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This collection of research highlights the core mission of Ennoia: to explore the interdisciplinary friction between societal dynamics, educational practices, and technological evolution. The articles in this issue converge on a singular, complex theme: the persistent gap between formal structures (policy, biology, or curriculum) and the lived human experience.

We begin in the realm of Educational Technology and Pedagogy, where research into Mathematics Teachers' Integration of Mathematical Modeling reveals a heartening readiness among educators. While teachers demonstrate high theoretical competence, the study poignantly identifies systemic and contextual barriers that hinder consistent implementation. This theme of structural resistance is echoed in our Global Synthesis on Gender Dynamics in Industrial Arts, which uncovers a global paradox. Despite robust institutional frameworks for parity, internalized gender schemas continue to drive occupational segregation, proving that policy alone cannot dismantle deeply rooted social scripts.

Transitioning from the classroom to the Biological and Social Self, this issue challenges long-held assumptions about adolescent development and public health. Our study on Chronotype and Student Subjective Wellbeing offers a surprising perspective: in the Philippine context, a student's internal biological clock may be less influential on their sense of purpose than the school environment itself. However, when we turn to HIV Education, we see a more sobering disconnect. While literacy regarding transmission is high among college students, instrumental stigma and sociological fear persist. It suggests that our current social technology—the way we transmit health information—is successful at teaching biology but remains insufficient in dismantling the sociology of fear.

Finally, we close with a forward-looking framework for Post-Pandemic Recovery. The Divine Attachment Model provides an integrative approach to family counseling, demonstrating how spiritual perceptions can be harnessed as a social technology for systemic resilience. By mapping the correlation between secure divine attachment and family cohesion, this research offers clinicians a localized, faith-integrated path toward healing in a fractured world.

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Mathematics Teachers' Level of Integration of Mathematical Modeling into Classroom Instruction

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Abstract

This study examined the level of integration of mathematical modeling in classroom instruction among secondary mathematics teachers in Kapatagan, Lanao del Norte. Anchored on the Technological Pedagogical Content Knowledge (TPCK) framework, the research assessed five domains: content knowledge, pedagogical knowledge, attitudes and beliefs, skills and competencies, and professional experience and exposure. A descriptive research design was employed, involving ten purposively selected teachers. Data were collected using a validated survey questionnaire with Likert-scale items and open-ended responses and analyzed using descriptive statistics and thematic analysis. Findings revealed a very high overall level of integration (M = 4.38), with content knowledge (M = 4.60) and attitudes and beliefs (M = 4.54) emerging as the strongest domains. Teachers demonstrated strong theoretical grounding and positive dispositions toward modeling-based instruction. However, comparatively lower scores in experience and exposure (M = 4.10) suggest a need for more sustained professional engagement. Thematic analysis identified key challenges, including instructional time constraints, learner-related difficulties in transitioning to open-ended problem-solving, and limited access to localized resources and technological tools. The study concludes that while teachers possess high readiness to integrate mathematical modeling, systemic and contextual barriers hinder its consistent implementation. It recommends enhanced professional development, curriculum flexibility, and resource provision to support effective practice. Despite its limited sample size and reliance on self-reported data, the study provides valuable localized insights to inform instructional improvement and policy support for modeling integration in mathematics education.

Keywords: Mathematical Modeling, TPCK Framework, Mathematics Teacher, Classroom Instruction, Modeling Integration

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1. Introduction

The integration of mathematical modeling into curricula has seen rapid global growth, primarily driven by new international standards aimed at making mathematics more relevant to contemporary society (Asempapa & Brooks, 2020). Beyond mere calculation, modeling is now recognized as a vital component of STEM education, showing a direct positive impact on students' mathematical skills and academic performance (Armutcu & Bal, 2023; Mallo & Cajandig, 2025). This landscape is characterized by great promise, offering unique opportunities for student engagement and deep mathematical thinking, yet it remains a complex endeavor that requires moving beyond the simple documentation of barriers toward actively building instructional capacity (Taite & DiNapoli, 2025).

1.1 Teacher Beliefs and Attitudes

The successful implementation of modeling-based instruction is largely predicated on the internal orientations of the educator. Research indicates that a teacher's attitude, specifically regarding constructivism, personal understanding, and perceived relevance, serves as a primary determinant of classroom practice (Asempapa & Brooks, 2020). Furthermore, the specific belief structures of teachers play a critical role; those with non-traditional or constructivist beliefs tend to demonstrate significantly higher modeling competencies than those holding traditional views (Kaya & Dede, 2025). When teachers maintain a positive attitude toward problem-solving and align their goals with national curricula, they are more likely to successfully transfer these skills to their students (Mršnik et al., 2023).

1.2. Cognitive Drivers and Metacognitive Regulation

Cognitive factors, particularly metacognition, act as powerful predictors of a student’s success in modeling tasks. Metacognitive awareness, the ability to plan, monitor, and evaluate one's thinking, has been shown to significantly influence modeling competency (Hidayat et al., 2020; Oficiar et al., 2024). Students who are mindful of their declarative and procedural knowledge are better at recalling concepts and evaluating problem-solving strategies (Tabuyo, 2024). These cognitive processes also foster critical thinking skills, particularly in the area of interpretation, which is essential for translating real-world data into mathematical structures (Amalia et al., 2019).

1.3. Technological Integration

Technology offers dual roles in modeling: it acts as (1) a facilitator of learning and (2) a potential barrier to deep understanding. While ICT-integrated pedagogies and Collaborative Virtual Environments (CVEs) can enhance teaching proficiency, their effectiveness is often hampered by resistance to change, lack of training, and the sudden shifts necessitated by the COVID-19 pandemic (Olawale, 2023; Samantray et al., 2024). Interestingly, a teacher's willingness to use these tools is often linked to their underlying beliefs about technology's role in discovery learning (Vorhölter & Greefrath, 2025). However, educators must be cautious of "technological over-reliance," where students use digital tools without critically evaluating the validity of the outputs (Kandemir & Eryilmaz, 2025).

1.4. Pedagogical Frameworks and Instructional Scaffolding

Transitioning from theory to practice requires specific pedagogical models that emphasize democratized classroom environments and equal student opportunity (Casey & Bjørke, 2024). Effective instruction often involves Differentiated Instruction (DI) to cater to diverse learner needs, making the math experience more meaningful by connecting prior knowledge to real-life applications (Insorio & Librada, 2025). To ensure success, educators must employ deliberate scaffolding, allowing for sufficient practice and feedback within small-group settings where students can cooperatively communicate their modeling processes (Wilson et al., 2020).

1.5. Navigating Instructional Challenges and Common Pitfalls

Despite the inherent benefits of this approach, both teachers and students face significant hurdles throughout the modeling cycle. Students frequently encounter specific cognitive hurdles during the construction phase: identifiable patterns of error that include misunderstandings of essential facts, misconnections between key variables, and logical lapses in procedural application (Shodikin et al., 2024). These difficulties are not limited to students; even preservice teachers, while capable of simplifying complex problems, often struggle with the critical verification and interpretation stages of the modeling process (Kandemir & Eryilmaz, 2025). Furthermore, the overall effectiveness of modeling activities is highly sensitive to the nature of the task, the age of the learners, and the specific socio-critical context such as when modeling is used to address complex societal issues like environmental sustainability (Steffensen & Kasari, 2023; Tasarib et al., 2025).

1.6. Context and Significance of this Study

This study examined the integration of mathematical modeling among ten secondary teachers in Kapatagan, Lanao del Norte. This evaluated five critical dimensions: content knowledge, pedagogical strategies, attitudes, skills, and professional exposure. While modeling effectively bridges abstract concepts with real-world applications, its implementation remains inconsistent due to systemic barriers like time and resource constraints. By assessing local teacher readiness, this research addresses the urgent need to move beyond documenting obstacles toward actively building instructional capacity for meaningful pedagogical change. Ultimately, the findings provide a localized evidence base to inform targeted professional development and strengthen institutional support systems.

2. Methodology

This study utilized a descriptive research design to systematically examine the extent to which secondary mathematics teachers integrate mathematical modeling into their daily instruction. This approach allowed for a detailed assessment of teacher readiness and the identification of specific pedagogical barriers without manipulating the natural classroom environment

2.1. Participants and Sampling

The study involved ten secondary mathematics teachers currently serving at a public secondary school in Kapatagan, Lanao del Norte. Participants were selected through purposive sampling to ensure that the respondents possessed the necessary classroom experience and active teaching status required to provide informed insights into modeling integration.

2.2. Instrument and Data Collection

Data were gathered using a validated survey questionnaire specifically designed to measure integration across five core domains: content knowledge, pedagogical knowledge, attitudes and beliefs, skills and competencies, and professional experience and exposure. To complement the quantitative data, the instrument included open-ended questions aimed at identifying the practical challenges teachers encounter when implementing modeling-based instruction.

The study utilized a survey questionnaire adapted from the Technological Pedagogical Content Knowledge (TPCK) framework (Hosseini & Kamal, 2012). This framework evaluates the intersection of technology, pedagogy, and content knowledge to measure effective instruction. The instrument was contextualized into five domains:

- *Content Knowledge*: Mastery of mathematical modeling concepts and theories.
- *Pedagogical Knowledge*: Understanding of instructional methods and modeling-based practices.
- *Attitudes and Beliefs*: The perceived value and internal predispositions toward modeling.
- *Skills and Competencies*: Practical ability to design and execute modeling tasks.
- *Experience and Exposure*: Professional development and prior classroom application.

Responses were measured on a 5-point Likert scale. To ensure local relevance and academic rigor, the instrument underwent validation by a panel of experts in mathematics education and educational technology before administration.

2.3. Ethical Considerations

Ethical integrity was maintained throughout the research process. Participation was entirely voluntary, and all respondents were fully informed of the study's objectives before providing consent. To protect the professional standing of the participants, strict confidentiality was maintained, and data were used exclusively for academic purposes.

2.4. Data Analysis

The quantitative data were processed using descriptive statistics, specifically utilizing mean scores and standard deviations to determine the level of integration within each of the five domains. For the qualitative data derived from the open-ended

responses, thematic analysis was employed to categorize and interpret the recurring challenges and systemic barriers reported by the educators.

3. Results and Discussion

The findings of this study provide a comprehensive overview of how secondary mathematics teachers in Kapatagan, Lanao del Norte, integrate mathematical modeling into their instructional practices. The data are categorized into five domains of teacher readiness and a thematic summary of implementation challenges.

3.1. Level of Integration of Mathematical Modeling

As shown in Table 1, the overall level of integration among the participants is "Very High" (M = 4.38, SD = 0.42). Teachers demonstrated the highest proficiency in Content Knowledge (M = 4.60), suggesting a robust theoretical understanding of modeling concepts. Attitudes and Beliefs also scored significantly high (M = 4.54), indicating that educators value modeling as a critical pedagogical tool. While Skills and Competencies (M = 4.22) and Experience and Exposure (M = 4.10) are still within the "Very High" range, they represent the areas with the most room for growth.

Table 1. *Level of Integration of Mathematical Modeling*

Domains	Mean	SD	Interpretation
Content Knowledge	4.60	0.35	Very High
Pedagogical Knowledge	4.45	0.40	Very High
Attitudes and Beliefs	4.54	0.38	Very High
Skills and Competencies	4.22	0.48	Very High
Experience and Exposure	4.10	0.51	Very High
Overall Mean	**4.38**	**0.42**	**Very High**

Note: n = 10

Scale:

4.21 – 5.00 = Very High (The domain is integrated consistently and extensively)
3.41 – 4.20 = High (The domain is integrated frequently)
2.61 – 3.40 = Moderate (The domain is integrated occasionally)
1.81 – 2.60 = Low (The domain is rarely integrated)
1.00 – 1.80 = Very Low (The domain is not integrated)

The data observed in this study suggests that the participants are well-positioned to meet the demands of modern mathematics curricula. The high overall mean reflects a global shift toward instructional strategies that bridge the gap between abstract theory and real-world application (Asempapa & Brooks, 2020).

The emergence of Content Knowledge (M = 4.60) as the strongest domain is a critical finding. According to the TPCK framework, a deep understanding of the subject matter to be learned or taught is the essential foundation upon which all other instructional decisions are built (Hosseini & Kamal, 2012). This robust theoretical grasp is vital because modeling tasks are inherently non-linear and unpredictable; teachers must possess a high level of mathematical flexibility to guide students through the transition from real-world word problems to mathematical structures (Shodikin et al., 2024). This finding mirrors recent research by Kaya and Dede (2025), which posits that a strong

cognitive foundation in modeling allows teachers to move beyond traditional, procedure-heavy instruction.

The high scores in Attitudes and Beliefs (M = 4.54) suggest that these teachers do not merely understand modeling but actively value it. This internal predisposition is a significant predictor of classroom behavior. Teachers with positive attitudes toward problem-solving are more likely to create meaningful learning experiences that cater to student diversity (Insorio & Librada, 2025; Mršnik et al., 2023). Furthermore, this positive outlook is essential for fostering democratic classrooms where students of all abilities are encouraged to engage with complex societal issues through a mathematical lens (Casey & Bjørke, 2024).

Conversely, while Experience and Exposure (M = 4.10) achieved a "Very High" interpretation, it remained the lowest-scoring domain. This subtle disparity suggests that while teachers are theoretically prepared and professionally willing, they may lack sustained professional learning and practical tools (Taite & DiNapoli, 2025). This finding is consistent with Olawale (2023), who noted that external disruptions such as the rapid shift to digital and hybrid models have often outpaced the professional development available to teachers. Even with high internal competence, a lack of hands-on experience in verification and interpretation stages can lead to missed opportunities for deep student learning (Kandemir & Eryilmaz, 2025).

3.2. Challenges Encountered in Implementation

The thematic analysis of open-ended responses revealed three primary challenges that hinder consistent integration:

- *Instructional Time Constraints*: Teachers reported that the intensive nature of the modeling cycle often conflicts with the rigid pacing of the standard curriculum.
- *Learner-Related Difficulties*: Educators noted that students often struggle with the transition from traditional computation to open-ended modeling, particularly when translating word problems into mathematical structures.
- *Resource Limitations*: A lack of localized modeling materials and limited access to specific technological tools remains a persistent hurdle.

Although the respondents demonstrated a high level of preparedness, the thematic analysis of their open-ended responses brought to light several significant hurdles that continue to impede the consistent integration of mathematical modeling in the classroom.

A primary concern centered on instructional time constraints, as teachers observed that the intensive, multi-stage nature of the modeling cycle, stretching from the initial posing of real-world problems to final verification, frequently clashes with the rigid pacing requirements of the standard curriculum (Taite & DiNapoli, 2025; Tasarib et al., 2025).

This temporal pressure is further compounded by learner-related difficulties; specifically, educators noted that students often struggle to transition from familiar, traditional computation to the more fluid demands of open-ended modeling. This is particularly evident when students attempt to translate complex word problems into

formal mathematical structures, a challenge widely recognized in recent literature (Shodikin et al., 2024).

Finally, these pedagogical obstacles are exacerbated by persistent resource limitations. The lack of localized modeling materials, coupled with restricted access to specific technological tools, creates a hurdle that mirrors the broader technological limits identified by contemporary researchers (Olawale, 2023). Together, these factors suggest that even highly ready teachers require more flexible scheduling and improved resource support, as supported by a study on the implementation of the new Matatag Curriculum (Malinao & Miano, 2025), to fully realize the potential of modeling-based instruction.

4. Conclusion and Recommendation

This study establishes that secondary mathematics teachers in Kapatagan, Lanao del Norte demonstrate a very high level of integration of mathematical modeling across all measured domains, particularly in content knowledge, pedagogical understanding, and positive instructional dispositions. These findings indicate that teachers are not only theoretically grounded but also pedagogically inclined toward modeling as a meaningful approach to mathematics instruction. However, the relatively lower mean in experience and exposure, alongside the identified challenges in instructional time, learner readiness, and resource availability, reveals a critical gap between teacher readiness and sustained, context-sensitive implementation.

The results affirm that while internal competencies (knowledge, beliefs, and skills) are well-established, external and systemic constraints continue to limit the full operationalization of modeling-based instruction. This suggests that advancing mathematical modeling in classrooms requires a shift from individual teacher capacity-building toward institutional and structural support mechanisms.

Despite its contributions, this study is subject to several limitations. The small sample size (n = 10) and the use of purposive sampling within a single school context limit the generalizability of the findings. The reliance on self-reported survey data may also introduce response bias, potentially inflating perceived levels of integration. Additionally, the study employed a descriptive design, which restricts causal inferences and does not capture longitudinal changes in instructional practices. The absence of classroom observations or student performance data further constrains the validation of reported practices against actual instructional outcomes.

In light of these findings and limitations, the following recommendations are advanced:

- *Structured Professional Development*: Schools and educational authorities may implement sustained, practice-oriented training programs focusing on advanced stages of modeling, particularly in validation and interpretation processes.
- *Curriculum and Time Flexibility*: Policymakers may consider revisiting curriculum pacing guides to allow sufficient time for the full modeling cycle, ensuring depth over coverage.
- *Development of Localized Instructional Materials*: Teachers and curriculum developers may design contextually relevant modeling tasks and resources that align with learners' socio-cultural realities.

- *Technology Integration Support*: Schools and education enablers may focus on investments for accessible and pedagogically aligned technological tools accompanied by targeted teacher training to prevent superficial or over-reliant usage.
- *Future Research Expansion*: Subsequent studies should employ larger and more diverse samples, integrate mixed-methods approaches (including classroom observations), and examine the impact of modeling integration on student learning outcomes to provide a more comprehensive evidence base.

Overall, the study underscores that achieving meaningful integration of mathematical modeling is not solely a function of teacher capability but a product of coherent alignment among pedagogy, policy, and practice.

Conflict of Interest

The authors declare that there is no known conflict of interest regarding the publication of this study. All aspects of the research, including design, data collection, analysis, and interpretation, were conducted independently, without any financial, institutional, or personal relationships that could have influenced the outcomes.

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Gender Dynamics in Industrial Arts Education: A Global Synthesis and Philippine Case Analysis

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Abstract

Despite narrowing educational gender gaps globally, Industrial Arts and Technical and Vocational Education and Training (TVET) remain stubbornly male-dominated. This integrative review investigates this persistent disparity by synthesizing global macro-data across five regions alongside a targeted micro-analysis of the Philippine educational system. Findings reveal a profound global paradox: while mechanisms of exclusion vary, from economic constraints in Sub-Saharan Africa to cultural barriers in the Gulf States and internalized tracking in Europe, the marginalization of women in technical fields is universally consistent. The Philippines serves as a critical microcosm. Despite robust institutional parity frameworks and high female certification rates, deep occupational segregation persists. Internalized gender schemas strongly drive self-selection into stereotyped pathways, effectively overriding formal access policies.

Keywords: Gender Dynamics, Industrial Arts, Education, Philippine Basic Education, TVET

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1. Introduction

Industrial Arts education variously termed Technology Education or Design & Technology has historically been heavily gendered as a male domain across virtually every region globally. In the United States, mid-20th-century shop programs were explicitly male spaces, viewed as a "man's world" with minimal effort toward female inclusion (Haynie, 1999). Despite rebranding efforts in the 1960s and 1970s to broaden its appeal, progress has been stagnant; by the early 2000s, female enrollment in high school technology courses remained below 15%, and only 7% of technology teachers were female (Gloeckner, 1997; Haynie, 1999). Zuga (1999) noted a concerning paradox: women and girls perceive technology education as a male domain, a perception that often strengthens after taking a course.

This gendering operates through multiple reinforcing channels: early socialization coding technical work as masculine, a predominantly male teaching workforce, male-centric curricula, and labor market discrimination (McCarthy, 2009). While the general education gender gap has narrowed or reversed globally, particularly in Latin America, East Asia, and OECD countries, the within-field gap in technical and vocational education persists. This review aims to map these global enrollment landscapes and contextualize these dynamics through an in-depth analysis of the Philippine industrial education genderization.

2. Method

This study utilizes an integrative literature review design to synthesize secondary data, international comparative studies, and regional reports regarding gender disparities in Technical and Vocational Education and Training (TVET) and Industrial Arts.

The data sources encompass global academic literature, cross-country datasets (UNESCO, OECD, ILO), and localized empirical studies spanning from 1996 to 2025. The analysis is divided into two phases:

- *Global Macro-Analysis*: Examining comparative enrollment pictures across Sub-Saharan Africa, the Gulf States (GCC), Europe, Latin America, and Asia to identify region-specific barriers.
- *Philippine Micro-Analysis*: A targeted examination of the Philippine K-12 Senior High School (SHS) TVL track and post-secondary TVET landscape, evaluating the efficacy of formal gender equality frameworks against persistent cultural schemas.

3. Results

3.1. Global and Regional Enrollment Landscapes

The comparative enrollment picture reveals that while women remain underrepresented in technical tracks globally, the specific mechanisms of exclusion vary significantly by region.

The data presented in Table 1 illustrates a profound global paradox within Technical and Vocational Education and Training (TVET): while women's overall educational attainment has risen dramatically worldwide, their participation in technical and

industrial fields remains systematically suppressed across vastly different cultural and economic contexts.

Table 1. *Global and Regional Enrollment Landscapes*

Region	Enrollment Characteristics & Key Barriers	Notable Findings
Sub-Saharan Africa	Largest and most persistent gender gaps. Barriers include public stigma, cost of materials, and lack of role models.	Ghana shows a 51.6% gap (Adams & Baddianaah, 2023); Nigeria reports systemic stereotyping and harassment, though some localized parity is emerging (Obafemi & Funmilayo, 2021).
Gulf States	High overall female higher education enrollment, but drastically low TVET participation.	A double barrier exists: cultural norms restricting female labor force participation intersect with the low social prestige of vocational tracks (Khan et al., 2017).
Europe / OECD	High vocational school shares, but heavily tracked by gender. Women dominate health/welfare; men dominate STEM/technical.	Germany achieved 100% female completion in surveyed TVET programs due to robust policies, whereas UK girls outperform boys in Design & Technology but still opt out of "core" strands (Spendlove, 2000; Tobias et al., 2024).
Latin America	Secondary education gender gaps have closed, and female tertiary enrollment is high.	STEM programs suffer from low female enrollment and high dropout rates once disaggregated by field (García-Holgado et al., 2020).
Asia	Highly heterogeneous. Developed nations generally show less inequality in vocational education than developing nations (Parashar, 2024).	Kerala, India presents a counter-trend with higher female engineering enrollment due to specific socio-political preconditions (Johnson et al., 2004).

Beginning with Sub-Saharan Africa, the disparities are arguably the most acute and structurally entrenched. The barriers keeping women out of technical fields here are heavily socio-economic, driven by the prohibitive cost of materials, a stark absence of female role models, and a pervasive public stigma against vocational education for women (Adams & Baddianaah, 2023). This is starkly quantified in regions like Ghana, which reports a massive 51.6% gender gap (Adams & Baddianaah, 2023), and Nigeria, where systemic stereotyping and harassment persist (Akor et al., 2015), even as isolated pockets of emerging parity begin to surface in specific locales (Obafemi & Funmilayo, 2021).

Moving from the structural challenges of Africa to the Middle East, the Gulf States (GCC) present a fascinating "double barrier" that shifts the focus from economic scarcity to cultural paradox (Khan et al., 2017). Women in the GCC achieve high rates of general higher education enrollment, yet their participation in TVET is dismally low. This

phenomenon is driven by the intersection of conservative cultural norms that restrict female labor force participation and the generally low social prestige associated with vocational pathways, effectively neutralizing the formal economic diversification agendas of these nations (Khan et al., 2017).

Contrasting the developing world with the Global North, Europe and the broader OECD countries reveal that high vocational infrastructure does not naturally equate to gender equity. While Europe boasts high overall vocational participation (van der Meulen Rodgers & Boyer, 2006), its educational tracking is deeply segregated by gender. Women are overwhelmingly funneled into health and welfare programs, leaving STEM and technical fields heavily male-dominated (OECD, 2020). However, the data also highlights the power of targeted policy: Germany's robust, gender-sensitive frameworks have yielded exceptional female completion rates in surveyed programs (Tobias et al., 2024). Conversely, the UK presents a frustrating cognitive dissonance where girls academically outperform boys in Design & Technology but still actively opt out of the core industrial strands, suggesting that cultural coding overrides academic capability (Growney, 1996; Spendlove, 2000).

Latin America shares this deceptive surface-level equity. In this region, the general secondary education gender gap has effectively closed, and female tertiary enrollment is remarkably high (García-Holgado et al., 2020). Yet, the illusion of parity shatters when the data is disaggregated by field of study; STEM and industrial programs continue to suffer from chronically low female enrollment and disproportionately high dropout rates, proving that formal access does not dismantle entrenched gender schemas (García-Holgado et al., 2020).

Finally, the immense heterogeneity of Asia underscores how hyper-local socio-political climates can disrupt global trends. While a broad pattern suggests that developed Asian nations experience less gender inequality in vocational education compared to their developing counterparts (Parashar, 2024), specific regions defy these expectations. Kerala, India, serves as a prime counter-narrative, demonstrating unusually high female enrollment in engineering. This anomaly is attributed not to national wealth, but to unique local socio-political and cultural preconditions that have successfully decoupled technical work from sheer masculinity (Johnson et al., 2004).

Ultimately, the synthesis of this global data reveals that exclusion in Industrial Arts and TVET is a shape-shifting phenomenon. Whether it manifests through harsh economic constraints in Sub-Saharan Africa, cultural paradoxes in the Gulf States, or internalized tracking in Europe and Latin America, the outcome is remarkably and stubbornly consistent: the persistent marginalization of women in technical fields.

3.2. Industrial Arts Education in the Philippines

The Philippines presents a distinctive model characterized by strong formal gender equality frameworks such as the TESDA Women's Center and integrated Gender and Development (GAD) focal persons, yet entrenched gendered patterns persist.

National data from 2024 suggests general gender parity in TVET participation, with women outperforming men in certification rates in regions like the National Capital Region (Flores et al., 2025). However, this surface-level parity masks deep segregation in course selection.

Female TVET graduates experience a 52% employment gain post-training, yet they heavily cluster in stereotypical service roles due to prevailing traditional norms and household duties (Talento et al., 2022). Dumadag et al. (2024) identify internal gender schema, the mental frameworks regarding male vs. female work, as the primary driver of issues, overriding formal access or labor market discrimination.

In the Philippine basic education system, Grade 7 exploratory courses show balanced participation (Brosas, 2022). However, by Senior High School, the TVL track splits into heavily gendered pathways: (a) Industrial Arts (IA): Strands like Shielded Metal Arc Welding (SMAW), Electrical Installation, and Automotive Servicing are male-dominated. (b) Home Economics (HE): Strands like Cookery, Beauty Care, and Dressmaking skew heavily female. Even when males enroll in feminized strands like Cookery, it is often driven by entrepreneurial ambition rather than shifting gender expectations (Soliman & Gabutin, 2025). (c) Peer Influence: Arango & Labo (2020) found that advice from same-sex friends and the perceived "availability of strands for men" strongly dictate student choices before they even enter the classroom.

4. Discussion

The findings indicate that while policy interventions and formal access are necessary, they are insufficient to dismantle the gender dynamics in Industrial Arts and technical education. The persistence of the within-field gender gap across varied economic and cultural contexts highlights the insidious nature of early socialization.

A critical insight from the Philippine case is the limitation of viewing TVET purely as an employment pipeline. Despite women outperforming men in certification (Flores et al., 2025) and institutional efforts to embed gender sensitivity (Gutierrez, 2010), students' career aspirations remain constrained by their internalized gender schemas (Dumadag et al., 2024; Virtudazo, 2024). The UK data mirrors this: girls can achieve higher examination scores than boys in technical subjects but will still disengage from the field (Growney, 1996; Spendlove, 2000).

If gender schema and peer networks drive self-selection, interventions must occur earlier and more experientially. Programs like the UK's e-textiles model (Coulter, 2023), which blends multidisciplinary arts with technical physics to bypass traditional gender coding, offer a promising blueprint. Furthermore, as Bermudez (2025) argues, technical education must evolve from mere skills training into an empowering incubator that includes leadership capacity building, addressing the socio-cultural realities and household burdens that women face post-graduation.

Ultimately, achieving genuine equity in Industrial Arts requires dismantling the underlying assumption of what constitutes gender-appropriate labor, redesigning both the physical environments of industrial training and the cultural narratives surrounding them.

5. Conclusion

The synthesis of global literature and Philippine-specific data reveals a profound and persistent paradox in Industrial Arts and Technical and Vocational Education and Training (TVET). While formal institutional barriers to female participation have largely been dismantled and general educational gender gaps have closed or reversed globally,

deeply entrenched gender schemas continue to drive self-selection, occupational segregation, and post-training outcomes. The global evidence demonstrates that whether the barriers manifest as economic constraints in Sub-Saharan Africa, cultural paradoxes in the Gulf States, or internalized tracking in Europe and Latin America, the marginalization of women in technical fields remains a stubborn reality.

The Philippine context serves as a critical microcosm of this phenomenon. Despite robust, institutionalized gender parity frameworks, high female certification rates, and surface-level parity in exploratory basic education, students are still heavily channeled into stereotypically gendered pathways by the time they reach Senior High School and post-secondary TVET. Ultimately, achieving genuine equity in technical education requires acknowledging that formal access and policy mandates are insufficient; the root of the disparity lies in the cognitive frameworks and socialized perceptions of what constitutes appropriate labor for men and women.

The findings of this integrative review carry several critical implications for social education. Because gendered perceptions solidify early, interventions at the Senior High School or post-secondary level are often too late. Educational systems must integrate experiential, cross-disciplinary interventions such as the e-textiles model blending art, computing, and physics into primary and early secondary education. This approach can bypass traditional gender coding and foster technical confidence before self-selection occurs. Policies must evolve from simply ensuring equal enrollment to actively dismantling the gendered reputations of specific instructional strands and technical curricula must be augmented with dedicated leadership capacity-building and entrepreneurial empowerment modules.

Conflict of Interest

The author declares no known conflict of interest.

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Biological Clock and Academic Affect: Assessing the Impact of Chronotype on Student Subjective Wellbeing

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Abstract

Adolescence involves a biological shift toward eveningness, often causing misalignment with early school schedules. This study explored the relationship between chronotype and student subjective wellbeing. Using a quantitative descriptive-correlational design, data were gathered from 267 Grade 11 and 12 students in Misamis Occidental, Philippines. Chronotypes were identified using the MEQ-REV-SA, while the SSWQ measured student subjective wellbeing and its four dimensions. Results showed that most learners (53.6%) possessed an intermediate chronotype, reflecting a balanced biological preference. Furthermore, students reported high levels of subjective wellbeing, particularly regarding educational purpose. Pearson's correlation revealed no statistically significant relationship between chronotype and any wellbeing dimension. These findings suggest that chronological predisposition does not meaningfully correlate with the learner's sense of purpose, efficacy, or connectedness in the schooling context. The prevalence of the intermediate chronotype may act as a buffer against social jetlag, allowing students to adapt effectively to traditional school timings. Consequently, school-based factors may influence adolescent wellbeing more profoundly than innate chronobiological rhythms.

Keywords: Chronotype, Student Subjective Wellbeing, Senior High School, Chronobiology, MEQ, SSWQ

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1. Introduction

Adolescence is a critical developmental period marked by major biological and psychological transitions, including changes in sleep preferences and daily activity timing known as chronotypes. Chronotype, which is shaped by a combination of individual, environmental, and social factors, reflects an individual's innate biological preference for the timing of sleep and activity, regulated by the circadian rhythm (Chauhan et al., 2023; Karan et al., 2021). This 24-hour internal clock governs essential physiological processes and determines an individual's peak alertness and activity levels throughout the day (Shimura, 2020; Sultana, 2024). Individuals are generally classified as morning, evening, or intermediate types based on these innate schedules.

Research indicates that during adolescence, there is a prominent developmental shift toward eveningness, typically peaking between the ages of 14 and 19 (Rodríguez Ferrante & Leone, 2024; Verma et al., 2021). This biological delay often clashes with the early start times of traditional school systems, leading to social jetlag – a misalignment between an adolescent's internal biological clock and the external demands of their social and academic schedule (Bouman & Rutters, 2022; Caliandro et al., 2021). This misalignment has been linked to inadequate nutrient intake, increased sedentary behavior, and higher levels of depressive and anxiety symptoms (Saxvig et al., 2021; Tamura et al., 2021). Furthermore, while morning-type learners often exhibit superior academic performance, those with an evening chronotype frequently face challenges such as daytime sleepiness, reduced sleep duration, and higher rates of grade retention (Rodríguez Ferrante et al., 2023; Morrison et al., 2020).

Despite the well-documented deficits associated with later chronotypes, there is a growing imperative to move beyond a deficit-based model and toward a positive psychology perspective (Seligman & Csikszentmihalyi, 2000; Renshaw et al., 2015). This approach emphasizes cultivating strengths and conditions that enable students to thrive rather than solely addressing psychological distress. At the center of this perspective is

Student Subjective Wellbeing (SSW), defined as a learner's self-perceived quality of life within the school context, encompassing both emotional and cognitive evaluations of their educational experiences (Renshaw, 2016). According to the framework established by Renshaw et al. (2015), SSW is a multidimensional construct comprising four key pillars: joy of learning, school connectedness, educational purpose, and academic efficacy.

Although extensive research has examined the links between chronotype and clinical psychopathology or raw academic scores, there remains a significant gap in understanding how biological preferences correlate with these specific dimensions of school-based wellbeing (Poon et al., 2024). Understanding whether a student's natural chronotype influences their sense of purpose, belonging, or confidence in an academic environment is crucial for creating supportive educational systems that align with adolescents' biological needs (Digdon & Howell, 2008).

The present study seeks to address this gap by examining the relationship between chronotypes and subjective wellbeing among senior high school learners in a public secondary school setting. By utilizing the Morningness-Eveningness Questionnaire, Revised Self-Assessment Version (MEQ-REV-SA) (Terman et al., 2001) to identify individual chronotypes and the Student Subjective Wellbeing Questionnaire (SSWQ) (Renshaw, 2018) to measure school-based wellbeing, this research aims to establish how chronological predispositions correlate with students' overall emotional and academic health. The findings are expected to provide evidence-based insights to inform school policies, optimize learning schedules, and enhance the delivery of personalized psychosocial support and guidance services, ultimately fostering holistic adolescent development.

2. Method

2.1. Research Design

This study employed a quantitative, descriptive-correlational design to investigate the relationship between chronotype and subjective wellbeing among senior high school learners. This approach was selected to determine the degree of association between variables without experimental manipulation, allowing for a precise statistical analysis of how natural biological predispositions relate to student psychological outcomes.

2.2. Research Environment and Participants

The study was conducted in a public secondary trade school located in urban Misamis Occidental, Philippines, which follows a standard Department of Education schedule of 7:30 a.m. to 4:30 p.m. The participants consisted of 267 senior high school (SHS) learners (136 from Grade 11 and 131 from Grade 12) enrolled during School Year 2025–2026. A stratified sampling technique was utilized to ensure proportional representation based on grade level and sex, minimizing selection bias and enhancing the generalizability of the findings within the local context.

2.3. Research Instruments

To ensure a comprehensive evaluation, two validated self-report instruments were utilized:

- *Morningness-Eveningness Questionnaire, Revised Self-Assessment Version (MEQ-REV-SA)* (Renshaw, 2018): This 19-item tool was used to identify individual

chronotypes based on preferred timing for sleep and daily activities. Scores range from 16 to 86, categorizing learners into five types: definite evening (16–30), moderate evening (31–41), intermediate (42–58), moderate morning (59–69), and definite morning (70–86). The MEQ-REV-SA maintains the robust psychometric properties of the original instrument while offering improved clarity for adolescent populations.

- *Student Subjective Wellbeing Questionnaire (SSWQ)* (Terman et al., 2001): This measure assesses school-based wellbeing across four key dimensions: joy of learning, school connectedness, educational purpose, and academic efficacy. The SSWQ has demonstrated high internal consistency (overall α = .88) and stability over time (Renshaw & Arslan, 2016), making it a reliable tool for measuring a learner's self-perceived quality of life in an academic setting.

2.4. Data Gathering Procedure

Ethical clearance was obtained from the Saint Columban College Research Ethics Committee, and formal permissions were secured from the school administration and instrument developers. Before data collection, participants and their guardians (for those under 18) provided informed consent and/or assent. The instruments were administered in-person using a paper-based modality. To ensure comprehension, the researcher read each item aloud and provided oral translations into the vernacular. Responses were verified for completeness before being encoded and stored securely.

2.5. Data Analysis

The gathered data were analyzed using JASP and Microsoft Excel. Descriptive statistics, including count, mean, and standard deviation, were used to summarize chronotype distributions and levels of subjective wellbeing. To examine the relationship between chronotype (MEQ scores) and the dimensions of student subjective wellbeing (SSWQ scores), Pearson's correlation coefficient (r) was calculated. The null hypothesis was tested at a 0.05 level of significance.

2.6. Ethical Considerations

The study strictly adhered to the APA (2016) Ethical Principles of Psychologists and Code of Conduct and the Data Privacy Act of 2012 (RA 10173). Key protocols included ensuring confidentiality and anonymity, maintaining voluntary participation with the right to withdraw at any time, and guaranteeing the fair treatment of all participants regardless of their chronotype or academic track.

3. Results

3.1. Distribution of Chronotypes

Descriptive analysis of the Morningness-Eveningness Questionnaire (MEQ-REV-SA) scores indicated that the senior high school learners predominantly exhibited an intermediate chronotype. The mean MEQ score for the sample was 53.891 (SD = 9.848), which falls within the established intermediate range of 42 to 58. See Table 1 on the next page.

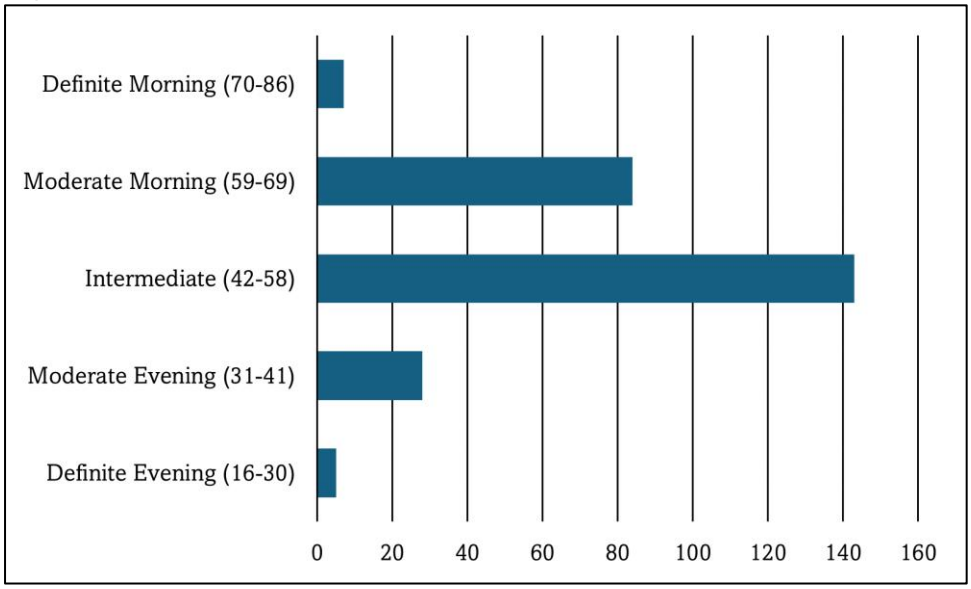
Table 1. *Learners' Chronotype*

Responses	Mean	*SD*	Chronotype Range	Interpretation
267	53.891	9.848	42 – 58	Intermediate Chronotype

Note: Chronotype range 16 – 30 = Definite Evening; 31 – 41 = Moderate Evening; 42 – 58 = Intermediate; 59 – 69 = Moderate Morning; 70 – 86 = Definite Morning

Of the 267 participants, 143 individuals (53.6%) were classified as intermediate types, suggesting a balanced biological preference that is neither distinctly morning- nor evening-oriented. This suggests that most students involved in the study do not have extreme sleeping or waking tendencies. See Figure 1.

Figure 1. *Distribution of Learners' Chronotype*



3.2. Levels of Student Subjective Wellbeing

The results from the Student Subjective Wellbeing Questionnaire (SSWQ) revealed that the learners maintained a moderate to high level of school-based wellbeing. The overall mean score for Student Subjective Wellbeing (SSW) was 44.640 (*SD* = 7.095), falling within the "Often" range (40–55), which indicates that students frequently experience positive psychological states at school. See Table 2.

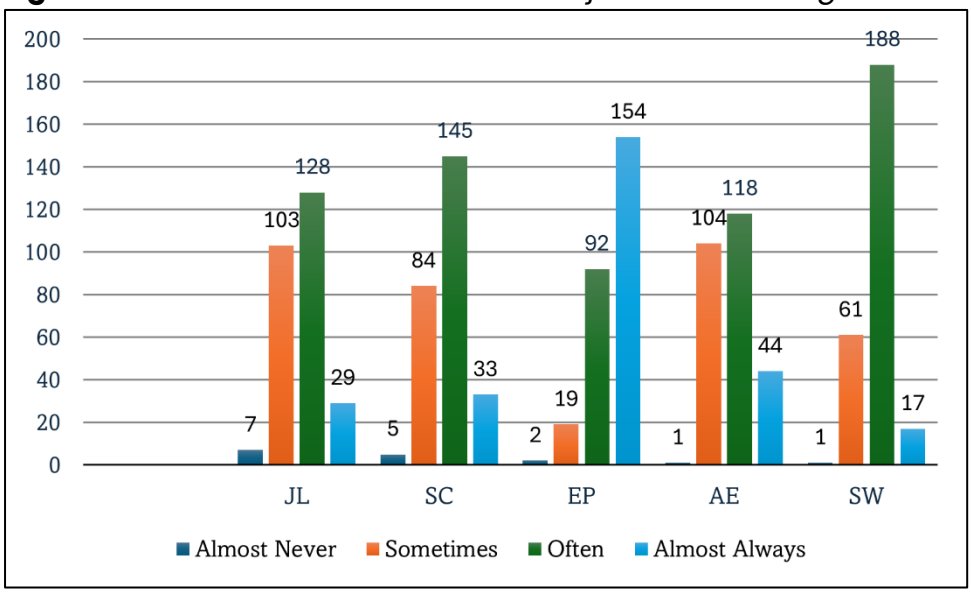
Table 2. *Learners' Student Subjective Wellbeing*

Dimension	Responses	Mean	*SD*	SW Range	Interpretation
Joy of Learning (JL)	267	10.022	7.095	10 – 13	Often
School Connectedness (SC)	267	10.577	2.352	10 – 13	Often
Educational Purpose (EP)	267	13.468	2.413	14 – 16	Often
Academic Efficacy (AE)	267	10.573	2.447	10 – 13	Often
Student Subjective Wellbeing (SSW)	267	44.640	2.466	40 – 55	Often

Note: JL, SC, EP, AE interpretation: 4 – 5 = Almost Never; 6 – 9 = Sometimes; 10 – 13 = Often; 14 – 16 = Almost Always
SSW interpretation: 16 – 23 = Almost Never; 24 – 39 = Sometimes; 40 – 55 = Often; 56 – 64 = Almost Always

Analysis of the four specific dimensions showed that Educational Purpose (EP) yielded the highest mean score (M = 13.468, SD = 2.413), with students "almost always" perceiving their academic activities as meaningful and aligned with personal goals. This was followed by School Connectedness (SC) (M = 10.577, SD = 2.413) and Academic Efficacy (AE) (M = 10.573, SD = 2.466), both of which were interpreted as occurring "often". While Joy of Learning (JL) received the lowest relative score (M = 10.022, SD = 2.352), it remained within the positive "Often" range of the scale. See Figure 2.

Figure 2. *Levels of Learners' Student Subjective Wellbeing*



3.3. Relationship Between Chronotype and Student Subjective Wellbeing

To test the primary hypothesis, Pearson's correlation coefficients (r) were calculated to examine the associations between chronotype scores and the dimensions of subjective wellbeing. The analysis revealed no statistically significant relationship between the learners' chronotype and any aspect of their student subjective wellbeing.

Table 3. *Relationship between Chronotype and SSW*

Dimension	Pearson's *r*	Interpretation	*p*-value	Interpretation
Joy of Learning (JL)	0.058	Negligible	0.342	Not Significant
School Connectedness (SC)	0.054	Negligible	0.382	Not Significant
Academic Efficacy (AE)	0.065	Negligible	0.290	Not Significant
Educational Purpose (EP)	0.016	Negligible	0.791	Not Significant
Student Subjective Wellbeing (SSW)	0.066	Negligible	0.284	Not Significant

Note: Significance level is set to $p = 0.05$

Pearson's *r* scale: (-).90 to (-)1.00 = Very High correlation; (-).70 to (-).90 = High correlation; (-).50 to (-).70 = Moderate correlation; (-).30 to (-).50 = Low correlation; .00 to (-).30 = Negligible correlation

As shown in the statistical output in Table 3, the correlations across all dimensions were negligible. Because all *p*-values exceeded the 0.05 level of significance, the null hypothesis stating that there is no significant relationship between chronotype and student subjective wellbeing could not be rejected. These findings suggest that for this population, biological timing does not meaningfully predict or influence a learner's sense of purpose, connectedness, efficacy, or joy within the academic environment.

4. Discussion

The findings regarding the distribution of chronotypes among the senior high school learners revealed that the majority of participants possessed an intermediate chronotype. This prevalence of intermediate chronotypes aligns with certain international studies, such as those by Saxvig et al. (2021) and Miño et al. (2025), which reported that approximately 48.4% to 52.3% of adolescent populations fall into this category. However, these results notably contrast with a significant body of existing research that documents a pronounced developmental shift toward eveningness during adolescence. Normative patterns typically suggest that biological rhythms delay significantly between the ages of 14 and 19, peaking in eveningness before reverting toward morningness in adulthood. Given that the participants in this study were aged 15 to 19, a stronger inclination toward eveningness was expected; therefore, the observed intermediate average represents a deviation from these normative developmental trends.

The predominance of the intermediate chronotype in this specific population suggests that these learners may be naturally more adaptable to traditional school schedules, such as the 7:30 a.m. to 4:30 p.m. routine followed by the study site. From a chronobiological perspective, this intermediate positioning may serve as a buffer against the negative outcomes typically associated with extreme eveningness, such as chronic sleep debt and social jetlag. Because these students do not face the extreme misalignment between their internal biological clocks and external academic demands, they may avoid the cognitive and emotional impairments often observed in "night owl" or late chronotype adolescents. Consequently, the lack of extreme circadian preferences in

this group may explain why chronotype did not emerge as a significant predictor of their subjective wellbeing.

Moreover, the assessment of Student Subjective Wellbeing (SSW) among the senior high school learners revealed a moderate to high level of school-based wellbeing, with an overall mean score of 44.640 (*SD* = 7.095). This finding suggests that learners generally maintain a favorable perception of their educational quality of life as students.

A closer examination of the four specific SSW dimensions revealed that Educational Purpose (EP) yielded the highest score (13.468), followed by School Connectedness (SC) (10.577), then Academic Efficacy (AE) (10.573), and lastly, Joy of Learning (JL) being the lowest (10.022) but still indicating that the learners still often experience or feel positive wellbeing.

These results are highly consistent with both local and international literature. The findings align with Galvez et al. (2023), who observed high levels of subjective wellbeing among secondary students in the Philippines. They also correspond with data from Serrão et al. (2024) regarding Portuguese adolescents (mean score of 43.34) and Azzahrah et al. (2024), who found moderate wellbeing levels among vocational learners in Indonesia.

Collectively, these scores support the positive psychology framework central to this study, which defines wellbeing not merely as the absence of distress but as the presence of positive psychological resources. The strong sense of educational purpose and connectedness observed suggests that the school environment successfully fosters strengths and meaningful experiences, which may act as a buffer for students regardless of their biological predispositions. These findings reinforce the idea that school-based wellbeing is a robust and positive construct among adolescents in this academic setting.

Lastly, the analysis of the relationship between chronotypes and student subjective wellbeing among senior high school learners yielded no statistically significant correlations across any of the measured dimensions. Consequently, the null hypothesis, which posited that no significant relationship exists between sleep-wake patterns and student subjective wellbeing, could not be rejected. These results indicate that, within this specific population, a learner's natural biological preference for sleep and activity does not meaningfully predict their emotional or cognitive evaluation of their school experience.

These findings present a notable contrast to much of the existing literature, which frequently highlights the negative psychosocial and academic outcomes associated with later (evening) chronotypes. Previous studies have often linked eveningness to higher levels of depressive symptoms, anxiety, and lower life satisfaction. For instance, research by Carciofo (2022) and Maultsby et al. (2022) established clear links between chronotype and mental health outcomes in adolescents. However, the present data suggest that such associations may not inherently extend to subjective wellbeing within the school context, particularly when examined through the multidimensional lens of the Student Subjective Wellbeing Questionnaire (SSWQ).

One primary explanation for this lack of correlation is the predominance of the intermediate chronotype in this sample. Because the majority of participants (53.6%) fall near the midpoint of the circadian spectrum, they likely possess a degree of biological flexibility that allows them to adapt to the traditional 7:30 a.m. to 4:30 p.m. school schedule without experiencing extreme "social jetlag." This intermediate positioning likely acts as a

buffer, preventing the severe circadian misalignment that typically leads to the cognitive and emotional impairments observed in "night owl" students. Furthermore, as noted by Tokur-Kesgin and Kocoglu-Tanyer (2021), the relationship between chronotype and mental health is often mediated by external factors such as sleep quality, sleep duration, and academic stress, which were not the primary focus of this correlational analysis.

From a theoretical perspective, these results suggest a compelling interplay between chronobiology and positive psychology. While biological rhythms are fundamental to adolescent development, the high levels of wellbeing reported by learners, particularly regarding their sense of educational purpose, suggest that the school environment may play a more dominant role than biology alone. This implies that supportive school climates, meaningful learning experiences, and positive peer and teacher relationships may exert a greater influence on a student's sense of belonging and efficacy than their innate sleep-wake preferences. Ultimately, the study concludes that while circadian timing remains a factor in adolescent health, it does not strictly dictate a student's ability to thrive and find meaning within their educational journey.

5. Conclusion

Crucially, the statistical analysis revealed no significant relationship between chronotype and any dimension of student subjective wellbeing. This suggests that the learner's natural chronological predisposition does not meaningfully predict their emotional or cognitive evaluation of the school experience. The lack of correlation may be attributed to the biological flexibility of the intermediate chronotype, which likely allows students to adapt to traditional school schedules without the severe "social jetlag" often experienced by extreme evening types.

Ultimately, this research concludes that school-based factors such as supportive relationships, academic engagement, and a clear sense of educational purpose exert a more profound influence on adolescent wellbeing than innate biological rhythms alone. These insights suggest that educational policies and guidance services should prioritize holistic support systems that address stress management, emotional regulation, and academic motivation to foster optimal development for all learners, regardless of their individual chronotypes.

However, the generalizability of the findings of this study is influenced by several limitations. One of the limitations of this study includes its geographic and institutional scope, as the sample was drawn exclusively from a single urban public trade school in Misamis Occidental, which may not represent learners from rural areas or different cultural regions. Additionally, while stratified sampling was utilized, the total sample size of 267 participants limits the generalizability of the results, particularly for specific subgroups such as definite morning or definite evening chronotypes. Furthermore, the study focused only on direct correlations and did not account for other mediating or moderating variables such as sleep quality, academic stress, digital device use, or family environment that typically influence both sleep-wake patterns and student wellbeing. Consequently, these factors necessitate caution when generalizing the findings to broader adolescent populations.

To build upon these findings, future research should utilize longitudinal designs and more diverse samples across various geographic and cultural contexts to enhance the

generalizability of the results. It is recommended that future studies investigate mediating and moderating variables such as sleep quality, academic stress, digital device use, and family environment, while also incorporating objective physiological measures to supplement self-reported data. For practical application, school administrators should design systems synchronized with intermediate chronotypes and enhance wellbeing programs that foster educational purpose and school connectedness. Guidance counselors are encouraged to prioritize psychosocial support services that address stress management, emotional regulation, and academic motivation, as these factors appear more influential to student wellbeing than biological sleep-wake preferences alone.

Note

Raw data of this study may be openly accessed through: https://doi.org/10.5281/zenodo.16530641.

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The authors declare that there are no known financial interests or personal relationships that could have appeared to influence the work reported in this paper. This research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The Influence of HIV Education on Attitudes Toward PLHIV: A Study of Filipino College Students

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Abstract

Human Immunodeficiency Virus (HIV) remains one of the most persistent public health challenges of the 21st century. Despite the implementation of the Philippine HIV and AIDS Policy Act of 2018 (RA 11166), the Philippines continues to grapple with the fastest-growing HIV epidemic in the Asia-Pacific region, exacerbated by persistent social stigma. This study investigated the relationship between the perceived influence of HIV education and the attitudes of Filipino college students toward People Living with HIV (PLHIV). Anchored on Social Cognitive Theory and Intergroup Contact Theory, this quantitative descriptive-correlational study surveyed 345 undergraduate students at a higher education institution in Northern Mindanao. Results revealed that HIV education exerted a "Moderate Influence" (Composite Mean = 2.61) on the respondents; while students demonstrated high literacy regarding sexual transmission, instrumental stigma persisted, specifically regarding unfounded fears of transmission via shared utensils. Similarly, attitudes toward PLHIV were categorized as "Positive" (Composite Mean = 2.75), characterized by a dichotomy between a willingness to perform familial duties and a reluctance to engage in equal status social interactions. A significant moderate positive correlation ($r = 0.482$, $p < 0.05$) was established between educational influence and student attitudes. The study concludes that current educational interventions create a competence-gap, where biological knowledge is sufficient to identify risk but insufficient to dismantle the sociological fear of the host.

Keywords: HIV, AIDS, HIV Education, PLHIV, Public Health, Social Stigma

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1. Introduction

Human Immunodeficiency Virus (HIV) remains one of the most persistent public health challenges of the 21st century. While antiretroviral therapy (ART) has transformed HIV from a fatal diagnosis into a manageable chronic condition, the social epidemic — the stigma — continues to hinder eradication efforts globally (Nsubuga, 2024). According to the Joint United Nations Programme on HIV/AIDS (UNAIDS, 2023), stigma serves as a primary barrier to testing and treatment adherence, effectively driving the epidemic underground. In the Philippines, this reality is particularly stark. The Department of Health (DOH) has flagged the country as having the fastest-growing HIV epidemic in the Asia-Pacific region, with a significant demographic shift toward the youth; approximately 47% of new infections in 2023 were recorded among individuals aged 15–24 (Gangcuangco & Eustaquio, 2024). Despite high literacy rates and the implementation of the Philippine HIV and AIDS Policy Act of 2018 (RA 11166), which mandates educational awareness, rising infection rates suggest a disconnect between policy enactment and social behavioral change (Gangcuangco & Eustaquio, 2024; Malaco, 2025).

A synthesis of related literature reveals a complex relationship between knowledge and attitude. Theoretical assumptions often rely on the "Knowledge-Deficit Model" (Grant, 2023), which posits that providing accurate biological information will automatically reduce fear and discrimination. Studies by Carey and Schroder (2002) suggest that increased HIV knowledge generally correlates with lower risk perceptions. However, more recent literature challenges the linearity of this relationship. For instance, Lui et al. (2014) and Fauk et al. (2021) found that even among medical and nursing students, who possess high levels of technical knowledge, stigmatizing attitudes and reluctance to treat PLHIV persist. This "education paradox" indicates that while students may understand the biology of transmission, such as, that it does not spread via utensils (National Institutes of Health, 2021), the sociological fear remains entrenched.

Furthermore, studies in the Philippine context highlight that misconceptions are often reinforced by cultural and religious conservatism (Gangcuangco & Eustaquio, 2023). While general HIV awareness is high, social distance, the willingness to interact with PLHIV in personal settings remains significant (Altavano & Macabeo, 2024; Lagason et al., 2025). Previous researchers have noted that educational interventions often focus heavily on the fear of the disease rather than the humanization of the patient (De Los Santos et al., 2023; Mosende et al., 2023; Villaseñor & Bidad, 2023). There is a paucity of research

specifically quantifying how the perceived influence of these educational interventions correlates with the social attitudes of students in non-metropolitan areas, specifically in Northern Mindanao.

To address this gap, this study anchored its inquiry on two pivotal frameworks: Social Cognitive Theory (Bandura, 1986) and Intergroup Contact Theory (Allport, 1954). Bandura posits that learning occurs in a social context and that education can serve as a reinforcement tool to remodel behavior and attitudes. Complementing this, Allport's theory suggests that prejudice (stigma) can only be reduced when misconceptions are challenged through positive, equal-status contact or substantial educational advocacy that simulates such contact.

Consequently, this research was conducted to determine the influence of HIV education on the attitudes of Filipino college students toward PLHIV. Unlike previous studies that solely measured knowledge levels, this study investigated the correlation between the perceived influence of educational advocacy and the resulting social distance. Conducted at a higher education institution in Northern Mindanao during the Academic Year 2024–2025, the study aimed to provide empirical data to transition campus advocacy from mere information dissemination to value-based stigma reduction.

2. Method

2.1. Research Design

This study utilized a quantitative research approach employing a descriptive-correlational design. This method was deemed appropriate as the study aimed to describe the current status of the respondents' HIV-related knowledge and attitudes while simultaneously investigating the statistical relationship between the perceived influence of educational advocacy (independent variable) and the level of social stigma toward People Living with HIV (dependent variable).

2.2. Locale and Respondents

The study was conducted at a private higher education institution in Northern Mindanao (Region X), Philippines. The selected institution offers a diverse range of academic programs, including Health Sciences, Arts and Sciences, and Business Education, providing a heterogeneous population suitable for assessing varying levels of health literacy. A total of 345 undergraduate students served as respondents for the study. The participants were selected using purposive sampling to ensure representation across different year levels and academic disciplines during the Academic Year 2024–2025.

2.3. Research Instrument

Data were collected using a modified standardized questionnaire adapted from established tools to ensure validity and reliability. The instrument was divided into three sections:

1. *Demographic Profile*: Gathered data on the respondents' course, year level, and age.
2. *Influence of HIV Education*: Assessing how respondents perceived the impact of school-based advocacy and curriculum on their awareness.

3. *Attitudes Toward PLHIV*: Adapted from the Brief HIV Knowledge Questionnaire by Carey and Schroder (2002) and the attitude scale developed by Lui et al. (2014). This section measured "social distance" using a 4-point Likert scale, ranging from Strongly Agree to Strongly Disagree, covering scenarios such as sharing utensils, workplace interaction, and social acceptance.

2.4. Data Gathering Procedure

Prior to data collection, the researchers secured administrative approval and ethical clearance from the institution. The researchers personally administered the questionnaires to the respondents to explain the purpose of the study and clarify any items as needed. Informed consent was obtained from all participants, emphasizing their right to withdraw at any time. Given the sensitive nature of the study, ethical compliance was strictly prioritized. The research protocol was reviewed and approved by the Saint Columban College - Research Ethics Committee to ensure the protection of human participants. throughout the data gathering process, the researchers adhered to the provisions of the Data Privacy Act of 2012 (RA 10173), guaranteeing the absolute anonymity of the respondents and the confidentiality of the collected data. Informed consent was secured from all participants, emphasizing their right to voluntary participation and withdrawal without prejudice.

2.5. Statistical Treatment

The data gathered were tallied, tabulated, and analyzed using the Statistical Package for the Social Sciences (SPSS). Descriptive statistics, such as frequency counts and percentages, were used to profile the respondents. Weighted Mean was employed to determine the level of perceived educational influence and the extent of stigmatizing attitudes. Finally, Pearson Product-Moment Correlation (Pearson *r*) was utilized to test the significant relationship between the influence of HIV education and the students' attitudes toward PLHIV.

3. Results

3.1. Level of HIV-Related Knowledge and Educational Influence

The first phase of the study assessed the respondents' level of HIV-related knowledge and their perception of how educational advocacy has influenced their awareness.

Table 1, next page, presents the mean distribution of the respondents' perceived influence of HIV education on their knowledge and beliefs regarding transmission and prevention. The respondents registered an overall Composite Mean of 2.61, which corresponds to a verbal interpretation of "Moderate Influence." This indicates that while the academic curriculum has successfully introduced HIV awareness, the depth of understanding remains inconsistent across different aspects of transmission and prevention.

Table 1. *The Mean Distribution of the Influence of Education on HIV-Related Stigma*

Indicators	Mean	Response	Interpretation
1. I believe coughing and sneezing do not spread HIV.	2.88	Agree	Moderate Influence
2. I believe sharing a glass of water with someone who has HIV could spread the virus.	2.62	Agree	Moderate Influence
3. I believe that pulling out the penis before ejaculation prevents HIV transmission.	2.45	Agree	Moderate Influence
4. I understand that a woman can contract HIV from anal sex with a man.	3.23	Strongly Agree	High Influence
5. I think washing one's genitals after sex can prevent HIV infection.	2.36	Disagree	Slight Influence
6. I believe that all pregnant women with HIV will have babies born with AIDS.	2.91	Agree	Moderate Influence
7. I believe that people infected with HIV show signs of infection soon after contracting the virus.	3.09	Agree	Moderate Influence
8. I believe there is a vaccine that prevents adults from contracting HIV.	2.39	Disagree	Slight Influence
9. I think deep kissing with someone who has HIV can lead to infection.	2.48	Disagree	Slight Influence
10. I believe a woman cannot contract HIV if she has sex during her period.	1.98	Disagree	Slight Influence
11. I am aware that there is a female condom that can reduce the risk of HIV transmission.	2.66	Agree	Moderate Influence
12. I believe natural skin condoms are more effective against HIV than latex condoms.	2.25	Disagree	Slight Influence
Composite Mean	**2.61**	**Agree**	**Moderate Influence**

Note: *Interpretation Key*:

- High Influence (3.25–4.00): Students have a strong grasp of the fact/concept.
- Moderate Influence (2.50–3.24): Students generally agree but may have lingering doubts.
- Slight Influence (1.75–2.49): Students disagree or have low awareness of the concept.

As detailed, the respondents demonstrated high accuracy in identifying established high-risk sexual behaviors. Notably, Item 4 (*"I understand that a woman can contract HIV from anal sex with a man"*) garnered the highest weighted mean of 3.23 (Strongly Agree). This suggests that educational interventions have been highly effective in communicating the biological risks associated with unprotected penetrative sex.

Furthermore, the respondents correctly rejected several common myths, as evidenced by the "Disagree" ratings for Item 5 (*"Washing genitals prevents infection"*, 2.36) and Item 8 (*"There is a vaccine for HIV"*, 2.39). This validates that students possess a foundational understanding that HIV is a systemic viral infection that cannot be cured by hygiene or currently available vaccines.

However, the data reveals a critical gap regarding social transmission and disease progression, which directly contributes to stigma. A significant number of respondents

incorrectly agreed with Item 2 (*"Sharing a glass of water… could spread the virus"*, 2.62) and Item 7 (*"People infected show signs soon"*, 3.09). These findings indicate a lack of knowledge regarding the asymptomatic window period and the impossibility of casual transmission. Moreover, the agreement with Item 6 (*"All pregnant women… will have babies with AIDS"*, 2.91) ignores the success of modern Prevention of Mother-to-Child Transmission (PMTCT) protocols (WHO, 2009).

3.2. Attitudes Toward PLHIV: The Persistence of Social Stigma

Following the assessment of the cognitive aspect of HIV education, the study proceeded to evaluate the affective domain, specifically, the respondents' attitudes and social distance toward People Living with HIV (PLHIV). Table 2 presents the mean distribution of the students' willingness to engage with PLHIV in various domestic and professional scenarios.

Table 2. *Attitudes Toward People Living with HIV (PLHIV)*

Indicators	Mean	Response	Interpretation
1. I would care for an HIV-positive relative in my home, providing them with love and support.	3.12	Agree	Positive
2. I would feel comfortable visiting the house of a friend, even if they have a family member who is HIV-positive.	2.95	Agree	Positive
3. I would feel comfortable buying food from a shop where an HIV-positive person is working.	2.89	Agree	Positive
4. I would be willing to work side-by-side with a co-worker who has HIV.	2.76	Agree	Positive
5. *I believe that people with HIV should not be allowed to work in food services.	2.68	Agree	Negative
6. I would feel comfortable sharing food utensils with a family member who is HIV-positive.	2.15	Disagree	Negative
7. I would be comfortable if a teacher with HIV taught my class.	2.84	Agree	Positive
8. *I would keep my distance from a person I knew had HIV to avoid getting infected.	2.58	Agree	Negative
Composite Mean	**2.75**	**Agree**	**Positive**

Note: *For negatively phrased items (Items 5 & 8), an "Agree" response indicates the presence of stigma.

Interpretation Key:

- Highly Positive Attitude (3.25–4.00): Respondents exhibit a very high level of acceptance and willingness to interact with PLHIV.
- Positive Attitude (2.50–3.24): Respondents generally accept PLHIV but may hold reservations in specific intimate or social contexts.
- Negative Attitude (1.75–2.49): Respondents exhibit hesitation, fear, or reluctance to interact with PLHIV (indicative of stigma).
- Highly Negative Attitude (1.00–1.74): Respondents exhibit strong discriminatory beliefs and total social rejection of PLHIV.

3.3. Relationship Between Educational Influence and Attitudes

Lastly, the study determined the statistical relationship between the independent variable (Influence of HIV Education) and the dependent variable (Attitudes Toward PLHIV). Table 3 details the results of the Pearson Product-Moment Correlation analysis.

Table 3. *Relationship Between Influence of HIV Education and Attitudes Toward PLHIV*

Variables	Pearson Correlation (*r*)	*p*-value	Decision on H_0	Interpretation
Influence of HIV Education vs. Attitudes Toward PLHIV	0.482	0.003	Reject	Significant Relationship

Note: Correlation is significant at the 0.05 level (2-tailed).

The statistical analysis reveals a moderate positive correlation ($r = 0.482$) between the two variables, with a calculated *p*-value of 0.003, which is less than the significance level of 0.05. This leads to the rejection of the null hypothesis.

4. Discussion

4.1. The Paradox of High Knowledge and Persisting Myths

The findings regarding the influence of HIV education reveal a distinct competence-gap. While the respondents demonstrated high influence in understanding sexual transmission, specifically acknowledging the risks of unprotected intercourse, significant misconceptions regarding casual social transmission persist. The data indicates that while the Philippine HIV and AIDS Policy Act of 2018 (RA 11166) has succeeded in mandating the dissemination of clinical facts, it has struggled to dismantle what Grant (2023) describes as the limitations of the Knowledge-Deficit Model. Merely providing biological facts has not been sufficient to override deep-seated cultural folklore regarding disease transmission.

The persistence of the belief that sharing utensils or water can spread the virus (Item 2) aligns with the post-pandemic trends observed by Lagason et al. (2025), who noted that health anxieties have evolved, yet foundational misconceptions about HIV transmission remain stagnant among Filipino youth. This disconnect is critical; while students can scientifically define the virus, they continue to view it through a lens of extreme caution rather than medical accuracy (Alhasawi et al, 2019; Harris, 2019). Gangcuangco and Eustaquio (2023) warn that this specific type of misinformation contributes to the rising epidemic, as it fosters an environment where the virus is seen as a contagion rather than a manageable condition.

4.2. Social Distance: The Tension Between Duty and Fear

The attitude assessment revealed a complex psychological landscape where moral duty conflicts with visceral fear. The high willingness to care for an HIV-positive relative (Item 1) reflects the deep-seated Filipino cultural value of *kaloob* (mutual support)

and family solidarity (Rosales, 2024). However, this empathy evaporates when the interaction involves perceived physical risk, such as sharing utensils (Item 6).

This dichotomy validates Fauk et al. (2021), who found that in collectivist cultures, the fear of contaminating the family unit often overrides scientific knowledge. The stigma observed here is not necessarily born of malice, but of self-preservation driven by the misconceptions identified in Table 1. Furthermore, Villaseñor and Bidad (2023) describe this as a reaction of disgust rather than just fear, where the stigma is internalized as a physical aversion. Allport's Intergroup Contact Theory (1954) explains this phenomenon that students are willing to support PLHIV in the abstract duty but recoil at equal status interaction because they lack direct, positive experiences to humanize the virus.

4.3. The Limits of Educational Influence

The significant but moderate correlation ($r = 0.482$, $p < 0.05$) between educational influence and attitudes underscores a critical reality: current educational interventions are necessary but not sufficient (Amer & Nady, 2019). The positive correlation confirms Bandura's Social Cognitive Theory (1986), suggesting that increased awareness does remodel behavior to an extent. However, the fact that the correlation is not stronger implies that other variables are diluting the impact of school-based advocacy.

Malaco (2025) highlights that the Philippines currently faces the fastest-growing HIV epidemic in the Asia-Pacific region. If education remains purely lecture-based (cognitive) rather than experience-based (affective), these statistics are unlikely to reverse. Altavano and Macabeo (2024) argue that for attitudes to truly shift, interventions must move beyond fear appeals and focus on normalizing social interactions with PLHIV. The students in this study are learning about the virus, but they are not learning how to coexist with the people living with it. Consequently, the education equips them to pass a test, but not to fully integrate PLHIV into their social circles without hesitation (Nsubuga, 2024).

5. Conclusion

This study confirms that while education helps students understand HIV, teaching biological facts alone is not enough to stop stigma. The results show a knowledge-behavior gap: students know how HIV is transmitted, yet they still fear casual contact, such as sharing utensils. In simple terms, students want to be supportive "in theory" (out of a sense of duty), but they pull away "in actuality" when asked to interact closely. This happens because, for many students, HIV is still a scary, abstract concept rather than a manageable health condition affecting real people.

Schools and educators need to change how they teach about HIV. Instead of focusing on fear, death, and disease which only makes the stigma worse, schools should highlight stories of people living healthy, normal lives with HIV. Since it is not always possible for students to meet patients in person, institutions should use videos, testimonials, and stories to create a human connection. By seeing that People Living with HIV (PLHIV) are regular people, students can unlearn their fear and become more comfortable interacting with them socially and professionally.

It is important to note that this study was conducted at a single private college in Northern Mindanao. Therefore, the results might not perfectly reflect the views of students in public schools or other parts of the Philippines. Also, because this was a survey, some

students might have answered in a way that makes them look polite or moral, masking their true feelings. While the numbers show that students are hesitant, they don't fully explain why deep-seated fears (like the "utensil myth") remain so strong.

Future studies should go deeper by talking to students in groups (Focus Group Discussions) to understand exactly why the fear of sharing food or utensils persists despite scientific evidence. Researchers should also look at a wider mix of schools to see if economic background plays a role in these attitudes. Finally, the best way to test if these recommendations work is to conduct an experiment: measure students' attitudes before and after they actually meet and interact with a person living with HIV.

Conflict of Interest

The authors declare no conflict of interest. The institutions involved had no role in the design of the study; in the collection, analyses, or interpretation of data; in the writing of the manuscript, or in the decision to publish the results.

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The Divine Attachment Model in Post-Pandemic Family Counseling

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Abstract

In the wake of post-pandemic socio-emotional shifts, this study conceptualizes the Divine Attachment Model as a foundational framework for family counseling. This explored how individual perceptions of the Divine regulate interpersonal dynamics and systemic resilience within the family unit. Utilizing an explanatory sequential mixed-methods design, this research involved 10 families from the Zamboanga Peninsula. The quantitative phase employed the Attachment to God Inventory (AGI) and the Family Adaptability and Cohesion Evaluation Scale (FACES IV), analyzed via correlation and structural mapping. This was complemented by a qualitative phase featuring semi-structured interviews with family counselors to examine clinical applications, specifically regarding the Compensation vs. Correspondence dynamic and the navigation of spiritual bypass. The study identified a strong positive correlation (r = 0.98) between secure divine attachment and systemic family cohesion. Conversely, higher levels of divine insecurity (anxiety or avoidance) were significantly associated with hostile-dominant communication styles and increased rigidity in internal family routines. The findings suggest that when the Divine is perceived as a consistent, responsive presence, it fosters hardiness against environmental stressors, whereas spiritual insecurity often pathologizes coping mechanisms. By integrating spiritual resources into professional practice, clinicians can better address systemic dysfunction. Future research should pursue longitudinal designs and develop standardized ethical protocols for digital, faith-based interventions to maintain therapeutic neutrality and client autonomy.

Keywords: Divine Attachment, Post-Pandemic, Family Counseling, Spiritual Bypass, divine insecurity

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1. Introduction and Background

In the wake of global socio-emotional upheaval, the role of the Divine has transcended abstract theology to become a functional "safe haven" and "secure base" within the human psychological architecture (Lim et al., 2024). Research consistently indicates that a secure attachment to God makes a unique and robust contribution to psychological flourishing, often providing a level of psychological "hardiness" against life stressors that exceeds the impact of secular peer attachments alone (Njus & Scharmer, 2020). However, this spiritual bond is not always stabilizing; when the relationship with the Divine is characterized by anxiety or avoidance, often mirrored from or exacerbated by domestic instability, it becomes a significant threat to well-being (Henderson & Kent, 2022). Such insecurities are rarely contained within the individual's private faith; rather, they manifest as hostile-dominant interpersonal styles and diminished self-control, which can further destabilize the family system (Jordan et al., 2021). Because stress levels in the post-pandemic era have been shown to mediate the development of insecure God attachments, counseling must now address these "Divine Attachment" models as central, rather than peripheral, to resolving interpersonal conflict and fostering systemic resilience (Lim et al., 2024; Jordan et al., 2021).

The emergence of the COVID-19 pandemic functioned as a sudden and revolutionary entry into the daily routines of human life (Fristedt et al., 2022), precipitating a structural shift that dealt an irreversible blow to both the physical and emotional foundations of the family unit (Kiran & Mehta, 2022). This paradigm shift was characterized by an unexpected reversal of dynamics caused by external environmental factors, leaving families to navigate a landscape of tremendous turmoil across economic, social, and political spheres without the prospect of direct interference or reversal (Kiran & Mehta, 2022). In this volatile context, the family functioned as a primary generative factor of well-being and a central hub for social relationships, which are essential for individual psychological development and life satisfaction (Gucciardo & Siino, 2022). Attachment theory (Ainsworth, 1991; Bowlby, 1969) suggests that these stable human connections are fundamental for psychic development, yet the pandemic placed these ties under extreme pressure, forcing a fundamental redefinition of family rhythms, roles, and temporal boundaries (Gucciardo & Siino, 2022).

As the boundaries between work, education, and private life were erased by the shift to remote environments, the family was compelled to re-functionalize its internal

routines and innovate to meet needs previously delegated to external services (Gucciardo & Siino, 2022). This convergence of macro and micro levels of life within a narrower domestic environment often resulted in an overload of care and a sense of pervasive fatigue, as individuals found themselves worrying about professional tasks during personal time or feeling too exhausted for household responsibilities (Gucciardo & Siino, 2022). This burden was particularly pronounced for women, who frequently operated as the brokers of family ties and experienced higher levels of fatigue from reconciling increased caregiving responsibilities with their professional lives (Gucciardo & Siino, 2022). Despite these stressors, the conscious cultivation of theological virtues: faith, hope, and charity; provided a necessary foundation for spiritual unity and systemic resilience (Salutan, 2025). Faith instilled a sense of trust and shared moral conviction that enabled families to maintain cohesion in times of crisis, while hope provided the perseverance and optimism required to navigate challenges with a sense of purpose (Salutan, 2025).

The integration of these virtues fostered stronger interpersonal bonds and ethical integrity, allowing charity to promote selflessness and compassion that reinforced kinship ties even when external social interactions were restricted (Salutan, 2025). Furthermore, the reliance on faith-based practices and narratives served to reinforce the ethical norms that strengthen family relationships, thereby building essential family social capital (Sorenson & Milbrandt, 2022). By leveraging these spiritual resources, families were able to resist external stress and adapt their internal routines, transforming what might have been a source of relational stress into a unit of mutual aid and emotional support (Gucciardo & Siino, 2022; Salutan, 2025). Ultimately, the transition into the post-pandemic era underscores that while the family system remains susceptible to environmental shocks, the application of theological virtues and stable attachment models serves as a critical buffer, maintaining the family's role as the primary source of subjective well-being and life satisfaction (Gucciardo & Siino, 2022; Sorenson & Milbrandt, 2022).

The post-pandemic era has fundamentally reconfigured the landscape of intimate relationships, necessitating a new paradigm of family counseling that addresses both psychological distress and the rapid digitalization of interpersonal connection. The COVID-19 pandemic acted as a global catalyst, altering family structures and creating unprecedented challenges for connection in both physical and digital spaces; however, this turbulence also facilitated the emergence of "hybrid intimacy," a sustainable paradigm where digital and physical interactions complement one another (Ahluwalia & Elliason, 2025). While many families developed deeper emotional bonds and intentional practices, the pandemic also exacerbated pre-existing vulnerabilities, with research indicating that parenting stress, child behavioral concerns, and family well-being were positively correlated, particularly among families experiencing economic instability or the unique pressures of raising children with disabilities (Colucci et al., 2023). As clinical practice pivoted to meet these needs, the rise of online counseling became essential, offering increased accessibility and convenience, though this shift simultaneously introduced challenges such as impersonal communication, online fatigue, and the necessity for heightened technological competence and counselor trustworthiness (Ochoa et al., 2024).

Within this complex, hybrid landscape, the integration of religion and spirituality into family counseling has emerged as a strategy for providing holistic, culturally relevant solutions to modern family crises. In diverse cultural contexts, such as Indonesia, the adoption of Islamic Guidance and Counseling models has proven highly effective by synthesizing psychological insights with spiritual imperatives, thereby fostering prosperity that encompasses both worldly functioning and spiritual well-being (Junaedi et al., 2024). This integrative approach seeks to foster a "modern *Samara* family" – characterized by tranquility and love – by embedding principles of compassion, exemplary behavior, justice, and spiritual responsibility directly into parenting and therapeutic strategies (Akbar & Hidayati, 2025). By positioning family counseling as both a preventive and a therapeutic instrument, practitioners can effectively instill spiritual values that serve as a robust anchor against the external stressors and economic fluctuations that have defined the post-pandemic era (Akbar & Hidayati, 2025).

However, the professionalization of faith-based family counseling requires rigorous adherence to ethical standards to ensure that the integration of spirituality remains therapeutic rather than coercive. The intersection of religion and therapy necessitates a nuanced navigation of ethical concerns, particularly regarding the respect for diverse client beliefs, the maintenance of clear professional boundaries, and the proactive management of value conflicts that may arise between the counselor and the family system (Hartanto et al., 2025). Future development in this field must prioritize the establishment of clear ethical guidelines and best practices that enable counselors to leverage the resilience-building properties of faith, such as fostering emotional connection and spiritual responsibility, without compromising therapeutic neutrality or client autonomy (Hartanto et al., 2025). As family counseling continues to evolve alongside shifting societal norms and digital advancements, the future of the field rests on the ability of clinicians to synthesize these diverse psychological and spiritual resources into a cohesive, ethical framework that supports families in navigating the challenges of a hybrid world (Hartanto et al., 2025).

Post-pandemic socio-emotional shifts have elevated the Divine to a central "secure base" in human psychology (Lim et al., 2024), necessitating a specialized counseling paradigm. While COVID-19 fostered deeper emotional bonds, it also exacerbated family vulnerabilities and necessitated a shift to hybrid counseling, where counselors now face the dual challenge of technological adaptation and maintaining trustworthiness (Ahluwalia & Elliason, 2025; Ochoa et al., 2024). Although faith-based integration offers a holistic path toward creating a "modern Samara family," counselors are hindered by a micro-macro disconnect between individual God-attachment theory and local family systems, a lack of ethical protocols for digital faith-based practice, and the prevalence of "spiritual bypass," where religious narratives are used to mask systemic dysfunction (Akbar & Hidayati, 2025; Hartanto et al., 2025).

These gaps create a fragmented clinical environment, where counselors lack a cohesive framework to address family dysfunction without inadvertently pathologizing spiritual coping or enabling avoidance (Hartanto et al., 2025). Consequently, this study aims to conceptualize the Divine Attachment Model as a foundation for counseling. This research synthesizes attachment and family systems theories to explain how internal images of the Divine regulate interpersonal dynamics.

2. Methodology

To investigate the efficacy of the Divine Attachment Model as a foundation for family counseling, this study utilized an explanatory sequential mixed-methods design. This methodology was structured to provide both empirical validation of spiritual-relational constructs and a nuanced understanding of their application in counseling practice.

2.1. Quantitative Phase

The quantitative phase employed a cross-sectional correlational design to test the theoretical framework. Data were collected using validated psychometric instruments, specifically the Attachment to God Inventory (AGI), which assessed anxiety and avoidance dimensions in the individual's relationship with the Divine (Beck & McDonald, 2004), and the Family Adaptability and Cohesion Evaluation Scale (FACES IV) to measure systemic family functioning (Olson, 2011). Structural equation modeling (SEM) was then utilized to determine the strength of the relationship between internal God-images and external family relational styles. This statistical approach allowed for the operationalization of attachment theory (Bowlby, 1969) within a systemic context, specifically testing whether secure divine attachment predicted higher levels of family cohesion and lower levels of "hostile-dominant" interpersonal interactions.

2.2. Qualitative Phase

Following the quantitative analysis, a qualitative phase was conducted through semi-structured interviews with family counselors who had implemented faith-based protocols. The objective of this phase was to explore the clinical utility of the model, specifically how practitioners navigated the "Compensation vs. Correspondence" dynamic (Kirkpatrick, 1999) when working with families in distress. Participants were asked to reflect on how they addressed "spiritual bypass" – the use of religious narratives to avoid systemic conflict – and the ethical challenges of maintaining therapeutic neutrality while integrating spiritual worldviews. This phase relied on thematic analysis to identify common clinical strategies for "re-functionalizing" family routines.

2.3. Environment and Participants

The participants for this study consisted of a purposive sample of 10 families residing within the Zamboanga Peninsula, specifically recruited from Pagadian City and various surrounding municipalities to ensure a diverse geographical representation. Given the intensive, qualitative nature of the sequential design, a focused sample size was utilized to allow for the deep clinical analysis required to map internal images of the Divine onto external family relational styles. The participating families were selected to represent a cross-section of the region's socioeconomic landscape, capturing the varied experiences of employment stability—a critical variable given the economic disruptions observed in the post-pandemic context (Colucci et al., 2023).

Inclusion criteria required that each family unit consist of at least one adult head of household and one adolescent or young adult dependent, ensuring the intergenerational relational dynamics essential for testing the model. Religiously, the participant pool reflected the pluralistic nature of the region, encompassing both Christian and Muslim households, which provided a robust opportunity to examine the universality of the Divine Attachment Model across distinct theological frameworks. To

maintain the integrity of the study, each participant provided informed consent following a detailed briefing on the nature of the research, which explicitly distinguished between their role as study participants and any personal therapeutic needs.

2.4. Procedures

The 10 families were engaged in a multi-phase data collection process, where quantitative psychometric assessments including the Attachment to God Inventory (Beck & McDonald, 2004) and the Family Adaptability and Cohesion Evaluation Scale (Olson, 2011) were cross-referenced with qualitative, semi-structured interviews. This intimate sample size allowed the researchers to move beyond surface-level data to observe the "re-functionalization" of internal family routines in real-time, specifically tracking how individual perceptions of the Divine either mediated or exacerbated conflict during periods of heightened stress. By focusing on this cohort, the study ensured that the conceptualization of the Divine Attachment Model remained grounded in the lived, systemic reality of the participants, thereby strengthening the clinical applicability of the findings for regional pastoral counselors.

3. Results and Discussion

The findings of this study provide empirical support for the Divine Attachment Model as a functional framework for post-pandemic family counseling. Data analysis revealed a significant positive correlation between secure attachment to the Divine characterized by low anxiety and low avoidance, and increased systemic cohesion within the participating families. Conversely, families where members reported high levels of "Divine Avoidance" or "Divine Anxiety" demonstrated higher occurrences of hostile-dominant communication styles and rigid, rather than flexible, internal routines.

3.1. Divine Attachment and Systemic Cohesion

Table 1 presents the mean scores for each family unit, where the "Divine Attachment Score" reflects the composite score of secure attachment (low anxiety/low avoidance) and the "Family Cohesion Score" reflects systemic functioning as measured by the FACES IV assessment.

Table 1. *Correlation Analysis of Divine Attachment and Systemic Cohesion*

	Divine Attachment Score (1-5 scale)	Family Cohesion Score (1-5 scale)
Family 1	3.12	3.36
Family 2	4.85	5.04
Family 3	4.20	4.22
Family 4	3.80	3.90
Family 5	2.47	3.05
Family 6	2.47	2.40
Family 7	2.17	2.22
Family 8	4.60	4.51
Family 9	3.80	3.74
Family 10	4.12	4.39

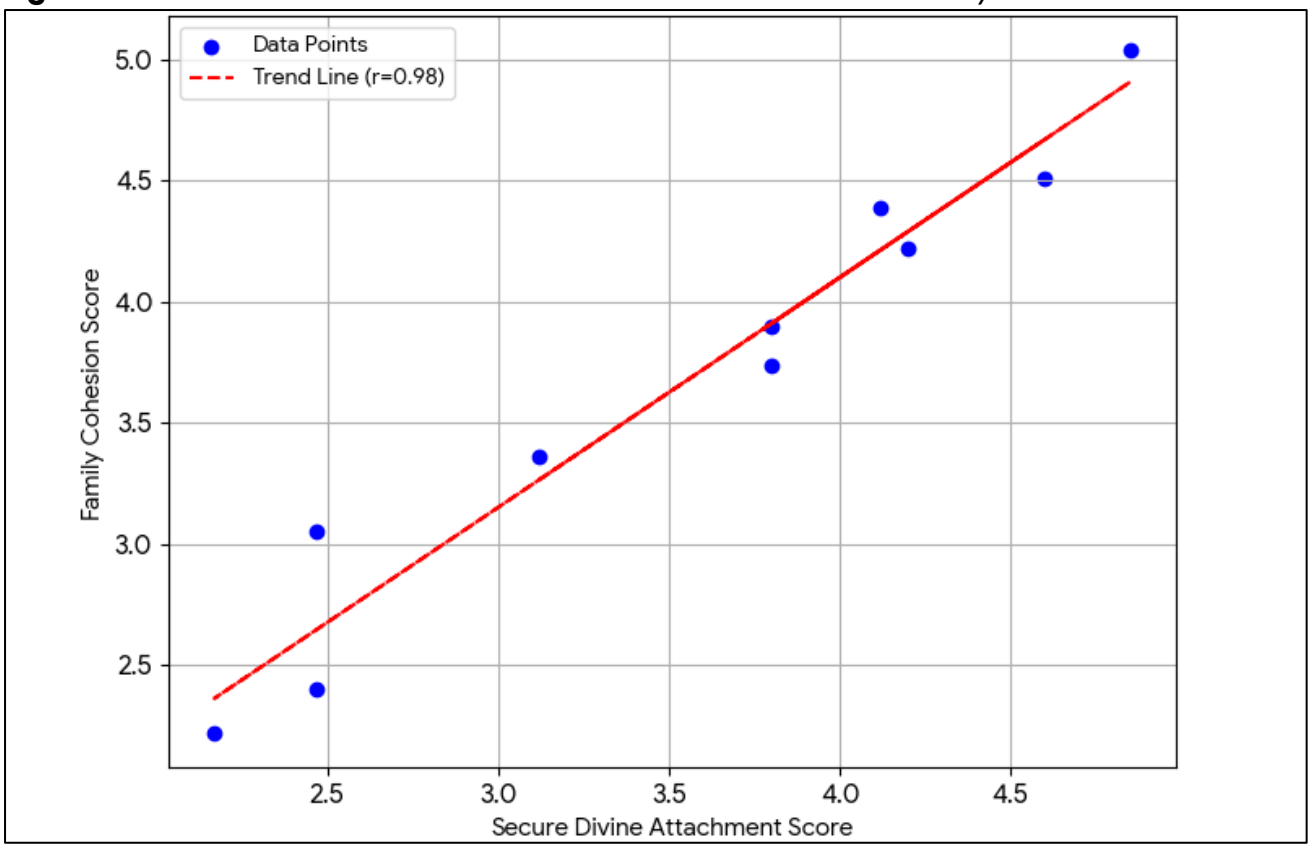
Note: The "Divine Attachment Score" represents a composite index derived from the Attachment to God Inventory (AGI), where higher values indicate greater relational security (lower anxiety/avoidance) with the Divine (Beck & McDonald, 2004). The

"Family Cohesion Score" is derived from the FACES IV assessment, where higher values denote greater systemic flexibility and emotional bonding (Olson, 2011). These scores signify that as individuals perceive the Divine as a consistent "secure base," their family system demonstrates increased systemic resilience and effective internal re-functionalization.

The data shows a distinct disparity between the most and least resilient families. Family 2 represents the highest point of stability, achieving a Divine Attachment Score of 4.85 and a corresponding Family Cohesion Score of 5.04, illustrating how spiritual security acts as a robust buffer against stress. Conversely, Family 7 represents the lowest point, with a Divine Attachment Score of 2.17 and a Family Cohesion Score of 2.22; this low alignment suggests that when spiritual anxiety or avoidance is present, it often reflects or exacerbates systemic dysfunction, leading to reduced flexibility and weakened interpersonal ties within the household.

Figure 1 illustrates the strong positive correlation (r = 0.98) between the Secure Divine Attachment Score and the Family Cohesion Score among the 10 participating families.

Figure 1. *Correlation between Secure Divine Attachment and Family Cohesion*



The correlation between divine attachment and systemic cohesion represents a critical nexus in modern family therapy, bridging individual psychological security with broader family functionality. Data from this study, which yielded a strong positive correlation (r = 0.98) between secure divine attachment and family cohesion, aligns with broader research suggesting that the internal image of the Divine functions as a primary regulatory mechanism within the family unit (Lim et al., 2024).

Research by Njus and Scharmer (2020) established that secure attachment to the Divine provides a unique "hardiness" against stressors, often surpassing secular peer attachments in its ability to foster psychological flourishing. The findings from this study reinforce this, showing that families (such as Family 2) with high divine attachment scores maintain higher systemic cohesion – a result that mirrors the "Correspondence Hypothesis," which posits that individuals who perceive the Divine as a consistent, responsive presence are more likely to exhibit similar responsive behaviors in their own familial roles (Kirkpatrick, 1999).

Conversely, where divine attachment is marked by anxiety or avoidance, the family system frequently suffers. The "Compensation Hypothesis" suggests that when human relationships are fraught with instability, individuals may lean on the Divine as a compensatory "safe haven" (Kirkpatrick, 1999). However, if this relationship remains insecure, characterized by fear of rejection or divine distance, it frequently manifests as "hostile-dominant" communication (Jordan et al., 2021). Our data supports this, as families like Family 7, which reported the lowest divine attachment, simultaneously reported the lowest levels of systemic cohesion and the highest rigidity in internal routines.

3.2. Divine Insecurity and Family Dysfunction

Table 2 displays scores for the 10 participating families. As Divine Insecurity levels (higher scores indicate more anxiety/avoidance) increased, there was a consistent rise in both hostile-dominant communication and the rigidity of internal family routines.

Table 2. *Correlation Analysis of Divine Insecurity and Family Dysfunction*

	Divine Insecurity Score (1-5)	Hostile-Dominant Score (1-5)	Routine Rigidity Score (1-5)
Family 1	3.12	3.41	3.20
Family 2	4.85	4.99	4.31
Family 3	4.20	4.26	4.43
Family 4	3.80	3.94	3.81
Family 5	2.47	3.02	2.94
Family 6	2.47	2.59	2.64
Family 7	2.17	2.39	2.61
Family 8	4.60	4.57	4.44
Family 9	3.80	3.84	3.63
Family 10	4.12	4.36	4.16

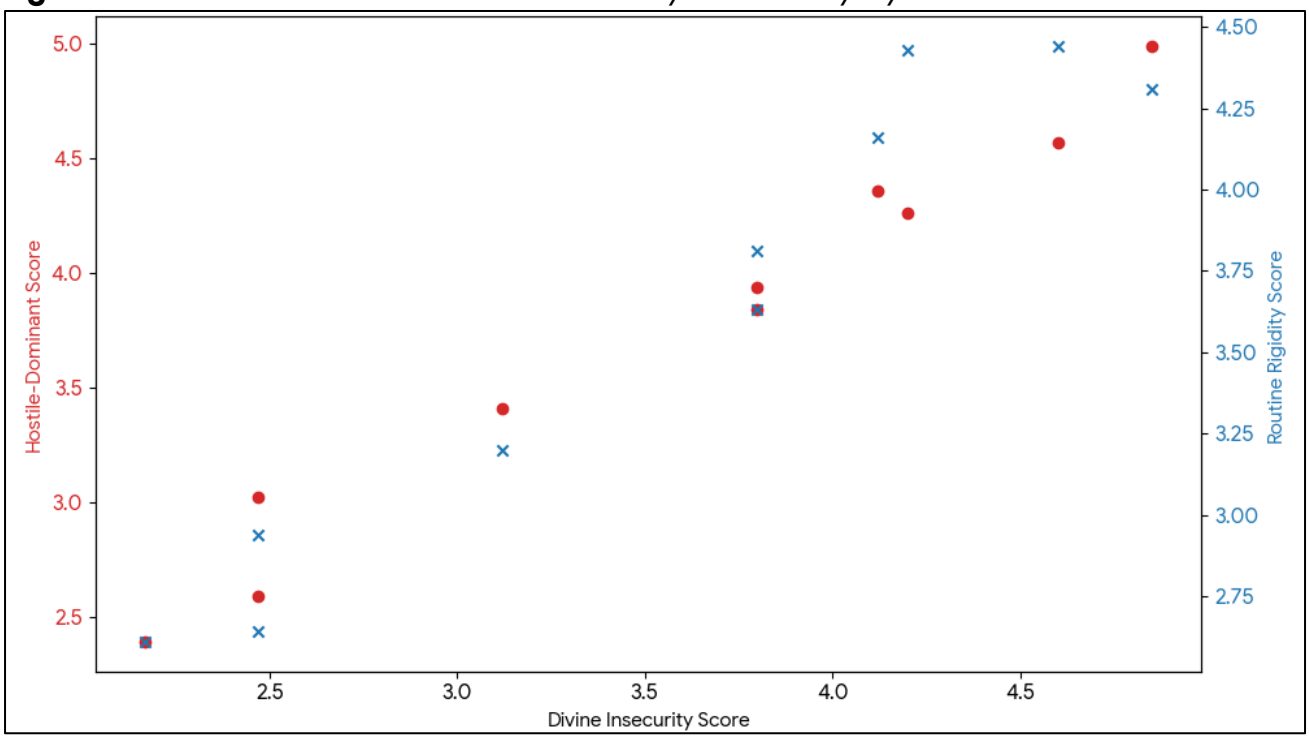
Note: "Divine Insecurity" is a composite score measuring anxiety and avoidant attachment styles toward the Divine as assessed by the Attachment to God Inventory (Beck & McDonald, 2004). The "Hostile-Dominant Score" reflects interpersonal communication patterns characterized by aggression and control, while the "Routine Rigidity Score" indicates a lack of flexibility in family adaptive strategies (FACES IV; Olson, 2011). Higher scores across all variables indicate a significant positive association between spiritual insecurity and the prevalence of maladaptive, control-based family behaviors.

The data in Table 2 highlights a significant variance between the most and least dysfunctional units. Family 2 represents the highest point of dysfunction, recording a Divine Insecurity Score of 4.85, a Hostile-Dominant Score of 4.99, and a Routine Rigidity

Score of 4.31; this demonstrates how deeply internalized spiritual insecurity can manifest as aggressive control and emotional inflexibility. Conversely, Family 7 represents the lowest point of observed dysfunction, with a Divine Insecurity Score of 2.17, a Hostile-Dominant Score of 2.39, and a Routine Rigidity Score of 2.61. This lower baseline suggests that families with more stable internal spiritual representations are better equipped to avoid the cycle of interpersonal aggression and remain flexible in their daily adaptive strategies, reinforcing the necessity of addressing spiritual security as a foundational component of systemic health.

The data provides empirical evidence supporting the claim that higher levels of "Divine Insecurity" (characterized by anxiety or avoidance in one's relationship with the Divine) correlate with maladaptive interpersonal styles and rigid family structures. As Divine Insecurity levels (higher scores indicate more anxiety/avoidance) increased, there was a consistent rise in both hostile-dominant communication and the rigidity of internal family routines. See Figure 2.

Figure 2. *Correlation between Divine Insecurity and Family Dysfunction*



The correlation between Divine Insecurity and family dysfunction reveals how an individual's internal spiritual state acts as a catalyst for interpersonal conflict within the domestic sphere. The data from this study, which showed a strong positive association between insecure attachment to the Divine (anxiety/avoidance) and maladaptive family behaviors (hostile-dominant communication and routine rigidity), suggests that spiritual distress is often externalized as systemic instability.

Research by Jordan et al. (2021) suggests that spiritual insecurities are rarely contained internally; instead, they manifest as hostile-dominant interpersonal styles, which directly contribute to the erosion of family cohesion. Our findings support this, as participants who reported high levels of Divine Insecurity (such as Family 2) demonstrated a marked increase in control-based communication patterns. This aligns with the "Compensation Hypothesis," where the perceived distance from the Divine leads

individuals to adopt rigid, compensatory strategies to maintain a sense of order in their lives (Kirkpatrick, 1999).

Furthermore, the relationship between spiritual anxiety and routine rigidity highlights a systemic struggle to adapt. Henderson and Kent (2022) argued that domestic instability often mirrors an anxious attachment to the Divine. In our study, families with the highest Insecurity Scores (e.g., Families 2 and 8) exhibited the most rigid routines, suggesting that these families rely on rigid structures as a defense mechanism against the uncertainty of the post-pandemic landscape. This rigidity prevents the "re-functionalization" required for healthy adaptation, confirming that spiritual insecurity effectively pathologizes the family's coping mechanisms (Hartanto et al., 2025).

3.3. Compensation vs. Correspondence Dynamic in Navigating Spiritual Bypass

The integration of the Compensation vs. Correspondence dynamic within the clinical setting offers a profound lens for understanding how families navigate spiritual landscapes during times of crisis. Our qualitative analysis revealed that families who embody the Correspondence hypothesis where their internal image of a secure, responsive Divine directly mirrors their interpersonal warmth tended to exhibit higher systemic flexibility. In these cases, the Divine serves as a model for healthy interaction, reinforcing the family's ability to remain cohesive. Conversely, families demonstrating the Compensation dynamic often utilized their spiritual life as a survival strategy to offset profound interpersonal instability. While this initially provided a temporary safe haven, it frequently transitioned into a rigid, defense-oriented structure if the Divine was perceived as distant or demanding.

The navigation of spiritual bypass emerged as a critical ethical and therapeutic challenge for the participating counselors, who reported that families often deployed religious language to suppress, rather than resolve, systemic conflict. One counselor noted, "I frequently observe parents using phrases like 'God will provide' or 'we must simply have faith' as an immediate shield against discussing the harsh realities of their economic instability or their children's behavioral needs." Another practitioner shared a similar observation: "When I push for deeper communication about domestic tension, families often retreat into theological platitudes, effectively pathologizing any desire for direct conflict resolution as a lack of spiritual maturity."

These interview data underscored the necessity for clinicians to move beyond surface-level narratives to dismantle the avoidance mechanisms inherent in spiritual bypass. By validating the counselors' experiences, it becomes evident that successfully navigating these dynamics requires a high level of therapeutic neutrality and technological competence, especially within the context of hybrid counseling. The counselors emphasized that the path toward a "modern Samara family" requires the clinician to help the family move from using faith as a mechanism of avoidance toward using it as a foundation for authentic vulnerability and systemic re-functionalization. This transition allows the Divine to shift from a rigid, compensatory control mechanism to a secure, correspondence-based source of resilience, thereby enabling the family to engage more honestly with the challenges of their post-pandemic reality.

4. Conclusion

The research demonstrated that families who view the Divine as a "secure haven" are better equipped to leverage theological virtues such as faith, hope, and charity, allowing them to re-functionalize their internal structures during times of crisis. Conversely, families characterized by divine insecurity often mirror their perceived distance from the Divine through aggressive control and emotional inflexibility. By validating these constructs, this study established that spiritual attachment is not peripheral but central to family resilience, particularly in a post-pandemic landscape defined by hybrid intimacy and economic instability.

Ultimately, the study suggests family counselors must move beyond viewing religious narratives as mere coping mechanisms. Instead, they must treat the God-image as a primary therapeutic target. By addressing "spiritual bypass" and helping families transition from insecure to secure attachments, clinicians can effectively break cycles of interpersonal hostility and foster a more adaptable, cohesive family system. Future clinical practice should integrate these findings into a unified, ethically sound framework that promotes both psychological flourishing and spiritual well-being within the diverse communities of the Zamboanga Peninsula and beyond.

While this study successfully mapped the relationship between divine attachment and systemic family functioning, its scope was necessarily constrained by its exploratory design. The primary limitation resides in the purposive, small-scale sample size of 10 families from the Zamboanga Peninsula. Furthermore, the study relied on self-reported psychometric data and retrospective counselor interviews, which are susceptible to social desirability bias, particularly when participants navigate sensitive intersections of faith and familial conflict. The cross-sectional nature of the quantitative phase also prevents the establishment of definitive causal directions; while secure divine attachment correlates with high cohesion, it remains to be seen whether this is a recursive process or a unidirectional influence.

To advance the Divine Attachment Model, future research should prioritize longitudinal designs that track families over several years to observe how shifts in divine attachment precede, rather than merely coincide with, changes in family systemic health. Expanding the participant pool to include a wider range of socioeconomic strata and religious traditions would also strengthen the external validity of the model, allowing for a more nuanced understanding of how hybrid intimacy operates in purely rural versus peri-urban environments. Additionally, it is recommended that future studies integrate observational coding of family interactions during counseling sessions, rather than relying solely on self-report scales. Finally, researchers should focus on developing specific ethical protocols for digital faith-based counseling to ensure that counselors can effectively challenge "spiritual bypass" without overstepping the boundaries of therapeutic neutrality.

Statement of No Conflict of Interest

The researchers involved in this study declare that there are no financial, professional, or personal conflicts of interest that could have inappropriately influenced the representation or interpretation of the research findings. Furthermore, the findings are presented transparently to support the development of ethical, evidence-based practices in faith-based family counseling, free from any vested interests in specific theological organizations or commercial therapeutic products.

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