

Policies and guidelines for non-formal education retention in the digital age

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ABSTRACT

Centering on the Office of Non-Formal and Informal Education (ONIE) Center in Bangkok, this study examines the multifaceted drivers of student dropout within Thailand's evolving non-formal education system. Employing binary logistic regression on data collected from 428 learners, the analysis integrates demographic, familial, and psychosocial variables to identify statistically significant predictors of disengagement. Key findings reveal that exposure to violence, gender, educational attainment, and sibling-related responsibilities exert substantial influence on dropout likelihood. Specifically, learners tasked with caregiving duties or who had siblings currently enrolled in school exhibited elevated dropout risks. In contrast, those with siblings engaged in employment showed a comparatively lower propensity to disengage from education, suggesting a protective economic and emotional buffer. Notably, over 70% of participants reported prior experiences of violence—a psychosocial factor that emerged as a salient predictor, underscoring the compounded vulnerabilities faced by marginalized learners in urban settings with limited support infrastructure. The final regression model demonstrated strong sensitivity in identifying high-risk individuals and moderate explanatory power (Nagelkerke $R^2=0.211$). These results underscore the imperative for multi-level intervention strategies that address both academic and emotional constraints. By elucidating the intersecting structural and psychosocial dimensions of dropout behavior, this study offers actionable insights to inform targeted retention policies and enhance learner persistence in Thailand's non-formal education landscape.

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1. INTRODUCTION

In contexts where structural inequalities and economic constraints limit access to formal schooling, non-formal education provides a critical alternative pathway to learning and social mobility. In Thailand, this role is fulfilled primarily by the Office of Non-Formal and Informal Education (ONIE), which offers flexible programs designed for populations that are underserved or excluded from the mainstream education system. Target groups include out-of-school youth, working adolescents, and adults seeking to complete basic education while balancing work and family obligations [1].

The ONIE system is deliberately adaptive. It incorporates modular curricula, mobile learning units, vocational training, and community-based classes to meet diverse learner needs. Despite these strengths,

persistent dropout rates remain a pressing concern, threatening to undermine the effectiveness of Thailand's inclusive education policies. The challenge is particularly acute in urban and peri-urban districts, where rapid demographic change and socioeconomic heterogeneity create both opportunities and pressures that affect educational participation.

Existing research on school dropout in Thailand identifies a range of contributing factors. At the household level, economic hardship, parental education, and the need for children to contribute to family income have been found to significantly increase the likelihood of leaving school prematurely. In rural settings, insufficient academic support, long travel distances to learning centers, and competing agricultural labor demands also contribute to attrition. At the individual level, poor academic performance and low engagement with learning activities are consistent predictors of dropout risk.

International studies further illuminate the role of psychosocial stressors in shaping educational outcomes. Exposure to violence, family instability, and caregiving responsibilities—particularly among female learners—have been shown to elevate dropout risk in both formal and non-formal systems [2], [3]. However, these global findings are often generalized and may not fully capture the localized realities of Thailand's non-formal education landscape, where learner profiles and community contexts can differ substantially from those in other regions.

The Center of Bangkok provides a compelling case study through which to examine these dynamics. As an area experiencing rapid urbanization, population mobility, and cultural diversity, Bangkok's ONIE centers serve learners from a wide spectrum of socioeconomic backgrounds. Preliminary accounts from local educators and administrators indicate that dropout behavior may be driven by an interplay of demographic characteristics (e.g., gender, age, sibling composition), family conditions (e.g., household responsibilities, parental support, and economic stability), and psychosocial factors (e.g., exposure to community violence, peer influence). Yet, despite the availability of anecdotal evidence, there has been little systematic research quantifying the combined effects of these variables on dropout likelihood in this specific context.

Although previous studies have explored the determinants of dropout in both formal and non-formal education—highlighting factors such as family instability, psychosocial adversity, gendered inequalities, and systemic challenges [3]–[6], the literature remains fragmented in two important ways. First, most analyses examine these dimensions in isolation rather than investigating how structural, demographic, familial, and institutional factors interact to shape dropout trajectories. Second, the existing evidence base for Thailand's non-formal education sector, particularly under the office of the ONIE, remains limited and predominantly descriptive, offering few empirical models capable of predicting dropout risk with statistical rigor. Furthermore, while policy recommendations often emphasize inclusivity and learner support, they lack actionable, data-driven specificity tailored to high-risk subgroups in peri-urban contexts such as Min Buri.

In this research, non-formal education refers to organized out-of-school learning activities, which are provided out of the formal school system but that are designed and implemented to meet particular groups of learners' need such as out-school youth and marginalized individuals [3], [7]. In Thailand, the role is conducted by the office of ONIE in offering a flexible and community-based education [1], [8]. Psychosocial risk is a term that refers to social and psychological conditions which expose individuals to negative educational outcomes, such as exposure to violence, family instability and emotional distress. Such risks are closely related to low academic engagement and high probability of dropout, especially for students from disadvantaged backgrounds [8].

2. THE COMPREHENSIVE THEORETICAL

The term dropout is commonly used to describe young people who fail to complete their elementary or secondary (middle/high) education, often withdrawing from school for various reasons [9], [10]. The dropout phenomenon has become a critical social issue because of its far-reaching negative consequences, which can undermine not only the quality of life of individuals but also the well-being of their families and the broader society. Although school dropout is not a new problem, its enduring consequences—such as insufficient educational qualifications for employment, difficulties with social adaptation, wasted educational resources, and reduced economic contributions to society—remain pressing concerns [11]. Governments at all levels, along with educational stakeholders, have consistently sought to address this challenge. Nevertheless, these efforts have often fallen short, thereby rendering the goal of education for sustainable development difficult to achieve [12]. In Thailand, for example, the government has introduced several policies and initiatives aimed at reducing dropout rates, such as the “leave no one behind” campaign and the Phan Nong Klap Ma Rian (“bringing children back to school”) program, which seek to promote equity, inclusivity, and expanded educational opportunities.

Thailand's non-formal education sector, administered by the office of the ONIE, occupies a critical space within the country's educational architecture. It offers second-chance pathways to learners traditionally marginalized by the formal system—low-income youth, migrant populations, and out-of-school adolescents.

Yet, as digitalization and urban transformation reshape the broader social fabric, this sector remains acutely vulnerable to high attrition. Nowhere is this more visible than in peri-urban districts such as Min Buri, where systemic inequality, demographic flux, and infrastructural insufficiency converge. This review synthesizes emerging evidence across four interlinked domains—structural conditions, demographic correlates, familial and psychosocial stressors, and institutional limitations—to develop a comprehensive understanding of the dropout phenomenon in ONIE contexts.

2.1. Structural and societal context of non-formal education in Thailand

The ONIE framework was established as a corrective mechanism for educational exclusion, targeting those for whom mainstream schooling is inaccessible due to economic hardship, geographic isolation, or social displacement [4]. Its offerings—ranging from basic literacy to vocational training—are designed with flexibility in mind. However, structural deficiencies have constrained the system's transformative potential. In districts like Min Buri, rapid urbanization has outpaced social infrastructure, yielding a fragmented educational geography marked by weak transportation networks, inconsistent institutional presence, and insufficient learner follow-up [5]. These deficits are compounded by limited state capacity and uneven resource allocation, creating localized 'pockets of exclusion' where dropout becomes normalized rather than exceptional.

2.2. Demographic factors associated with dropout behavior

Demographic profiles exert a non-trivial influence on retention patterns within ONIE programs. Gender remains a salient determinant. While female learners tend to demonstrate stronger academic commitment and resilience, male learners are often pulled into informal labor markets or peer-led subcultures that devalue education [5], [13], [14]. Household composition further mediates dropout probability. Large family size has been associated with diminished per-capita investment in education, reducing access to learning materials, emotional scaffolding, and parental oversight. Moreover, prior educational attainment serves both as an asset and a liability. Students with weak foundational competencies may struggle with ONIE curricula, while those who perceive non-formal education as academically inferior may disengage due to diminished future utility [15]. This dual burden is particularly acute in heterogeneously composed ONIE classrooms, where learners with divergent academic histories are grouped without sufficient pedagogical differentiation.

Research indicates that student dropout in higher education is shaped by demographic, academic, and economic factors, including gender, age, nationality, type of study, academic performance, financial support, and employment status [16]–[19]. Nevertheless, evidence remains inconsistent regarding gender and age: some studies report higher dropout among women, while others suggest men are more vulnerable, and findings on age vary across contexts. Similarly, the impact of scholarships and financial aid is inconclusive, although some research highlights age as a particularly influential factor [20], [21]. In contrast, employment status is consistently identified as a strong predictor, with working students showing a significantly higher likelihood of withdrawing from university [22]–[24].

2.3. Family structure and psychosocial vulnerability

Family dynamics serve as both protective and risk factors in shaping educational trajectories. The absence of parental figures—due to migration, divorce, or economic precarity—has consistently been linked to lower learner persistence. Unstable households often fail to cultivate the motivational ecosystem necessary for sustained academic engagement, particularly when children are expected to assume caregiving or income-generating responsibilities [4]. These demands frequently intersect with psychosocial vulnerabilities, including exposure to domestic violence, bullying, or untreated trauma. In the ONIE context, such vulnerabilities are rarely identified or addressed in a timely manner, largely due to the near-total absence of mental health services or trauma-informed educational practices. Nicaise *et al.* [5] note that the cumulative burden of emotional neglect and structural deprivation often precipitates early withdrawal from education.

Family structure has been increasingly recognized as a significant factor influencing school dropout. Recent studies indicate that adolescents from non-intact families—such as single-parent, stepfamilies, or households with multiple siblings—are more vulnerable to academic disengagement due to reduced economic resources, diminished parental support, and increased exposure to family conflict [25], [26]. Research consistently highlights that divorce, separation, and unstable family environments negatively affect students' psychological well-being and academic persistence, thereby elevating dropout risks [27], [28]. Moreover, financial strain within disrupted families often limits the ability to provide necessary educational resources, compounding the likelihood of withdrawal from school [7], [29]. Conversely, strong and stable family structures are associated with greater resilience, stronger academic support, and lower dropout rates.

These findings suggest that family structure remains a robust predictor of dropout in contemporary educational contexts.

Mental health is a significant predictor of adolescents' risk of school dropout. The World Health Organization (WHO) defines mental health as a state of well-being in which individuals realize their abilities while coping with normal life stresses. Evidence shows that mental health affects school completion and educational attainment, both directly and indirectly [30], [31]. Poor mental health among adolescents—including depression, addiction, and trauma—has been linked to higher dropout rates [31], [32]. Adolescence, as a complex developmental stage, often involves experimentation and risk-taking, which can increase susceptibility to substance abuse and other behaviors indicative of poor mental health, further elevating dropout risk [33], [34]. Studies indicate that students with lower educational attainment are more vulnerable to mental health disorders, and untreated mental health issues can lead to reduced academic achievement and long-term negative outcomes such as unemployment, risky behaviors, and criminality [31], [32].

2.4. Institutional and teacher-related constraints

Despite ONIE's decentralized mandate and community-based philosophy, systemic weaknesses persist in monitoring, adaptation, and learner support. Many centers lack proactive dropout tracking mechanisms, limiting the possibility of early intervention. Curricula, while modular in design, remain overly standardized and are frequently misaligned with the lived realities and aspirations of learners, especially those who have experienced educational disruption or psychological hardship [15]. Compounding this is the pedagogical preparedness of educators. Facilitators are often undertrained in differentiated instruction and ill-equipped to handle the complex academic and psychosocial profiles of their learners. This institutional inertia contributes to an alienating learning environment, reinforcing a cycle of disconnection and attrition.

Several studies highlight that participatory approaches in education hold strong potential for addressing the risks of school dropout. However, the existing literature lacks a clearly defined or structured framework. For instance, research has shown that school principals often develop curricula in collaboration with parents, communities, and other stakeholders to ensure that educational programs are contextually relevant and responsive to local needs [10], [13]. In addition, teachers can actively encourage parental involvement in the learning process, which fosters a greater sense of ownership and motivation to support children's continued schooling. These efforts are further reinforced through cross-sectoral collaboration, where schools partner with government bodies, private institutions, and local communities to create learning environments that align with the economic and social realities of the community [35].

2.5. Bronfenbrenner's ecological systems theory

Bronfenbrenner's ecological systems theory posits that human development is the consequence of complex interchange between the individual and multiple, interconnected environmental systems [36], [37]. These are the microsystem (family, teachers, and peers), mesosystem (relationships between home and school), exosystem (community contexts that indirectly affect the child such as structures of constraint or gain in the institutions/policies of government), macrosystem (including economic structure, state policies and social norms) and chronosystem (time-related transitions). Considering Thailand's non-formal education system, the framework further highlights psychosocial vulnerability as a compounded consequence of various pressures at different levels—poverty, family violence, care-giving responsibilities for siblings, no emotionally safe schooling environment, and social stigma. These are factors that arise at the microsystem level, but are reinforced and exaggerated through mesosystem interactions – poor communication between families and learning settings or lack of effective individualized systems of support.

Meanwhile, centralized control mechanisms, inflexible policies and lack of resources in the exosystem as well as macrosystem layers exacerbate forces exerted on at-risk students to not deal with psychosocial problems in a prompt manner. In combination with major events at the chronosystem level such as family loss or economic hardship, these vulnerabilities magnify and contribute to disengagement from school. Thus, use of ecological systems framework in the current study suggests that dropout is not simply due to declining individual motivation but is an expression of psychosocial vulnerability generated and perpetuated through multilevel structures. Any effective intervention must therefore also work at a systemic level, offering safe spaces, adequate psychosocial support and meaningful policy shifts that attend to the everyday realities of students lives [37].

3. METHOD

This study adopted a quantitative research design to systematically examine the factors contributing to dropout behavior among learners enrolled at the ONIE center in Bangkok's Min Buri district. Quantitative inquiry was selected for its capacity to yield generalizable insights through the statistical interrogation of

empirical data, enabling the identification of salient predictors and structural patterns associated with educational disengagement in non-formal contexts.

3.1. Questionnaire design and instrument validation

To align with the study's objectives and uphold methodological precision, a structured questionnaire was developed as the principal data collection instrument. The tool was tailored to the sociocultural specificities of ONIE learners in Min Buri and was designed to interrogate multiple dimensions of dropout risk—including personal, familial, institutional, and societal factors—through both closed and open-ended items. The instrument was divided into three core sections. The first captured respondent demographics and enrollment-related information, including gender, age, household composition, number of siblings, learner status (basic, continuing, or informal education), and initial motivations for ONIE participation. The second section comprised 43 items measuring perceived dropout drivers on a 5-point Likert scale (ranging from least contributing to most contributing), structured across four domains: personal barriers, familial burdens, social environment, and institutional inadequacies. The final section invited respondents to suggest remedial strategies, support mechanisms, and pedagogical improvements through open-ended responses, ensuring that learner perspectives could be directly incorporated into policy-relevant interpretations.

Item construction drew upon an extensive review of prior empirical research and theoretical frameworks concerning educational marginalization and institutional fragility in non-formal learning environments. Cultural adaptation and content validity were achieved through a collaborative review process with domain experts, who evaluated items for clarity, relevance, and contextual appropriateness. Pilot testing was conducted with a subsample of 30 ONIE learners to refine instrument phrasing, assess internal coherence, and minimize ambiguity. Based on respondent feedback, several revisions were enacted: redundant items were eliminated, technical jargon was simplified, and question sequencing was optimized for cognitive flow. Internal consistency reliability, as measured by Cronbach's alpha, yielded a coefficient of 0.896—indicating a high degree of internal cohesion and suggesting minimal measurement error [38], [39].

3.2. Sample selection

To ensure robust representation and statistical reliability, this study employed a mixed sampling approach. The target population consisted of all currently enrolled learners at the ONIE Min Buri district center across the full spectrum of non-formal education programs. A minimum sample size of 384 was computed using Cochran's formula, assuming a 95% confidence level and 0.05 margin of error. The final dataset included 428 valid responses to strengthen statistical power and offset potential attrition.

While systematic sampling ensured proportional representation, purposive sampling was employed to capture demographic heterogeneity within ONIE's learner base. This was deemed appropriate given the fluid and context-sensitive nature of non-formal education. Selection criteria included enrollment status and willingness to participate, and efforts were made to include participants across gender, age groups, academic level, and duration of enrollment. The rationale for this sampling strategy lies in the distinct composition of non-formal education populations, which tend to be more diverse and less institutionally anchored than their formal counterparts. By grounding the study in the lived experiences of current learners, the findings maintain both empirical validity and practical relevance for targeted policy design and intervention planning.

3.3. Data collection

Data were collected during the first academic semester of 2025 at the ONIE Min Buri Center through the in-person distribution of printed questionnaires. This approach was chosen to maximize participation among learners who may face technological or digital access barriers, and to ensure direct engagement with the study's target demographic. Prior to data collection, ONIE staff and facilitators received training on ethical protocols, research objectives, and respondent rights. Questionnaires were distributed during scheduled instructional sessions, and learners were provided with both oral and written instructions. Ample time was allotted for completion, and staff were available to clarify ambiguities where needed—ensuring accessibility across varying levels of literacy and educational attainment.

Upon return, completed instruments were reviewed for completeness, internal coherence, and alignment with inclusion criteria. Invalid or incomplete responses were excluded, resulting in a final analytic sample of 428 fully completed questionnaires. Data collection adhered strictly to ethical norms. Participation was voluntary, responses were anonymous, and no personal identifiers were recorded. No incentives were offered, and respondents retained the right to withdraw at any stage. In line with the Thailand Science Research and Innovation (TSRI) guidelines—specifically Guidance No. 3(3)—this study qualified for exemption from formal ethical review, as it involved non-invasive, anonymous data collection without medical risk or personally identifiable data [38]. Nonetheless, all procedures reflected a firm commitment to ethical rigor and participant dignity.

3.4. Data analysis

The factors associated with dropout behavior among learners at the ONIE Min Buri Center were analyzed using descriptive and inferential statistical techniques. All analyses were conducted using Jamovi software (version 2.16.17.0). Descriptive statistics, including frequencies, percentages, means, and standard deviations, were first employed to summarize respondents' demographic characteristics, family structure, and psychosocial conditions. Pearson correlation analysis was subsequently applied at the exploratory stage to examine bivariate associations among key independent variables and to assess potential multicollinearity. These correlation analyses were conducted solely for preliminary inspection and were not used for hypothesis testing.

The primary inferential analysis employed binary logistic regression, as the dependent variable—dropout behavior—was dichotomous (1=dropout risk, 0=retention). Logistic regression was selected due to its suitability for estimating the probability of a binary outcome based on multiple predictors and its robustness when the outcome variable does not follow a normal distribution. Demographic variables, including gender and educational attainment, along with family-related factors such as birth order, number of siblings not yet enrolled in school, number of siblings currently enrolled in school, and number of siblings currently employed, were entered as independent variables in the model. Model adequacy was assessed using the Omnibus test of model coefficients, Cox & Snell R^2 , and Nagelkerke R^2 . The Wald statistic and associated p-values were used to evaluate the statistical significance of individual predictors. Results were interpreted using odds ratios (ORs) derived from the exponentiated regression coefficients ($\text{Exp}(B)$). Model classification accuracy was assessed using a cutoff value of 0.50 to evaluate the predictive performance of the logistic regression model.

4. RESULTS

Data collected through paper-based questionnaires administered at the ONIE Min Buri Center served as the foundational dataset for a comprehensive analysis of respondents' demographic profiles and educational histories. This preliminary examination was instrumental in contextualizing the broader study findings, facilitating a nuanced understanding of the multifactorial causes of student dropout, and informing the development of targeted intervention strategies within Thailand's non-formal education system. Table 1 presents a detailed overview of the demographic characteristics and familial backgrounds of the 428 students who participated in the study. The gender distribution was nearly balanced, with females constituting 50.9% and males 49.1% of the sample, reflecting equitable representation across genders. Academic attainment among respondents revealed a bifurcated pattern: the majority had completed either junior high school (47.7%) or high school (47.4%), while smaller proportions had only primary education (3.3%) or were engaged in informal education programs (1.6%). This distribution underscores the heterogeneous academic profiles of learners within Thailand's non-formal education system.

Family composition varied notably with respect to sibling count. Although a minority reported no siblings (9.1%) or a single sibling (9.3%), the predominant family structures included two (38.3%) or three (25.0%) siblings, indicating a tendency toward moderate family size. Birth order data further corroborated this pattern, with over half of respondents identifying as first-born (50.7%), followed by second-born (29.0%) and third-born (13.6%) positions. Families with four or more children constituted a marginal subset.

Regarding sibling educational engagement, an overwhelming majority (90.9%) reported that none of their siblings were out of school, suggesting widespread school attendance within these households. Nonetheless, educational responsibilities appeared to be shared across siblings, with 46.7% indicating one sibling currently enrolled in school and 23.4% reporting two siblings engaged academically. Labor participation among siblings displayed nuanced patterns: 37.9% of respondents reported no working siblings, while 35.3% and 16.8% reported one and two working siblings respectively, with a small fraction acknowledging three or more. These data illuminate the intersection of educational and economic roles within family units.

Crucially, when queried about experiences of violence, 71.5% of respondents disclosed exposure to significant levels of violence, while 28.5% reported minimal or no such experiences. This finding signals the presence of psychosocial vulnerabilities that may adversely influence student persistence and engagement. Collectively, these descriptive statistics offer a comprehensive portrait of the socio-familial and demographic context of ONIE learners. This foundation is vital for subsequent analyses aimed at elucidating dropout risk factors and devising evidence-informed strategies to bolster educational retention within Thailand's non-formal education framework.

Table 1. General demographic and digital behavior characteristics

General information		Frequency	Percentage (%)
Gender	Male	210	49.1
	Female	218	50.9
Education	Primary education	14	3.3
	Junior high school	204	47.7
	High school	203	47.4
	Informal education	7	1.6
Number of siblings (persons)	None	39	9.1
	One	40	9.3
	Two	164	38.3
	Three	107	25.0
	Four	46	10.7
	Five	18	4.2
	Six	7	1.6
	Seven	2	0.5
	Nine	4	0.9
	Ten	1	0.2
Birth order of the respondent	First	217	50.7
	Second	124	29.0
	Third	58	13.6
	Fourth	18	4.2
	Fifth	6	1.4
	Sixth	1	0.2
	Seventh	4	0.9
Number of siblings not yet in school	None	389	90.9
	One	31	7.2
	Two	7	1.6
	Five	1	0.2
Number of siblings currently enrolled in school	None	90	21.0
	One	200	46.7
	Two	100	23.4
	Three	25	5.8
	Four	10	2.3
Number of siblings currently employed	None	162	37.9
	One	151	35.3
	Two	72	16.8
	Three	25	5.8
	Four	12	2.8
	Five	2	0.5
Experienced violence	Yes	306	71.5
	No	122	28.5
Total		428	100.0

Table 2 provides an analytical overview of student perceptions concerning individual-level factors contributing to dropout behavior. The extent of consensus among respondents was evaluated using mean scores and standard deviations, revealing that, overall, these personal factors were perceived as moderately influential in dropout decisions, as indicated by relatively low mean values across most items. Among the factors assessed, “work to support family” yielded the highest mean score ($M=2.49$, $SD=1.481$), underscoring the salient role of household responsibilities and economic necessity as primary individual drivers of educational disengagement. This finding corroborates prior research linking financial strain with discontinuities in non-formal education participation.

Additionally, “lack of study funds” ($M=2.07$, $SD=1.264$) and “average academic performance below criteria” ($M=2.06$, $SD=1.289$) emerged as noteworthy challenges, reflecting the intersection of economic constraints and academic difficulties faced by learners. These results suggest that both insufficient financial resources and academic underachievement may precipitate dropout risk. Conversely, factors such as “gambling” ($M=1.30$, $SD=0.854$), “drug use” ($M=1.37$, $SD=0.948$), and “early family formation or pregnancy” ($M=1.51$, $SD=1.094$) were assigned notably lower mean scores, indicating minimal perceived impact on dropout decisions. Similarly, social and emotional variables—including “Being teased or insulted” ($M=1.52$), “Lack of friends to consult” ($M=1.69$), and “feeling compelled in choice of study field” ($M=1.63$)—received relatively low ratings, suggesting limited prevalence or influence within this cohort.

Table 2. Causes of dropout problems in terms of students

Causes of dropout problems in terms of students	Mean	Std. Deviation
Lack of study funds	2.07	1.264
Social isolation	1.73	1.120
No academic peer support	1.69	1.057
Poor peer communication	1.75	1.266
Work to support family	2.49	1.481
Excessive absenteeism	1.82	1.345
Low activity participation	1.95	1.252
Below-average grades	2.06	1.289
Chronic illness	1.61	1.108
Mismatch with interests	1.89	1.219
Forced field of study	1.63	1.140
Peer distraction	1.86	1.277
Romantic/family issues	1.51	1.094
Gambling	1.30	0.854
Drug use	1.37	0.948
Bullying/discrimination	1.52	1.070
Attention/learning problems	1.53	1.013

Standard deviations predominantly ranged between 1.0 and 1.4, signaling moderate heterogeneity in respondent perceptions, likely reflective of diverse individual circumstances. Collectively, the data articulate a nuanced profile in which economic and academic pressures are identified as principal barriers, whereas peer dynamics, emotional distress, and personal misconduct are generally deemed less consequential. These findings emphasize the imperative for targeted interventions that prioritize academic support and financial aid as key strategies to mitigate dropout risk. Moreover, they offer critical insight into the lived experiences of students navigating the complexities of Thailand's non-formal education system.

Table 3 presents an evaluative summary of student perceptions regarding the influence of neighborhood and familial factors on dropout behavior. Through the application of mean scores and standard deviations, the analysis elucidates the relative weight attributed to various environmental and family-related challenges in shaping students' decisions to disengage from education.

Table 3. Cause of the outdoor issue in the community family

Cause of the outdoor issue in the community family	Mean	Std. Deviation
Ongoing tension with family members	1.71	1.107
Emotionally unprepared for parenting role	1.92	1.272
Lack of financial accountability for school expenses	1.88	1.247
Deficient family bonding and care	1.69	1.091
Discipline involving physical or emotional harm	1.56	1.073
Disrupted family structure due to separation	2.06	1.495
Parents show little interest in education	1.45	0.970
Guardians do not prioritize academic development	1.43	0.995
Home environment lacks stable residency	1.46	0.985
Too many children in school; limited financial resources	1.63	1.185
Nearby exposure to harmful influences	1.48	0.964

Among the factors assessed, "the family is divided/parents divorce" attained the highest mean score (M=2.06, SD=1.495), underscoring parental separation and household instability as primary family-related determinants of dropout risk. This finding aligns with extant literature highlighting the disruptive impact of family dissolution on student mental well-being and academic continuity. Additional items with moderately elevated mean values included "lack of a responsible person to pay for the study" (M=1.88, SD=1.247) and "emotionally unprepared for parenting role" (M=1.92, SD=1.272), reflecting economic precarity and role ambiguity frequently encountered by youths in low-income or informal educational contexts.

Conversely, items such as "sources of vices near the school" (M=1.48, SD=0.964), "the family has a place that is not a residence" (M=1.46, SD=0.985), and "parents/guardians do not give importance to education" (M=1.43 and 1.45, SD≈0.97–0.99) were assigned comparatively low scores. These results suggest that while such structural and attitudinal factors may be present, they are generally not perceived by students as primary drivers of dropout. Similarly, affective and relational dimensions—such as "lack of love and warmth from the family" (M=1.69), "ongoing tension with family members" (M=1.71), and "strictness or violent punishment from parents" (M=1.56)—received moderate ratings. This pattern indicates heterogeneity in family experiences but suggests a relatively diminished overall influence on dropout decisions within this sample.

Standard deviations predominantly ranging from 1.0 to 1.5 indicate moderate variability in student responses, likely reflective of diverse personal and domestic contexts. Taken collectively, the data emphasize the pivotal role of stable family structures and financial support in fostering educational persistence. The lower mean ratings for other community and structural challenges imply that, from the learners' perspectives, internal family dynamics—especially divorce and economic instability—are more consequential to dropout risk than broader neighborhood conditions.

Table 4 presents an analysis of student perceptions concerning the influence of instructional and institutional factors on dropout behavior, with particular attention to the role of educators and educational establishments. The impact of these school-related challenges on students' decisions to discontinue their education was quantified through mean scores and standard deviations. Among the institutional factors, the item “the rules and regulations of the school are too strict” recorded the highest mean score ($M=1.78$, $SD=1.211$), indicating that stringent institutional policies may act as a moderate barrier to sustained engagement, especially for learners seeking greater autonomy. Despite this relatively elevated rating, the overall influence of this factor on dropout decisions remains modest.

Table 4. Cause of the outdoor issue in the teacher/school teacher

Cause of the outdoor issue in the teacher/school teacher	Mean	Std. Deviation
Rigid disciplinary environment impacts engagement	1.78	1.211
Lack of up-to-date teaching aids and technology	1.5	0.945
Deficient supplementary learning resources	1.57	0.981
Minimal personalized attention to student needs	1.58	1.061
Limited intervention systems for at-risk students	1.58	1.013
Lack of proactive outreach or parental involvement	1.56	1.035
Inaccessible or inappropriate academic content	1.61	1.013
Poor teacher–student interaction	1.67	1.081
Student voices are not acknowledged or valued	1.71	1.112
Teachers lack effective instructional methods	1.49	0.976
Teaching does not align with curriculum goals	1.42	0.888
Poorly structured class schedules; long idle gaps	1.43	0.883
School location is distant or hard to access	1.45	0.882

Additional factors with moderately higher mean values included “listening to students' opinions” ($M=1.71$, $SD=1.112$) and “the interaction between teachers and students is not smooth” ($M=1.67$, $SD=1.081$). These findings suggest that communication deficits and limited participatory teaching approaches may subtly undermine student engagement and retention. Conversely, the majority of other institutional barriers were assigned lower mean scores. For example, “teachers' instruction does not correspond to the curriculum” ($M=1.42$, $SD=0.888$), “inappropriate scheduling or excessive free periods” ($M=1.43$, $SD=0.883$), and “educational institutions are far away or inconvenient to travel to” ($M=1.45$, $SD=0.882$) were not widely perceived as significant contributors to dropout.

Likewise, logistical and resource constraints such as “no follow-up or home visits” ($M=1.56$), “insufficient research materials such as books and computers” ($M=1.57$), and “lack of up-to-date teaching aids and technology” ($M=1.50$) received relatively low concern. These results indicate that material deficiencies and infrastructural limitations were not primary factors undermining learner persistence within the sample. Standard deviations predominantly ranged from 0.88 to 1.21, reflecting considerable heterogeneity in student perceptions, potentially attributable to varied learning contexts and teaching experiences. Collectively, the data suggest that while institutional and pedagogical factors are perceived as relatively minor drivers of dropout in non-formal education, components such as rigid regulations, suboptimal teacher-student interactions, and insufficient responsiveness to student feedback warrant attention within comprehensive retention strategies.

Table 5 delineates the prevalence of violence exposure among the 428 study participants, revealing a strikingly high incidence. Only 28.5% ($n=122$) of respondents reported no or minimal experience with violence, whereas a substantial majority (71.5%, $n=306$) indicated exposure to high levels of violence. These findings underscore the profound psychosocial challenges faced by learners within Thailand's non-formal education system and the potential detrimental impact of violence on educational engagement and retention. The pronounced prevalence of violence suggests that a significant proportion of students endure adverse experiences that may compromise mental health, safety perceptions, and academic persistence. This is particularly salient in the context of non-formal education, where learners often hail from socioeconomically disadvantaged or vulnerable backgrounds.

Table 5. Frequency and percentage of experience violence

Experienced violence	Frequency	Percentage (%)
Yes	306	71.5
No	122	28.5
Total	428	100.0

This empirical insight provides a critical foundation for more nuanced inquiries into how violence—whether occurring within familial, community, or educational environments—intersects with other dropout-related factors such as economic hardship and inadequate institutional support. The implications for educational policy are substantial, highlighting an urgent need to enhance learner protection mechanisms, expand access to counseling services, and incorporate trauma-informed pedagogical approaches. Subsequent analyses focused specifically on the subset of 306 respondents reporting high exposure to violence, facilitating a deeper exploration of the complex interplay between violent experiences and other familial, institutional, and individual determinants of educational discontinuity.

Table 6 presents the descriptive statistics for a key variable measured across the 428 study participants. The mean score was 71.58, accompanied by a notably high standard deviation of 27.27, indicating substantial variability within the sample. This pronounced dispersion reflects considerable heterogeneity among respondents, with some exhibiting relatively low scores while others demonstrated markedly higher levels on the measured construct.

Such variability likely stems from diverse individual backgrounds, lived experiences, and contextual factors influencing responses. The observed range underscores the imperative of accounting for these individual differences in subsequent analyses and interpretations. This is particularly relevant when identifying patterns or predictors related to dropout behavior within Thailand's non-formal education sector, where learner diversity is a defining characteristic.

Table 6. Mean and standard of experienced violence

N	Mean	Std. Deviation
428	71.5771	27.2680

Table 7 presents the results of the Omnibus test of model coefficients, assessing the overall statistical significance of the logistic regression model in predicting dropout outcomes within the non-formal education system. The model, with seven degrees of freedom, yielded a chi-square statistic of 68.110 and a corresponding p-value of <0.001 , indicating robust significance at the conventional 0.05 threshold. This result confirms that the inclusion of the selected independent variables—spanning institutional, familial, and individual domains—substantially improves predictive accuracy compared to a null model devoid of predictors. In essence, the integrated model offers a significantly enhanced explanatory framework for dropout behavior. The statistically significant omnibus test validates further examination of individual regression coefficients by demonstrating that the model captures meaningful variance in dropout status beyond random fluctuation, reinforcing its empirical and theoretical relevance.

Table 8 details the logistic regression model summary statistics, providing insight into the model's explanatory power in predicting dropout behavior among students enrolled in non-formal education. The model's goodness-of-fit is reflected by a -2 Log Likelihood value of 443.484, where lower values indicate an improved fit relative to a null model lacking predictors. Two pseudo R-squared measures are reported to contextualize explained variance: Nagelkerke's R^2 at 0.211 and Cox & Snell's R^2 at 0.147. Nagelkerke's adjustment facilitates interpretability by scaling the statistic to range between 0 and 1, whereas Cox & Snell's value offers a more conservative estimate of the variance accounted for by the model.

Collectively, the independent variables explain approximately 21.1% of the variance in dropout behavior, underscoring the model's meaningful, albeit modest, explanatory capacity. The effect size, while limited, confirms the model's suitability for evaluating the relative influence of predictors on dropout likelihood. Moreover, the logistic regression estimation process demonstrated reliable convergence after six iterations, with parameter changes falling below 0.001, further affirming the robustness of the model fitting.

Table 7. Omnibus test

Step	Test	Chi-square	df	Sig.
Step 1	Step	68.110	7	0.000
	Block	68.110	7	0.000
	Model	68.110	7	0.000

Table 8. The model summary

Step	-2 log likelihood	Cox & Snell R square	Nagelkerke R square
1	443.484 ^a	0.147	0.211

a. Estimation terminated at iteration number 6 because parameter estimates changed by less than .001.

Table 9 presents the classification results of the logistic regression model, evaluating its efficacy in predicting respondents' exposure to high levels of violence. Utilizing a threshold probability of 0.50 to dichotomize cases into "Yes" (high exposure) and "No" (low or no exposure) categories, the classification matrix contrasts observed outcomes with model predictions. The model demonstrated an overall accuracy of 78.3%, correctly identifying 96.7% of respondents reporting high violence exposure and 32.0% of those reporting low or no exposure. This performance indicates a strong sensitivity in detecting individuals at elevated risk for violence, though specificity in classifying the "No" group is comparatively limited.

The reduced specificity may reflect overlapping predictor profiles between exposure groups or an inherent model bias favoring the identification of high-risk cases. Nonetheless, the heightened sensitivity underscores the model's utility in reliably flagging vulnerable individuals within non-formal educational settings. Despite the lower classification accuracy for the "No" exposure group, the model's predictive capacity aligns with expectations in behavioral and social science research contexts. These findings substantiate the model's potential as an effective tool for early identification of youth at risk of violence, thereby informing targeted intervention strategies beyond traditional educational environments.

Table 9. Classification table for back-testing

	Observed	Predicted		Percentage correct (%)
		Experienced violence	Percentage correct (%)	
Step 1	Experienced violence	Yes	No	96.7
		Overall percentage	Yes	296
	No	83	39	78.3

Note: the cut-off value is 0.500.

Table 10 presents the results of a logistic regression analysis identifying both statistically significant and non-significant predictors of high violence exposure among students enrolled in Thailand's non-formal education system. Several variables achieved statistical significance at the 0.05 level, highlighting their relevance in explaining variations in students' experiences of violence. Gender emerged as a significant predictor ($B=-0.877$, $p<0.001$, $\text{Exp}(B)=0.416$), indicating that male students (coded as 1, with females as the reference group) were significantly less likely to report high levels of violence exposure. This finding may reflect gendered differences in vulnerability, coping mechanisms, or reporting behavior. Educational attainment also demonstrated a significant negative association with violence exposure ($B=-0.620$, $p=0.003$, $\text{Exp}(B)=0.538$), suggesting that higher education levels may confer protective benefits, possibly through greater social awareness, resilience, or access to external support systems.

Table 10. Variables in the model

Step	Variables	B	S.E.	Wald	df	P.	Exp(B)
Step 1a	Gender	-0.877	0.243	13.02	1	0.0	0.416
	Education	-0.62	0.207	8.927	1	0.003	0.538
	Number of siblings (persons)	-0.13	0.179	0.528	1	0.467	0.878
	Birth order of the respondent	0.887	0.199	19.938	1	0.0	2.428
	Number of siblings not yet in school	0.707	0.313	5.094	1	0.024	2.028
	Number of siblings currently enrolled in school	0.383	0.19	4.08	1	0.043	1.467
	Number of siblings currently employed	-0.428	0.205	4.352	1	0.037	0.652
	Constant	-0.485	0.557	0.758	1	0.384	0.616

Note: variables with p-values below 0.05 are accepted as significant predictors (accept), while those with p-values above 0.05 are not statistically significant (reject).

a: variables entered in Step 1.

Several family structure variables further illuminated patterns of risk. Birth order was strongly associated with violence exposure, with later-born children significantly more likely to report such experiences ($B=0.887$, $p<0.001$, $\text{Exp}(B)=2.428$). This may reflect dynamics of domestic neglect, reduced parental attention, or increased intra-household conflict. Similarly, having siblings not yet enrolled in school

($B=0.707$, $p=0.024$, $\text{Exp}(B)=2.028$) and siblings currently enrolled ($B=0.383$, $p=0.043$, $\text{Exp}(B)=1.467$) both increased the likelihood of violence exposure. These associations could indicate heightened household stress, resource competition, or tensions linked to educational expectations and responsibilities. In contrast, the presence of working siblings was associated with a lower probability of experiencing violence ($B=-0.428$, $p=0.037$, $\text{Exp}(B)=0.652$), possibly due to increased household income or the redistribution of caregiving duties, which may reduce stress and conflict within the family. Notably, the total number of siblings did not significantly predict violence exposure ($B=-0.130$, $p=0.467$, $\text{Exp}(B)=0.878$), suggesting that sibling roles and developmental stages—rather than the overall count—are more pertinent in shaping risk.

The ORs and 95% confidence intervals (CIs) for all significant predictor variables from the logistic regression model are presented in Figure 1. Variables are read left of the reference line ($\text{OR}=1.0$) as protective factors decreasing the chances of dropping out, and right as risk factors increasing the odds of dropping out. The model suggests male gender ($\text{OR}=0.416$), higher education attainment ($\text{OR}=0.538$) and number of siblings currently employed ($\text{OR}=0.652$) as protective determinants. On the contrary, birth order of the respondent ($\text{OR}=2.428$), number of siblings not yet in school ($\text{OR}=2.028$), and number of siblings currently enrolled in school ($\text{OR}=1.467$) appear as risk factors that significantly increase likelihood of dropout. The non-overlapping CIs with the null effect line ($\text{OR}=1.0$) indicate that all presented predictors are statistically significant at $p<0.05$ level. This visualization highlights the divergent effect among sibling dimensions in predicting dropout risk, which is one of this study's major contributions. Employed siblings may contribute to economic and emotional support, although school-enrolled siblings may exacerbate resource competition and caregiving responsibilities in households. Taken together, these findings underscore the complex interplay between demographic characteristics and family dynamics in shaping learners' vulnerability to violence. They point to the need for nuanced, context-sensitive interventions that consider both individual attributes and familial configurations to promote safer, more supportive learning environments for non-formal education participants.

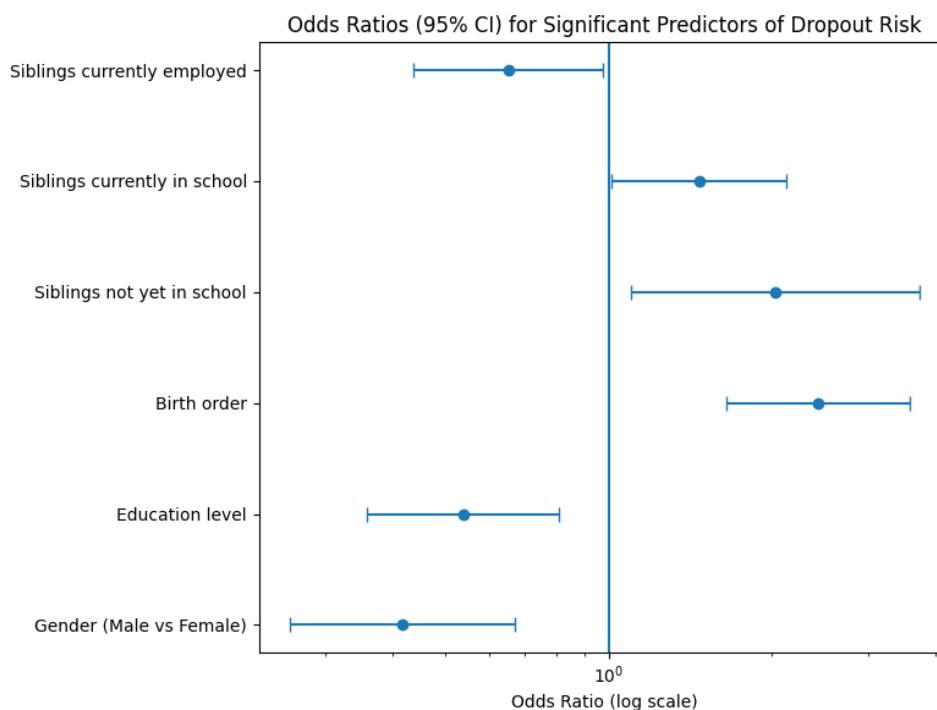


Figure 1. Forest plot of adjusted ORs for dropout risk

5. DISCUSSION

This study focused specifically on students attending the ONIE Min Buri Center in Bangkok, aiming to elucidate demographic and familial determinants that shape dropout behavior within Thailand's non-formal education system. Beyond contributing empirical evidence to inform more responsive educational policies and learner support mechanisms, the findings deepen our understanding of the core characteristics closely associated with educational disengagement.

5.1. Descriptive overview

Demographic analyses revealed that a substantial proportion of learners originate from extended family environments, with over half identifying as firstborn and many reporting two or more siblings. Educational attainment among participants was predominantly concentrated at the upper and lower secondary levels, with gender distribution nearly balanced. However, a striking 71% of respondents reported experiencing violence—whether domestic, communal, or school-based—highlighting pervasive psychosocial vulnerabilities within this cohort. These patterns resonate with prior regional research [5], [40], which associates exposure to violence with heightened risks of school disengagement, particularly in resource-constrained settings. From an ecological standpoint, the high extent of violence indicates vulnerabilities in students' micro- (family and peer context) and exo-systems (community safety and social unrest), which together increase the risk for disengagement.

5.2. Key predictors of dropout behavior

Logistic regression analysis identified multiple statistically significant predictors of dropout risk. Notably, male students were less likely to report dropout behavior linked to violence exposure, potentially reflecting differential coping mechanisms or gendered social expectations. This gender effect aligns with earlier studies [6], [41] documenting elevated emotional strain and familial pressures among female learners. Educational attainment also emerged as a robust protective factor; students with higher educational levels exhibited significantly lower dropout rates, likely attributable to enhanced access to academic resources and greater self-efficacy. These findings corroborate extant literature emphasizing the buffering role of motivation and cognitive engagement against educational discontinuity [5].

5.3. Impact of family dynamics

Family structure variables exerted substantive influence on dropout propensity. Learners with siblings actively enrolled in school or not yet enrolled demonstrated increased dropout likelihood, plausibly due to caregiving burdens or intrafamilial competition for scarce resources. Conversely, the presence of working siblings was associated with reduced dropout risk, suggesting that economic and emotional support from employed family members fortifies educational persistence. These insights accord with regional evidence linking household financial stability to decreased educational disengagement [42]. Interestingly, total sibling count did not significantly predict dropout, indicating that functional roles and dependency status within the household, rather than sheer family size, better forecast educational risk. This underscores the necessity for nuanced, disaggregated household composition analyses in educational research [43].

5.4. Model accuracy and policy implications

The logistic regression model demonstrated moderate but meaningful explanatory power, accounting for 21.1% of dropout variance (Nagelkerke $R^2=0.211$). With a sensitivity of 96.7% in identifying high-risk students and an overall classification accuracy of 78.3%, the model is a valuable early warning tool. However, the lower specificity (32.0%) for low-risk cases is a trade-off as is typical in early warning classification models. In the field of dropout prevention, a high sensitivity is usually preferred as false negatives (non-identification of the true high-risk students) might lead to permanent educational disconnection. While they acknowledge that this approach may produce false positives, and therefore have increased false alarms in terms of resources committed to individual cases, the gap of labelling at risk learners is narrowed.

Given the high prevalence of violence reported, findings advocate for integrating trauma-informed pedagogies within ONIE programming. Exposure to violence across multiple contexts significantly elevates dropout risk, echoing research from ASEAN contexts that connects psychological instability—especially among female learners—with school disengagement [40]. While school-related factors, including stringent disciplinary measures and limited student-teacher interaction, did not emerge as major predictors, their potential cumulative impact alongside psychosocial stressors warrants further attention.

5.5. Extended discussion

Building on the preceding analysis, the study's findings can be further interpreted through the lens of Bronfenbrenner's ecological systems theory, which emphasizes the interconnected influence of microsystem factors (e.g., family composition, peer environment), mesosystem interactions (e.g., family-school relations), and exosystem conditions (e.g., community safety, economic stability) on individual outcomes. The ecological model is robustly in line with the data at several levels of systems considering these findings. At the microsystem level, the heterogeneity of sibling relationships employed siblings decreased dropout risk ($OR=0.652$) and school-enrolled siblings increased it ($OR=1.467$) created by immediate family units, directly contributes to educational outcomes. The high rate of exposure to violence at the mesosystem level (71.5%), along with low levels of institution-level predictive power, may reflect pervasive disconnection between

departing from home and arriving at school. At the exosystem and macrosystem levels, protective influence of education (OR=0.538) captures wider structural elements related to resource distribution and societal appreciation of level of learning. The significant role of violence exposure aligns with research indicating that adverse childhood experiences (ACEs) substantially disrupt educational persistence by impairing socio-emotional regulation and academic engagement [44], [45].

Furthermore, social capital theory provides a useful framework to interpret the protective effect of having employed siblings. This aligns with evidence suggesting that households with stronger intra-family support networks are better equipped to buffer educational disruption, particularly in low-resource contexts. The fact that total number of siblings was non-significant (OR=0.878, $p=0.467$), whereas sibling employed status offered protection (OR=0.652, $p=0.037$) empirically supports the postulate that functional support networks, rather than family size elucidate education resilience. The absence of significant impact from total sibling count but presence of effects from sibling roles highlights the need for more nuanced household-level measures in dropout risk modelling.

Regarding the model's modest explanatory power (Nagelkerke $R^2=0.211$), it is consistent with behavioral and social science studies employing logistic regression in similarly complex settings, where unobserved variables (e.g., learner motivation, mental health, and institutional quality) often play a major role. From an ecological framework, this lack of variation emerges as a multilevel and interactive characteristic of dropout, because it is developed by processes in nested systems that are not entirely explainable by observable demographic and familial variables. This underscores that the model, despite explaining only part of the variance, remains a valuable predictive and diagnostic tool when complemented by qualitative data and targeted monitoring systems.

Recent comparative studies in Southeast Asia reinforce the finding that psychosocial risk factors—especially exposure to violence—tend to outweigh purely institutional or logistical barriers in predicting dropout in non-formal education systems [46]. These convergences with external literature strengthen the case for integrating trauma-informed teaching practices, peer mentoring, and family counselling into ONIE's operational framework [47]. Taken together, the results highlight that successful dropout prevention is achieved through systemic policies aimed at multiple ecological levels simultaneously, i.e., a focus on support systems within families, improving communication between school and family, and tackling structural inequalities.

6. CONCLUSION

This study examined family and demographic correlates of dropout among 428 ONIE students in Bangkok, identifying gender, birth order, caregiving responsibilities, sibling employment, and exposure to violence as significant predictors of educational disengagement. Firstborn learners with caregiving burdens and those exposed to violence were at substantially higher risk of dropout, whereas financial contributions from working siblings played a protective role. These findings reinforce existing theories on structural and psychosocial barriers to education while extending the literature by demonstrating that dropout in non-formal education is shaped by interacting family roles and social vulnerabilities. By applying multivariate logistic regression to an underexplored learner population, this study advances dropout risk profiling and highlights the importance of incorporating sibling dynamics into predictive frameworks.

This study is subject to several limitations. The use of convenience sampling from a single ONIE center in Bangkok limits the generalizability of the findings. Self-reported data on violence exposure may be affected by underreporting due to social desirability bias. In addition, the cross-sectional design restricts causal inference, as temporal relationships between predictors and dropout cannot be established. Although the model achieved high sensitivity in identifying at-risk learners, its lower specificity reflects a trade-off typical of early warning systems, where minimizing false negatives is prioritized. Future research should employ longitudinal and multi-site designs to strengthen external validity and clarify causal pathways.

From a policy and practice perspective, the findings suggest the need for integrated intervention strategies that address both structural and psychosocial determinants of dropout. These include trauma-informed pedagogy, family counseling, financial support programs, and early warning systems based on demographic and behavioral indicators. Strengthening collaboration between educators, social services, and community health providers is essential to ensure timely and effective support for at-risk learners. Overall, this study contributes to the advancement of knowledge by providing a multidimensional framework for understanding and preventing dropout in non-formal education contexts.

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AUTHOR CONTRIBUTIONS STATEMENT

This journal uses the Contributor Roles Taxonomy (CRediT) to recognize individual author contributions, reduce authorship disputes, and facilitate collaboration

Name of Author	C	M	So	Va	Fo	I	R	D	O	E	Vi	Su	P	Fu
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C : Conceptualization

M : Methodology

So : Software

Va : Validation

Fo : Formal analysis

I : Investigation

R : Resources

D : Data Curation

O : Writing - Original Draft

E : Writing - Review & Editing

Vi : Visualization

Su : Supervision

P : Project administration

Fu : Funding acquisition

CONFLICT OF INTEREST STATEMENT

Authors state no conflict of interest.

DATA AVAILABILITY





The data that support the findings of this study are available from the corresponding author, [TK], upon reasonable request. The data contain information that could compromise the privacy of research participants and are therefore not publicly available.

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