from February to April (Nigerian Meteorological

Agency [NiMet] 2020). Kogi State is abundantly supplied with rivers, the most notable being the Niger and Benue, which meet at Lokoja, the state capital. In recent years, floods have intensified due to climate change and inadequate environmental management, impacting thousands of citizens and inflicting considerable damage on infrastructure and crops (Federal Ministry of Environment [FME] 2021, Adefolalu 2007)

Kogi State has an estimated population over 4.5 million, consisting of many ethnic groups, including the Igala, Ebira, and Okun (a subset of the Yoruba). The state exhibits linguistic and cultural diversity, with main communities primarily located in the eastern, central, and western regions, respectively. Lokoja, the capital, is a cosmopolitan city of historical importance, having served as the inaugural administrative capital of contemporary Nigeria (NPC 2006). Kogi State's economy is predominantly agrarian, with most of the populace involved in agriculture, fishing, and small-scale commerce. Principal crops are yam, cassava, maize, rice, and cashew. Besides agriculture, the state possesses abundant mineral resources, including coal, iron ore, and limestone, which are, however, underutilized. The existence of the Ajaokuta Steel Complex underscores the state's industrial potential. Notwithstanding these resources, unemployment and poverty persist as issues, intensified by insufficient infrastructure and restricted access to credit and markets (National Bureau of Statistics [NBS] 2021).

While there is evidence of decline nationally, state-level analyses reveal that Kogi State remains among those with persistently high rates of child marriage, even after multiple interventions and policy enactments. Moreover, in Kogi, local studies such as that in Anyigba, Dekina LGA, show that socio-economic deprivation, illiteracy, poverty, and rural location continue to drive early marriage practices, and that existing interventions may not sufficiently address these contextual determinants. Given that Kogi has existing government commitments (including policies on gender-equality in education), stakeholder initiatives, and ongoing capacity building, it is especially well suited for a study that aims to evaluate the effectiveness of implementation strategies, rather than simply document prevalence or impacts. Therefore, this study highlights how well specific strategies, interventions, or policies achieve their intended outcomes in reducing or ending child marriage in Kogi State.

Methods

To properly execute implementation research aimed at eradicating child marriage in Kogi State, a synthesis of primary and secondary resources is essential. Relevant materials comprise government policy documents, including the Child Rights Act of 2003, implementation frameworks from the Kogi State and Federal Ministries of Women Affairs and Social Development, as well as reports from international organizations such as UNICEF and UNFPA. Moreover, current academic literature, program assessments, and statistics reports from the National Bureau of Statistics (NBS) establish a foundation for comprehending prevalence, determinants, and intervention strategies (UNICEF 2020). Primary data collecting tools, including key informant interview guides and focus group discussion protocols, were utilized to obtain firsthand knowledge from stakeholders.

Purposive sampling was adopted to select community leaders, parents, educators, and policymakers who possess expertise or direct involvement in initiatives combating child marriage. Thereafter, stratified sampling was utilized to interview participants based on age and gender. In-Depth interviews focused on the efficacy of programmes initiated by the Kogi State government to eradicate child marriage, along with their impacts and challenges. The data were obtained from adolescent girls, governmental institutions, non-governmental organizations (NGOs), traditional leaders, and community-based organizations involved in policy implementation.

The research examines adolescent females aged 18, community stakeholders, and policy enforcers. Contextual variables regarding attitudes and cultural norms were also considered.

Six field assistants were trained in conducting interviews and documenting the proceedings. The interviews were documented using a tape recorder. Prior to the initiation of the interview, the interview guide was distributed to each participant to enable them to familiarize themselves with the topics and get supplementary knowledge that they may not possess readily. The participants were informed about the topic, procedure, and duration of the activity. The interview was structured to permit flexibility and to investigate additional aspects pertinent to the subject matter. In addition to the recording device, the researcher also took notes. This was executed to guarantee that all issues addressed were thoroughly documented. The recorded interviews were processed, and their contents were analyzed under various headings pertinent to the subject matter.

This study's data modeling entails structuring acquired data into variables that represent the multifaceted dimensions of programmes implemented to reduce child marriage. Variables encompass programmes implemented, impacts of programmes, life skill acquisition, awareness of programmes, and policy outreach. The qualitative data gathered through interviews were used to unravel intricate successes and implementation obstacles, as well as the lived experiences of adolescent girls. All instruments underwent pre-testing for reliability and validity prior to deployment. The data analysis process encompasses the transcription and coding of qualitative responses for thematic content analysis. Thematic analysis was employed to discern reoccurring patterns and themes, aided by technologies such as NVivo version 8.0. The triangulation of data improved validity and facilitates a thorough comprehension of implementation efficacy (Creswell and Plano Clark 2018).

Results

Healthcare Services and Capacity-Building Training

The Kogi State Government launched the Maternal, Newborn, and Child Health Week (MNCHW) to provide essential healthcare services to women and children, including immunization, vitamin A supplementation, and deworming. This initiative aims to reduce maternal and child mortality rates, indirectly addressing factors that contribute to child marriage. The programme has produced several positive outcomes. A Director in the Kogi State Ministry of Health reported that: "MNCHW

has increased access to essential health services. Services such as immunization, vitamin A supplementation, deworming, antenatal care, malaria prevention, HIV counselling/testing, family planning, nutritional screening have been delivered to many mothers and children. There is expanded coverage of vitamin A supplementation. For example, in one round in 2017, 1,387,808 children aged 6 to 59 months received vitamin A, which was 97 percent of eligible children in Kogi State. Because MNCHW includes both fixed facility-based sessions and outreach/house-to-house components, it helps reach remote and underserved areas beyond what usual health centres might do." (Male respondent, Director, Kogi State Ministry of Health, March 2025).

There are concerns about sustainability and continuity. MNCHW is a periodic, bi-annual or week long burst of intervention. Routine services and follow ups may not always be sustained at the same level. Health education, follow up of malnourished children, antenatal care after the event, etc., need ongoing attention. Dependence on external partners, supplies, funding can lead to disruptions. Interruptions in funding or supply can affect service delivery.

In collaboration with the Medical Women's Association of Nigeria (MWAN), the Kogi State Government launched a capacity-building training and free medical testing campaign in Osisi, Ujagba, and Okpachala communities. The initiative was organised under the Participation Initiative for Behavioural Change in Development (PIBCID). The programme explicitly links health sensitization and testing with efforts to reduce gender-based violence and early child marriage. By building capacity and awareness, women are better informed about their rights, risks, and support structures.

The programme has empowered women with knowledge and skills to manage health effectively. Participants in the communities were educated on health issues including viral infections (HBsAg/HCV), malaria via Instant Malaria Test (IMT), plus hypertension, etc. This awareness helps women recognize symptoms early, understand risks, and seek medical care more promptly. Also helps demystify certain health conditions and reduce stigma. In shedding light on the success of the project, a female respondent stated: "The project provided free tests for malaria, hepatitis B, and hepatitis C. Access to these tests in underserved rural communities has led to early detection which can improve treatment outcomes and reduce the burden of disease" (Female Respondent, Director, Kogi State Ministry of Women Affairs and Social Development, March 2025).

By combining capacity building (training) with medical interventions, women gained both knowledge and practical access. This dual approach helps shift power in communities. A major concern is the sustainability and scalability of the initiative in other communities. Such initiatives often depend heavily on external funding (here via Ford Foundation/NWTF). If that funding lapses or reduces, maintaining free services, tests, and outreach becomes difficult. Regular monitoring, supplies (test kits, medical materials), trained personnel, logistic support, all need continuous resources.

Free testing is useful but unless there is effective system for treatment, follow-up, referrals, and managing chronic conditions, the benefit may be limited. E.g. identifying hypertension is good, but do people get medications? Hence, knowledge/awareness must be reinforced over time as one-off trainings may lose effect. The PIBCID/NWTF 2024 initiative is a good but its impact will depend on

how well the programme deals with sustainability, ensures ongoing access to services (not just testing), measurements of outcomes over time, and scaling without losing quality or community relevance.

The Kogi State Government has provided educational scholarships for girls in the state. The Director of the Kogi State Ministry of Women Affairs and Social Development asserted that: "The education and scholarship initiatives were organized under the Girl-Child Education Support Programme (GCESP), a collaborative effort involving the Kogi State Government and development partners such as Girls' Power Initiative (GPI), Plan International Nigeria, Women's Rights Advancement and Protection Alternative (WRAPA), and UNICEF Nigeria". The programme was primarily implemented between 2024 and 2025, with key activities reported in these years. A female respondent in the Kogi State Ministry of Education disclosed that:

> "This programme aimed to address the persistent challenges of low school attendance and early marriage among girls in Kogi State. Through the provision of scholarships that covered tuition and other educational expenses, the initiative succeeded in encouraging school enrollment and retention among girls, particularly in rural and underserved communities". (Female respondent, Director, Kogi State Ministry of Health, March 2025).

By reducing the financial burden on families, the programme provided a strong incentive to keep girls in school, which in turn contributed to delaying early marriages. Furthermore, the involvement of multiple NGOs brought in technical expertise, community engagement strategies, and advocacy tools that enhanced awareness and mobilized local support for girls' education.

Despite these successes, the programme faced several limitations. Chief among them was limited funding, which restricted the number of beneficiaries and the geographical scope of implementation. The scholarships, while impactful, did not reach all the communities in need, and many girls in remote areas continued to face barriers to education. Additionally, the programme's lack of sustainability mechanisms such as integration into broader state education policy or guaranteed multi-year funding meant that some of its gains were difficult to maintain over time. Cultural resistance in certain communities and inadequate infrastructure in some schools (such as lack of female teachers or sanitary facilities) also hindered the full realization of the programme's objectives.

Advocacy and Awareness Campaigns

The Kogi State Government has intensified efforts for advocacy and awareness campaigns to end child marriage. Since 2018, the Kogi State Government, through its Ministry of Women Affairs and Social Development and the Child Rights and Child Protection Programme (CRCPP), has spearheaded extensive advocacy campaigns aimed at ending child marriage and promoting girls' education. Utilizing diverse media platforms such as radio, television, and social media, alongside grassroots outreach, these campaigns have significantly heightened public awareness of the dangers of child marriage. An 18-year-old teenager from Okene Local Government Area disclosed that: "As a girl residing in Kogi State, I recognize that I possess rights

intended to safeguard me from practices such as early or forced marriage". (An 18-year old female respondent from Okene, March, 2025)

The girl's claim of her awareness regarding her rights indicates a commendable level of legal literacy. This can constitute protection against child marriage. The response from the girl is a testament to the fact the that due to the advocacy and awareness campaigns, communities and families have been empowered to challenge harmful cultural norms, resulting in increased community engagement and support for girls' education. Consequently, school enrollment and retention rates among girls have improved, and local governments have been encouraged to adopt stronger legal protections for children. However, challenges remain, particularly in rural areas where traditional beliefs and economic hardships continue to influence early marriage practices. These advocacy efforts thus represent an important step towards the long-term eradication of child marriage in Kogi State, though sustained commitment is necessary to overcome persistent obstacles.

Legal Reforms and Policy Implementation

Further, the Kogi State Government's enactment of laws and policies aimed at prohibiting child marriage and protecting the rights of girls is part of a broader initiative to combat gender-based violence (GBV) and child abuse. This initiative is supported by enforcement mechanisms to ensure compliance. In 2022, the Kogi State Government signed into law the Violence Against Persons Prohibition (VAPP) Law, which criminalizes various forms of violence, including child marriage. Additionally, a dedicated GBV Directorate was established in 2024 to oversee the implementation of these laws and coordinate efforts to address GBV and child abuse across the state. The implementation of these legal frameworks has led to several significant outcomes, including establishment of specialized courts, capacity building and awareness campaigns, and rescue and prosecution efforts. A social worker in the Ministry of Women Affairs and Social Development disclosed that: "The state government has set up nine family courts to handle GBV cases, ensuring swift and specialized adjudication of such matters. Through partnerships with organizations like ActionAid Nigeria and the Participation Initiative for Behavioural Change in Development (PIBCID), the government has conducted training programmes for social welfare workers and community members. These initiatives aim to enhance the response to child abuse and promote awareness of legal protections. Also, the government has rescued 39 abandoned babies and prosecuted 15 individuals involved in child abuse cases, including early marriage and violence-related offenses". (Male respondent, Director, Kogi State Ministry of Women Affairs and Social Development, March 2025).

These efforts reflect Kogi State's commitment to safeguarding the rights of girls and ensuring that legal protections against child marriage are effectively enforced. However, despite these achievements, challenges remain. Enforcement is uneven, particularly in rural areas where traditional customs and social norms still support early marriage. Limited resources and gaps in infrastructure hinder the consistent application of the law, and there are instances where victims and their families face stigma or pressure not to pursue legal remedies. Additionally, awareness about the new legal provisions is not yet universal, which limits the

law's deterrent effect. These challenges highlight the need for ongoing education, community engagement, and increased funding to ensure the reforms translate into lasting change on the ground.

Reinforcement of Cultural Values

The reinforcement of cultural values through the celebration of festivals that promote chastity encourages young girls to maintain their purity before marriage. For instance, the Ovia-Osese Festival is an annual cultural event in Ogori community that celebrates the initiation of virgins into womanhood. The annual celebration of the Ovia-Osese Festival reinforces cultural values that discourage early marriage. A community leader succinctly captured the significance of the Ovia-Osese Festival: "It keeps alive Ogori traditions and forms of social identity. The rite, the dances, the music, the public recognition of maidens all reinforce shared values and communal memory. It promotes moral messaging and social discipline". By celebrating chastity and purity before marriage, the festival encourages sexual abstinence among the young, discourages early sexual activity (which can have public health implications) and may reduce risks such as teenage pregnancy. The festival draws together elders, families, youth, and the diaspora; it reinforces intergenerational ties and communal pride. It also offers a platform for social interaction, talent shows, health programmes, debates etc".

However, there are limitations and tensions concerning the Ovia-Osese festival. A major challenge lies in balancing traditional practices with modern human rights concerns. The requirement of virginity for participation could be challenged under rights to bodily autonomy, non discrimination, and privacy. The pressure on young girls to prove chastity has led to stigmatization of those who do not meet the criteria (for whatever reason). Modern norms around women's rights see this as restrictive. There is risk that in its enforcement or in social pressure, the festival contributes to secrecy, shame, or ignoring health education (e.g. regarding safe sex, or the possibility that some girls may have lost virginity for reasons out of their control). Also, the physical demands of the initiation rites sometimes conflict with schooling or other commitments.

Life Skills and Development Mechanisms for Girls and Boys

The Kogi State Government implemented skills acquisition and vocational training programs for out-of-school girls and young mothers to address the underlying factors of child marriage, including as poverty and gender inequity. The government is collaborating with NGOs to boost girls' savings groups, mentoring programs, and leadership activities. Boys and men are being enlisted as allies to transform detrimental gender norms and attitudes via focused behavioural change communication initiatives. The Ministry of Women Affairs and Social Development is collaborating with the Ministry of Education to further the "Safe Schools" project, which aims to extend girls' educational tenure while integrating sexual and reproductive health education, mentorship, and rights awareness into the curriculum. A Director in the Ministry of Women Affairs and Social Development stated: "We are currently expanding safe

spaces for girls at risk of child marriage. These centres offer interim accommodation, counselling, and life skills training while longer-term solutions are arranged. The Ministry promotes conditional cash transfer programmes and empowerment initiatives for at-risk households to tackle the economic factors contributing to child marriage. We connect families to government and donor-funded poverty alleviation programmes".

Table 1 delineates the life skills pertinent to the cessation of child marriage. The table utilises frameworks from UNICEF (2019), WHO (2003), and UNFPA (2016) regarding life skills education, critical thinking, and sexual and reproductive health and rights as vital instruments for preventing early marriage and fostering youth empowerment. These life skills encompass psychosocial competencies and interpersonal abilities that enable individuals to make informed decisions, solve problems, engage in critical and creative thinking, communicate effectively, cultivate good relationships, and manage their lives in a constructive and healthful manner.

Key life skills relevant to ending child marriage in Kogi State include:

Category	**Specific Skills**
Decision-making & Problem-solving	Choosing alternatives to early marriage, setting life goals
Critical Thinking	Challenging social norms around early marriage
Communication & Negotiation	Assertiveness in saying "no," conflict resolution
Self-awareness & Empathy	Understanding one's rights and recognizing others' perspectives
Coping with Emotions & Stress	Handling peer pressure, dealing with trauma or coercion
Health Literacy	Knowledge of SRHR (Sexual and Reproductive Health and Rights), consent, menstruation, and hygiene
Financial Literacy	Budgeting, saving, vocational and entrepreneurial skills

Gender-specific skills are crucial for enabling girls and boys to make informed decisions and develop resilience against child marriage. Empowerment via education is essential for girls. Females frequently encounter educational disparities. Life skills must encompass study habits, career preparation, and knowledge of legal rights pertaining to early marriage (Sabiny Transformation Initiative 2024). Girls require education regarding puberty, consent, contraception, and health services related to sexual and reproductive health (SRH). This skill will enable girls to make educated choices, assert their rights, and obtain essential health treatments. Training in self-confidence and assertiveness can empower females to refuse unwanted approaches or arranged marriages. Understanding how to seek assistance when at danger of early marriage can represent safety and reporting competencies.

Likewise, SRH education is essential for males to comprehend the detrimental effects of child marriage on both genders (UNESCO 2024). They must comprehend consent, reproductive rights, and collective accountability in averting early pregnancy. Boys require life skills that promote respectful gender interactions and deter

detrimental practices. Instructing boys to regard girls as equals diminishes their capacity as facilitators or offenders of child marriage, fostering empathy and promoting gender equality. Training boys to serve as peer educators or champions against child marriage within their communities helps foster their perception as stakeholders in the battle against this issue. Nonetheless, deficiencies are there in the existing approach for life skills education in Kogi State. These encompass restricted access to life skills education in rural regions; absence of gender-specific programming; cultural opposition to subjects such as family planning, reproductive health, and gender equality; inadequate training for teachers and mentors; and poor integration into school curricula and informal community initiatives.

Discussions

The findings provide important insights into the effectiveness and limitations of the MNCHW interventions in enhancing access to essential health services, particularly for women and children. One notable success is the impressive vitamin A supplementation coverage in 2017, where 97% of eligible children (1,387,808 aged 6-59 months) received the supplement, highlighting the programme's reach and operational efficiency (Director, Kogi State Ministry of Health, personal communication, March 2025). The dual delivery strategy of the MNCHW through both fixed facility-based and outreach/house-to-house components has proven effective in reaching remote and underserved populations. This approach helps bridge the gap created by geographical and infrastructural challenges that often hinder access to health services in rural or marginalized areas (Director, Kogi State Ministry of Health 2025). These findings align with earlier studies, such as those by Odusanya et al. (2019), who noted that targeted outreach strategies in maternal and child health interventions can significantly improve service uptake and health outcomes in underserved communities.

However, the findings also underscore pressing concerns regarding sustainability, continuity, and systemic dependency. Since MNCHW operates as a periodic intervention, typically bi-annual or week-long—it does not substitute for sustained, routine health service delivery. Services like antenatal care, nutritional follow-up, and health education require consistent and ongoing engagement, which the MNCHW alone cannot provide. This gap raises the risk of losing the gains achieved during the campaign periods if routine health services remain weak or poorly coordinated (Director, Kogi State Ministry of Health 2025). Furthermore, the dependence on external partners, such as WHO and UNICEF, for supplies and funding introduces a layer of vulnerability. Interruptions in donor support or national-level supply chains can disrupt service delivery, undermining the effectiveness of the intervention.

Another key issue is the persistent need for improved community engagement and behavioral change. While the MNCHW can deliver services effectively, their uptake depends heavily on community trust, awareness, and willingness to participate. Social and cultural beliefs, logistical challenges, and even indirect costs (e.g., time off work, transport) may deter participation, even when services are free (Director, Kogi State Ministry of Health 2025). This concern is echoed in the work of Fagbamigbe et

al. (2020), who emphasized that health intervention success in Nigeria is often limited by low health literacy, cultural resistance, and infrastructural barriers.

The implications of the recent capacity-building training and free medical testing campaign carried out by the Kogi State Government in collaboration with the Medical Women's Association of Nigeria (MWAN) extend beyond healthcare and touch significantly on broader social issues, including the elimination of child marriage in Kogi State. At its core, the initiative not only addressed the health needs of underserved rural communities in Osisi, Ujagba, and Okpachala but also served as a platform for engaging women and families on critical issues affecting girls and young women. By providing free access to healthcare services and involving the Ministry of Women Affairs and Social Development, the project reinforced the importance of women's and girls' well-being, which is intrinsically linked to efforts aimed at ending child marriage.

Moreover, the presence of trained health professionals, particularly female practitioners through MWAN, created role models for girls in these communities. When young girls see women in leadership and professional roles, it challenges traditional gender norms and expands their understanding of what is possible beyond early marriage. The visibility of successful, educated women in positions of influence helps to shift community attitudes and aspirations for girls. In addition, the involvement of the Ministry of Women Affairs and Social Development provided an avenue for integrating child protection messaging into the campaign. While the primary focus was on health, the structure of the initiative allowed for broader discussions on girls' rights, including the legal and social consequences of child marriage. These integrated approaches, where health interventions are coupled with social advocacy, have been shown in previous development frameworks to be more effective in addressing complex, deeply rooted issues like child marriage.

Comparatively, earlier anti-child marriage efforts in Kogi State and similar regions in northern Nigeria often faced challenges due to weak community engagement or lack of integrated service delivery. What sets this recent initiative apart is its community-based approach, its focus on inclusion, and the provision of immediate, tangible benefits (i.e., free testing), which helped to build trust and open up space for dialogue on sensitive issues like child marriage.

The establishment of the Girl-Child Education Support Programme (GCESP) represents a collaborative, multi-stakeholder approach that directly targets the root causes of child marriage; namely, poverty, lack of access to education, and entrenched gender norms. The programme was designed to mitigate low school attendance and early marriage by offering scholarships that covered tuition and other associated educational costs. This approach appears to have positively influenced enrollment and retention rates among girls, especially in rural and marginalized areas. When compared to earlier efforts in the state and similar interventions in Nigeria, the GCESP represents a more coordinated and inclusive model. Previous studies, such as those by Adebayo and Akinyemi (2019), found that while past programs aimed at reducing child marriage often lacked consistency and long-term funding, current initiatives like GCESP show promise due to their comprehensive design and government-backed implementation.

The results underscore the significant impact of advocacy and awareness campaigns in the ongoing efforts to eliminate child marriage in Kogi State. Since 2018, the state government, through its Ministry of Women Affairs and Social Development and the Child Rights and Child Protection Programme (CRCPP), has implemented multifaceted advocacy initiatives to curb early and forced marriages. The campaigns have employed both traditional and modern media platforms, including radio, television, and social media, complemented by community-level outreach. These strategies have proven effective in raising public consciousness about the dangers and illegality of child marriage, particularly among young girls, parents, and community leaders.

A compelling illustration of this impact is seen in the testimony of an 18-year-old female respondent from Okene Local Government Area, who noted her awareness of her rights to be protected from early or forced marriage. This response highlights a rising level of legal literacy among girls in the state, a critical factor in preventing child marriage. Moreover, the campaigns appear to have positively influenced community attitudes and behaviors, particularly regarding girls' education. There has been a noticeable increase in school enrollment and retention of girls, which aligns with earlier research findings that link educational access to lower incidences of child marriage (Walker 2012). By reinforcing the value of education and encouraging legal protections at the local government level, the initiatives have laid the groundwork for more systemic change.

Compared to previous findings, this recent data suggests a more pronounced shift in social attitudes. For instance, earlier studies in Kogi State reported limited community engagement and persistent cultural resistance to anti-child marriage policies (Adewuyi and Odu 2016). In contrast, the current findings indicate growing support at both household and community levels, suggesting that sustained advocacy is beginning to erode entrenched norms. However, the persistence of early marriage in rural areas illustrates the ongoing challenges. Traditional beliefs, patriarchal structures, and economic pressures continue to drive child marriage in less urbanized regions. These findings echo past research, such as that by Efevbera et al. (2017), which emphasizes the complex interplay between poverty, gender inequality, and tradition in sustaining early marriage practices.

The enactment of the Violence Against Persons Prohibition (VAPP) Law in 2022 and the establishment of a dedicated Gender-Based Violence (GBV) Directorate in 2024-mark critical milestones in institutional efforts to protect children, particularly girls, from early and forced marriages. These legal reforms demonstrate a shift from policy rhetoric to actionable mechanisms, including the creation of nine family courts and the prosecution of child abuse cases, which indicate an operational commitment to justice and child protection (Kogi State Ministry of Women Affairs and Social Development, 2025).

The partnership with civil society organizations such as ActionAid Nigeria and the Participation Initiative for Behavioural Change in Development (PIBCID) also reflects a collaborative approach that strengthens community-level capacity through training and advocacy. These efforts are crucial in enhancing legal literacy and equipping stakeholders to identify, report, and respond to incidents of child marriage and related abuses. When compared to previous findings, these developments represent a significant evolution. Earlier studies had consistently highlighted the

lack of legal enforcement and poor institutional coordination as key barriers to the elimination of child marriage in Kogi State and other parts of Northern Nigeria (Eze 2020, UNICEF 2021). For instance, prior to the VAPP Law, existing child protection frameworks lacked specificity and often failed to address the root causes of early marriage, such as poverty, gender inequality, and cultural norms. Moreover, the absence of specialized courts meant that GBV cases were often delayed or dismissed in the general judicial process (Adegboye and Olanrewaju 2019).

Despite the evident progress, current findings echo long-standing challenges, particularly the gap between policy and practice in rural communities. The uneven enforcement of laws, coupled with persistent traditional practices that endorse child marriage, continues to undermine the impact of legal reforms. Victims' reluctance to report abuses due to social stigma and fear of retribution further complicates enforcement, suggesting that legal measures alone are insufficient without sustained community engagement and attitudinal change.

The findings regarding the Ovia-Osese Festival in Ogori, Kogi State, reveal both the potential and the complexities of using cultural frameworks in the elimination of child marriage. The festival, which celebrates chastity and marks the initiation of virgins into womanhood, acts as a socio-cultural mechanism that discourages early marriage and promotes abstinence among young girls. By publicly recognizing and celebrating virginity and maturity before marriage, the community cultivates an environment where early sexual activity and by extension, early marriage is socially discouraged. The festival also serves as a preventive measure against teenage pregnancy, a key driver of child marriage in many Nigerian communities (Walker 2012). However, the limitations of the Ovia-Osese Festival must be acknowledged. The emphasis on virginity as a prerequisite for participation may perpetuate harmful gender norms and infringe upon the rights of girls. The societal pressure to conform to chastity standards may lead to stigma and shame for those who do not meet the criteria, whether due to personal choices or circumstances beyond their control, such as sexual abuse. This reinforces gender discrimination and may deter openness about sexual health, thereby undermining broader public health goals (Nnamuchi 2008).

Additionally, the festival's physical and time demands may conflict with formal education, particularly for school-aged girls. This could have unintended consequences on their academic progress and overall empowerment, both of which are essential tools in ending child marriage (UNESCO 2015).

Conclusion and Recommendations

The MNCHW has demonstrated substantial short-term success in expanding access to maternal and child health services in Kogi State, especially among hard-to-reach populations, its periodic nature, reliance on external partners, and challenges around sustainability and community engagement limit its long-term effectiveness. While the campaign was primarily health-focused, its implications for the elimination of child marriage in Kogi State are significant. It demonstrated how health interventions, when thoughtfully implemented, can serve as entry points for social change. The GCESP initiative demonstrates that government commitment,

when paired with community engagement and strategic partnerships, can yield tangible progress in addressing child marriage. These findings not only reflect a positive trend in Kogi State but also offer a replicable model for similar contexts across Nigeria and Sub-Saharan Africa. The intensified advocacy and awareness efforts in Kogi State have made significant strides in empowering communities and reducing the prevalence of child marriage, the findings also point to the need for sustained, context-specific interventions. The Ovia-Osese Festival illustrates how cultural institutions can be leveraged to combat child marriage in Kogi State, but it also highlights the importance of aligning tradition with modern human rights principles. While the Kogi State Government has made measurable strides in combating child marriage through legislative and institutional reform, these efforts must be reinforced with long-term investment in public education, rural outreach, and infrastructure development. Bridging the gap between urban legal institutions and rural social realities is essential for the full realization of girls' rights. As such, future interventions should prioritize community-based dialogue, the empowerment of traditional leaders, and the systematic monitoring of implementation outcomes.

Strengthening routine health services, building local capacity, securing sustainable funding, and fostering ongoing community dialogue are critical to building on the successes of the MNCHW and ensuring sustained improvements in maternal and child health outcomes. By empowering women, increasing access to female role models, promoting health education, and engaging local communities, the project contributes meaningfully to a broader, multi-sectoral effort to end child marriage and promote the rights and well-being of girls across the state. Continued investment in education, legal reform, and economic empowerment especially in rural communities remains essential for achieving the long-term eradication of child marriage in the state. To maximize impact of the Ovia-Osese Festival, it is crucial to integrate reproductive health education, ensure inclusivity, and protect girls from stigmatization or coercion. Future interventions should focus on reforming such cultural practices to make them more inclusive and rights-based, without eroding their communal and moral value.

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