

Predictive Model of the Dropout Intention of Learners in Public High Schools in Valenzuela City

Jayson U. Loayon

Pamantasan ng Lungsod ng Valenzuela, Valenzuela City, Metro Manila, Philippines

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Email of Corresponding Author: jaysonloayon398@gmail.com

Abstract

This study developed a predictive model of dropout intention among public junior high school learners in Valenzuela City by examining demographic characteristics, dropout-related factor domains, and selected dropout-related risk indicators. Anchored on the Theory of Planned Behavior, the study conceptualized dropout intention as an early indicator of potential school withdrawal and a basis for preventive intervention. A quantitative correlational-predictive research design was employed involving 4,653 Grades 7–10 learners enrolled in public secondary schools in Valenzuela City during School Year 2025–2026. Data were gathered using the researcher-developed Dropout Intention Assessment Questionnaire (DIAQ) and analyzed through descriptive statistics, Spearman's Rank-Order Correlation, and Multinomial Logistic Regression. Results showed that Family Strain was the most prominent dropout-related factor, while Environmental Factors, Academic Burnout, and Negative School Pressure were present at moderate levels. Most learners demonstrated very low dropout intention, although a small proportion exhibited moderate to very high levels, indicating vulnerability to disengagement. Correlation analysis revealed that all dropout-related factor domains were significantly and positively associated with dropout intention. Multinomial logistic regression identified Academic Burnout as the strongest and most consistent predictor, followed by Family Strain, Negative School Pressure, grade retention, chronic absenteeism, academic failure, working student status, bullying experience, health-related absenteeism, and low parental educational attainment. The final model significantly improved predictive accuracy and demonstrated acceptable explanatory power for classifying learners according to dropout intention levels. The findings indicate that dropout intention is influenced by multiple interacting academic, family, school, and personal factors and that predictive analytics can support early identification and intervention efforts for learners at risk. The study aligns with Sustainable Development Goal (SDG) 4 on Quality Education and SDG 10 on Reduced Inequalities by promoting learner retention, educational continuity, and equitable access to educational opportunities. Its sustainability contribution lies in strengthening educational, institutional, and socio-economic sustainability through evidence-based learner support and data-informed dropout prevention initiatives.

Keywords: Academic Burnout, Dropout Intention, Family Strain, Multinomial Logistic Regression, Negative School Pressure, Predictive Model, Public Junior High School Learners, Risk Indicators, Valenzuela City

1. Introduction

School dropout remains a persistent educational concern because it disrupts learners' academic progression and limits opportunities for personal, social, and economic advancement. Contemporary research views dropout as a gradual process of disengagement influenced by academic, family, school, personal, and environmental factors rather than a single event. Increasing attention has therefore been directed toward dropout intention, which serves as an early indicator of potential withdrawal and provides opportunities for timely intervention before actual school leaving occurs. In the Philippine context, ongoing educational reforms, learner retention initiatives, and data-informed decision-making efforts have highlighted the need to identify learners at risk of disengagement. Guided by this need, the present study developed a predictive model of dropout intention among public junior high school learners in Valenzuela City by examining demographic characteristics, dropout-related factor domains, and dropout-related risk indicators.

1.1 Background of the Study on Dropout Intention Among Public Junior High School Learners in Valenzuela City

School dropout continues to challenge educational systems worldwide because it interrupts learners' educational trajectories and limits opportunities for personal and socioeconomic development. Research indicates that dropout is often preceded by a gradual process of disengagement characterized by declining motivation, academic difficulties, weakened school attachment, and increasing exposure to risk factors. Consequently, identifying early signs of withdrawal is essential for timely intervention. Within the Philippine educational context, learner engagement and retention remain important concerns amid efforts to improve educational quality and learning outcomes. Recent policy discussions have emphasized persistent learning gaps, unequal access to support mechanisms, and varying learner preparedness. The Second Congressional Commission on Education (EDCOM 2) has highlighted the need for reforms that address learning deficits while promoting equity, quality, and data-informed decision-making. The transition to junior high school is particularly

critical because learners encounter greater academic demands and social adjustments. Learners with weak foundational skills may experience academic stress and reduced confidence, increasing their vulnerability to disengagement. Findings reported by EDCOM 2 revealed that many Grade 7 learners continue to experience reading readiness difficulties, which may heighten dropout vulnerability (Second Congressional Commission on Education [EDCOM II], 2026). Growing research has shifted attention from actual dropout events to dropout intention, defined as learners' thoughts or inclinations toward discontinuing education before withdrawal occurs. Examining dropout intention enables earlier detection of disengagement and supports preventive interventions (Findeisen et al., 2024; Muñoz-Inostroza et al., 2024; Véliz Palomino & Ortega, 2023). The Department of Education–National Capital Region strengthened dropout prevention through the Technical Assistance for Learners At-Risk of Dropping Out (TALA) program, which emphasizes learner-at-risk databases, technical assistance, monitoring, and intervention planning (Department of Education, 2010; Department of Education–National Capital Region, 2022, 2023). In Valenzuela City, an average high school dropout rate of 1.09 percent was recorded from School Year 2022–2023 to School Year 2024–2025, indicating the continuing need for prevention-oriented strategies. This study therefore focused on developing an interpretable predictive model of dropout intention among Grades 7–10 learners in public high schools in Valenzuela City.

1.2 Themes and Insights on Dropout Intention, Disengagement, and Learner Risk Factors

The literature consistently describes dropout as a complex, multi-causal, and process-based phenomenon shaped by personal, academic, social, and contextual influences (Chirteș, 2010; Muñoz-Inostroza et al., 2024; Véliz Palomino & Ortega, 2023). National educational reports similarly indicate that learner discontinuity results from overlapping barriers and systemic constraints (Second Congressional Commission on Education [EDCOM 2], 2025, 2026). A major theme in recent research is the recognition of dropout intention as an early warning indicator. Studies characterize dropout intention as a meaningful construct reflecting learners' cognitive and motivational states prior to withdrawal and as a useful basis for preventive intervention (Muñoz-Inostroza et al., 2024; Véliz Palomino & Ortega, 2023). Although intention does not always result in actual dropout, evidence suggests a positive relationship between intention and subsequent dropout behavior (Findeisen et al., 2024). The reviewed literature further identifies several domains associated with dropout intention. Family strain, particularly economic pressure and employment-related demands, has been repeatedly linked to disengagement and non-attendance (EDCOM 2, 2025; Parreño, 2023). Academic burnout, including stress, exhaustion, and declining motivation, contributes to withdrawal tendencies (Véliz Palomino & Ortega, 2023; Muñoz-Inostroza et al., 2024; EDCOM 2, 2025, 2026). Negative school pressure involving school climate, student–teacher relationships, academic performance pressures, and bullying experiences also influences disengagement (Orion et al., 2014; Herrin et al., 2024; EDCOM 2, 2025). Environmental barriers such as disasters, transportation difficulties, and infrastructure constraints further affect educational continuity (EDCOM 2, 2025, 2026; Banaag et al., 2024). Research likewise highlights the importance of risk indicators and early warning systems. Attendance, behavior, and academic performance remain among the most reliable indicators for identifying learners at risk (Jobs for the Future, 2014; Colorado Department of Education, n.d.; Balfanz & Byrnes, 2019).

1.3 Local, National, and Global Context of Learner Dropout Intention and Retention

Globally, dropout prediction research supports the use of statistical and machine learning approaches to identify learners at risk. Logistic regression, decision trees, random forests, and ensemble models have demonstrated effectiveness in predicting dropout and informing intervention strategies (Franklin & Trouard, 2014; Seo et al., 2024; Venkatesan et al., 2024; Rabelo & Zárate, 2025; Ujkani et al., 2022). Nationally, EDCOM 2 reports identified learning deficits, bullying concerns, financial barriers, and structural constraints as important contributors to disengagement (EDCOM 2, 2025, 2026; Herrin et al., 2024). PSA-based analyses further identified educational costs and employment-related responsibilities as major reasons for non-attendance (Parreño, 2023). School-based evidence also points to financial difficulties, lack of interest, and employment obligations as common dropout-related concerns (Butawan, 2020). Locally, Philippine studies have demonstrated the feasibility of predictive analytics for identifying learners at risk of dropping out. Logistic regression and decision-tree approaches have successfully identified significant predictors of learner vulnerability and supported intervention planning in basic education settings (Trivino et al., 2017; Daligcon et al., 2019/posted 2024).

1.4 Theoretical and Conceptual Basis of Dropout Intention Prediction Among Public Junior High School Learners

The study is anchored on the perspective that dropout is a developmental process occurring over time rather than a single event (Findeisen et al., 2024; Véliz Palomino & Ortega, 2023). Its primary theoretical foundation is the Theory of Planned Behavior (TPB) proposed by Ajzen (1991), which posits that intention is the most immediate predictor of behavior. Applied to education, TPB suggests that learners who increasingly contemplate leaving school may be more vulnerable to eventual dropout. Intentions emerge from learners' perceptions, experiences, opportunities, and constraints. Academic difficulties, family-related pressures, negative school experiences, and personal challenges may therefore strengthen dropout intentions. The theory further recognizes that intention does not automatically result in behavior because contextual and environmental conditions may either facilitate or constrain action. This perspective aligns with findings indicating that dropout intention is positively associated with actual dropout while remaining influenced by surrounding conditions (Findeisen et al., 2024). The conceptual framework positions dropout intention as the primary outcome variable and assumes that variation in

dropout intention levels is influenced by demographic characteristics, dropout-related factor domains, and dropout-related risk indicators. Demographic variables include age, sex, and grade level. Dropout-related factor domains include family strain, academic burnout, negative school pressure, and environmental factors. Risk indicators include educational risk history, work and responsibility risks, health and personal risks, and family structural risks. The framework assumes that greater exposure to these conditions increases vulnerability to disengagement and higher dropout intention.

1.5 Research Gaps and Rationale for Developing a Predictive Model of Learners' Dropout Intention

Existing literature has largely focused on actual dropout occurrences, while comparatively fewer studies have examined dropout intention as a precursor to school withdrawal. Although evidence supports the relationship between dropout intention and eventual dropout behavior (Findeisen et al., 2024), there remains a need for context-specific predictive models that identify learners before disengagement progresses into actual dropout. Furthermore, many studies investigate isolated factors rather than integrating demographic characteristics, psychosocial domains, and risk indicators within a single predictive framework. Limited evidence also exists regarding the development of interpretable predictive models for public junior high school learners in the Philippine context, particularly in Valenzuela City. This study addresses these gaps by examining dropout intention as an early warning indicator and by developing a multinomial logistic regression model that integrates demographic, psychosocial, and risk-related predictors. The resulting model provides a practical basis for early identification, intervention planning, and learner retention efforts.

1.6 Alignment of the Predictive Model of Learners' Dropout Intention with Relevant Sustainable Development Goals (SDGs)

The study aligns primarily with SDG 4 – Quality Education, which seeks to ensure inclusive and equitable quality education and promote lifelong learning opportunities for all. By identifying factors associated with dropout intention and supporting early intervention strategies, the study contributes to learner retention and educational continuity. The study also supports SDG 8 – Decent Work and Economic Growth, as reducing school dropout enhances educational attainment, employability, and long-term economic participation. Findings related to family strain, employment responsibilities, and educational persistence provide insights into factors affecting learners' future socioeconomic opportunities. Additionally, the study relates to SDG 10 – Reduced Inequalities by addressing educational barriers experienced by vulnerable learners and supporting data-driven interventions that promote equitable educational outcomes.

1.7 Importance of the Predictive Model of Learners' Dropout Intention to Multidisciplinary Sustainability

The study contributes to educational sustainability by supporting evidence-based approaches that strengthen learner retention, reduce dropout risk, and improve educational outcomes. Through early identification of learners at risk, schools can allocate resources more effectively and implement targeted interventions that sustain participation in education. The study also contributes to socio-economic sustainability by addressing factors associated with educational discontinuity, which may influence future employment opportunities, income potential, and social mobility. By helping learners remain engaged in school, the study supports long-term human capital development. From a policy and institutional sustainability perspective, the predictive model provides educational leaders with a practical decision-support tool for strengthening learner monitoring systems, improving intervention planning, and enhancing the effectiveness of dropout prevention initiatives. The findings likewise support data-informed governance and continuous improvement in educational programs aimed at reducing learner disengagement and promoting academic success.

2. Material and methods

2.1 Research Design

This study employed a quantitative research design utilizing a correlational-predictive approach. The design was selected to examine the relationships between selected predictor variables and learners' dropout intention levels without manipulating any of the variables under investigation. Specifically, the study examined how family strain, academic burnout, negative school pressure, environmental factors, and selected dropout-related risk indicators were associated with dropout intention among public junior high school learners in Valenzuela City. The correlational component determined the relationships between these variables and learners' dropout intention levels, while the predictive component identified variables that significantly contributed to variations in dropout intention and developed a statistical model capable of classifying learners according to their level of dropout intention. Through this approach, the study generated evidence not only on the existence of relationships among variables but also on their relative contribution to predicting dropout intention. The findings served as the basis for developing recommendations that may support learner retention initiatives and early intervention efforts in public secondary schools.

2.2 Population and Sample

The respondents of the study were junior high school learners enrolled in all public secondary schools in Valenzuela City during School Year 2025–2026. Learners from Grades 7 to 10 were included to ensure representation across the entire junior high school cycle and to examine patterns of dropout intention among learners at different stages of secondary

education. The respondents represented diverse educational, social, and family backgrounds, allowing the study to capture variations in dropout-related factors and risk indicators. A multi-stage sampling technique was employed to ensure adequate representation of public secondary schools and grade levels across the division. Participation in the study was voluntary, and only learners who provided informed consent and met the inclusion criteria were included in the final sample.

2.3 Research Instrument

The primary data-gathering instrument was the researcher-developed Dropout Intention Assessment Questionnaire (DIAQ). The instrument was designed in a bilingual English–Filipino format to facilitate comprehension and ensure accurate interpretation of items among junior high school learners. The questionnaire consisted of four parts: (1) respondents' demographic profile, including age, sex, and grade level; (2) dropout-related factors composed of 24 Likert-scale items covering family strain, academic burnout, negative school pressure, and environmental factors; (3) twelve dichotomous items measuring exposure to dropout-related risks such as academic failure, absenteeism, work responsibilities, caregiving duties, bullying, health concerns, family circumstances, and residential mobility; and (4) dropout intention, consisting of nine Likert-type statements that assessed learners' thoughts of leaving school, reduced commitment, emotional detachment, and perceived likelihood of discontinuing education. Higher scores in the final section indicated stronger dropout intention. The instrument was aligned with the objectives of the study and generated data suitable for descriptive, correlational, and predictive analyses.

2.4 Validation of the Instrument

To establish content validity, the questionnaire was evaluated by three experts from the Schools Division Office of Valenzuela City, particularly from the Planning and Research Section and the Curriculum Implementation Division. The validators assessed the instrument in terms of clarity, relevance, accuracy, and appropriateness of the items. Their comments and recommendations were incorporated into the final version of the questionnaire. A pilot test involving 184 junior high school learners who were not included in the actual study sample was conducted to determine reliability. Internal consistency was assessed using Cronbach's alpha. Results showed acceptable to good reliability across all domains, with coefficients of 0.86 for Family Strain, 0.78 for Academic Burnout, 0.82 for Negative School Pressure, 0.84 for Environmental Factors, and 0.89 for Dropout Intention. These findings indicated that the DIAQ was a reliable instrument for assessing dropout-related factors and dropout intention among junior high school learners.

2.5 Data Gathering Procedure

A multi-stage stratified sampling technique with proportional allocation was employed to ensure adequate representation of learners across public secondary schools in Valenzuela City. Prior to data collection, an a priori power analysis was conducted using G*Power version 3.1.9.7, which indicated a minimum required sample size of 3,501 respondents. To account for potential nonresponse, a target population of 12,000 learners was established. After obtaining the necessary approvals, official enrollment data were secured from the Planning and Research Section of the Schools Division Office of Valenzuela City. Sampling was conducted in two stages: first, by stratifying respondents according to school enrollment, and second, by proportionally allocating respondents across Grades 7 to 10 within each school. Classroom advisers assisted in the random selection of learners based on the allocation matrix. Selected learners received a Parents' Consent Form containing a QR code linked to the online DIAQ. Only learners with parental or guardian consent were allowed to participate. Data collection was conducted from February to March 2026, resulting in 4,653 completed responses, exceeding the minimum sample size requirement and providing sufficient statistical power for the planned analyses.

2.6 Data Analysis Techniques

All data were encoded, screened, and analyzed using IBM SPSS Statistics Version 25. Descriptive and inferential statistical procedures were employed at the 0.05 level of significance using two-tailed tests. Frequency and percentage distributions were used to describe respondents' demographic characteristics and the prevalence of dropout-related risk indicators. Mean and standard deviation were utilized to determine the levels of dropout-related factor domains and dropout intention. Spearman's Rank-Order Correlation (Spearman's rho) was employed to examine the relationship between dropout-related factor domains and dropout intention because preliminary screening indicated non-normality among several variables. To determine the significant predictors of dropout intention levels, Multinomial Logistic Regression (MLR) was utilized. The Very Low dropout intention category served as the reference group. MLR was selected after preliminary testing revealed a violation of the proportional odds assumption required for Ordinal Logistic Regression. Additional analyses included Likelihood Ratio Tests to determine the contribution of individual predictors, Model Fitting Information to assess model improvement over the intercept-only model, Pseudo R-Square indices to estimate explanatory power, and Goodness-of-Fit statistics to evaluate model adequacy.

2.7 Ethical Considerations

Ethical principles were strictly observed throughout the conduct of the study. Prior to data collection, approvals were secured from the Schools Division Office of Valenzuela City and coordination was undertaken with school heads and

research coordinators. Since the respondents were minors, informed parental consent and learner assent were obtained before participation. The objectives, procedures, voluntary nature of participation, and participants' rights were clearly communicated to both learners and parents. Respondents were informed that participation was voluntary and that they could withdraw at any stage without penalty. Confidentiality and anonymity were maintained by ensuring that no personally identifiable information was collected. Data were used solely for academic purposes, reported only in aggregate form, and stored securely with access restricted to the researcher. The questionnaire was designed using age-appropriate, non-threatening language and was presented in a bilingual English-Filipino format to enhance understanding and minimize discomfort. The study adhered to the ethical principles of respect for persons, beneficence, and justice, ensuring the protection of participants' rights, privacy, safety, and well-being throughout the research process.

3. Results and Discussion

3.1 Profile of Learners and Dropout-Related Conditions

3.1.1 Sex Distribution of Learners

The study involved 4,653 junior high school learners, of whom 65.4% were female and 34.6% were male. The predominance of female respondents reflects participation patterns within the selected schools. Nevertheless, both sexes were adequately represented, allowing sex to be examined as a demographic predictor of dropout intention.

3.1.2 Age Distribution of Learners

Most respondents were between 12 and 15 years old, with 50.1% aged 14–15 and 36.9% aged 12–13. Learners aged 16–18 comprised 12.0%, while only 1.0% were 19 years old and above. This distribution reflects the typical age composition of junior high school learners and captures students undergoing important developmental, academic, and social transitions. Understanding dropout intention within this age group is relevant because adolescence is often associated with increasing responsibilities and educational challenges.

3.1.3 Grade Level Distribution of Learners

Respondents were distributed across Grades 7 to 10, with Grade 8 learners comprising the largest group (29.2%), followed by Grade 7 (28.2%), Grade 9 (23.0%), and Grade 10 (19.6%). The representation across all year levels allowed the study to examine dropout intention throughout the junior high school cycle. The larger proportion of Grade 7 and Grade 8 learners provided insights into students adjusting to secondary education, while the inclusion of higher grade levels allowed assessment of learners nearing completion of junior high school.

3.2 Levels of Dropout-Related Factors and Risk Indicators

3.2.1 Dropout-Related Factor Domains

Family Strain registered the highest level ($M = 3.58$, $SD = 0.91$), corresponding to a High level. Environmental Factors ($M = 3.32$, $SD = 0.88$), Academic Burnout ($M = 3.05$, $SD = 0.79$), and Negative School Pressure ($M = 2.99$, $SD = 0.89$) were rated at Moderate levels. The findings indicate that family-related pressures were the most prominent challenges experienced by learners. Financial difficulties, household responsibilities, and family concerns appeared more influential than school-related or personal challenges. This pattern is consistent with evidence identifying financial constraints and family-related pressures as important contributors to educational discontinuity (EDCOM 2, 2025; Parreño, 2023; Butawan, 2020). The moderate levels of academic burnout, school pressure, and environmental concerns further suggest that dropout-related experiences arise from multiple interacting influences rather than a single source of difficulty.

3.2.2 Dropout Risk Indicators

Parental unemployment status (29.0%), health-related absenteeism (26.7%), and bullying experience (25.7%) were the most frequently reported risk indicators. Other notable indicators included low parental educational attainment (18.2%), caregiving responsibility burden (16.9%), history of academic failure (16.3%), residential mobility (14.4%), chronic absenteeism (11.7%), and income contribution responsibility (10.7%). These findings demonstrate that dropout vulnerability extends beyond academic concerns. Household economic difficulties, health-related disruptions, bullying experiences, and family responsibilities contribute to learners' educational challenges. The results support the view that dropout risk is multidimensional and shaped by interactions among family, school, personal, and environmental conditions (Banaag et al., 2024; Herrin et al., 2024; EDCOM 2, 2025; Parreño, 2023; Butawan, 2020).

3.3 Distribution of Dropout Intention Levels

3.3.1 Levels of Dropout Intention

Most learners were classified under the Very Low dropout intention category (85.8%), followed by Low (8.9%), Moderate (3.4%), High (1.3%), and Very High (0.6%). Only 5.3% belonged to the Moderate-to-Very High categories. The results indicate that most learners remained committed to continuing their education despite experiencing various challenges. However, the presence of 247 learners with moderate to very high dropout intention highlights the importance of early

identification and intervention. This pattern is consistent with findings that dropout intention often develops gradually among a smaller subgroup of learners exposed to accumulating risk factors and sustained disengagement (Muñoz-Inostroza et al., 2024; Véliz Palomino & Ortega, 2023).

3.4 Relationship Between Dropout-Related Factors and Dropout Intention

3.4.1 Association of Dropout-Related Factors with Dropout Intention

All dropout-related factor domains were significantly and positively associated with dropout intention ($p < .01$). Negative School Pressure showed the strongest relationship ($p = .389$), followed by Academic Burnout ($p = .374$), Family Strain ($p = .354$), and Environmental Factors ($p = .255$). The findings suggest that learners experiencing greater school pressure, academic exhaustion, family difficulties, and environmental barriers are more likely to report higher dropout intention. Negative school experiences and academic stress appear particularly influential in weakening learners' attachment to school. These results support research indicating that dropout intention develops through the accumulation of interconnected pressures and disengagement experiences (Muñoz-Inostroza et al., 2024; Véliz Palomino & Ortega, 2023; Orion et al., 2014).

3.5 Significant Predictors of Dropout Intention

3.5.1 Significant Contributors to Dropout Intention

Likelihood ratio tests revealed that age, sex, family strain, academic burnout, negative school pressure, history of academic failure, grade retention experience, chronic absenteeism, working student status, health-related absenteeism, bullying experience, and low parental educational attainment significantly predicted dropout intention. Academic burnout registered the strongest contribution among the dropout-related factor domains. The findings indicate that dropout intention is influenced by a combination of demographic, academic, psychosocial, and family-related factors. Academic burnout emerged as a particularly important predictor, suggesting that emotional exhaustion and declining motivation are central to understanding learners' vulnerability to disengagement. The results are consistent with early warning frameworks emphasizing attendance, academic progression, and school experiences as critical predictors of dropout risk (Jobs for the Future, 2014; Colorado Department of Education, n.d.; Venkatesan et al., 2024).

3.6 Predictive Performance of the Multinomial Logistic Regression Model

3.6.1 Model Fit and Explanatory Strength

The final multinomial logistic regression model significantly improved prediction compared with the intercept-only model, $\chi^2(48) = 793.809$, $p < .001$. The Nagelkerke pseudo- R^2 value of .235 indicated that approximately 23.5% of the variation in dropout intention levels was explained by the retained predictors. Goodness-of-fit results supported the adequacy of the model for predictive purposes. These findings demonstrate that dropout intention can be meaningfully predicted using demographic characteristics, psychosocial domains, and dropout-related risk indicators. Although the explanatory strength is moderate, it is considered acceptable for educational and behavioral research where outcomes are influenced by numerous interacting factors. The model therefore provides a useful framework for identifying learners at elevated risk of disengagement.

3.6.2 Contribution of Retained Predictors

All predictors retained in the final model significantly contributed to differentiating learners across dropout intention levels. Academic Burnout showed the strongest contribution, followed by Grade Retention Experience, Working Student Status, Family Strain, Chronic Absenteeism, Bullying Experience, Health-Related Absenteeism, Academic Failure, Low Parental Educational Attainment, Age, Sex, and Negative School Pressure. The results reinforce the importance of monitoring not only academic performance and attendance but also learners' emotional well-being, family circumstances, and school experiences. Effective dropout prevention requires a comprehensive approach that addresses academic, psychosocial, and environmental risk factors simultaneously.

3.7 Multinomial Logistic Regression Model of Dropout Intention

3.7.1 Predictors Across Dropout Intention Levels

The multinomial logistic regression analysis showed that Academic Burnout consistently exerted the strongest influence across Low, Moderate, High, and Very High dropout intention categories. Its effect increased progressively as dropout intention intensified. Family Strain and Negative School Pressure also demonstrated positive effects across categories, while the absence of academic failure, grade retention, chronic absenteeism, bullying, working responsibilities, and low parental educational attainment reduced the likelihood of belonging to higher dropout intention groups. These findings indicate that dropout intention develops progressively through the interaction of academic, family, school, and personal factors. Academic burnout emerged as the most influential predictor throughout the continuum, highlighting the importance of addressing learner exhaustion, motivation, and well-being. The pattern further suggests that severe dropout intention reflects the cumulative effects of multiple challenges rather than a single risk factor, supporting the need for comprehensive intervention programs (Findeisen et al., 2024; Parreño, 2023).

3.7.2 Final Multinomial Logistic Regression Equations and Probability Estimation

To operationalize the predictive model, the final multinomial logistic regression equations were derived using the predictors retained in the model. These are: age (x_1), family strain (x_2), academic burnout (x_3), negative school pressure (x_4), sex (x_5) female = 1, male = 0, no history of academic failure (x_6), no history of grade retention (x_7), no chronic absenteeism (x_8), not working (x_9), no health-related absenteeism (x_{10}), no bullying experience (x_{11}), and higher parental education (x_{12}). The general multinomial logistic regression model is expressed as:

$$\ln \left(\frac{P(Y = j)}{P(Y = \text{Very Low})} \right) = \beta_{0j} + \sum_{k=1}^p \beta_{kj} X_k \quad (1)$$

where:

- Y = dropout intention category;
- j = Low, Moderate, High, or Very High dropout intention category;
- β_{0j} = intercept for category j ;
- β_{kj} = regression coefficient of predictor k for category j ;
- X_k = predictor variable;
- $P(Y = j)$ = probability of belonging to category j ;
- $P(Y = \text{Very Low})$ = probability of belonging to the reference category.

The probability of membership in a given dropout intention category is computed using:

$$P(Y = j) = \frac{\exp(\eta_j)}{1 + \sum_{m \in \{\text{Low}, \text{Moderate}, \text{High}, \text{Very High}\}} \exp(\eta_m)} \quad (2)$$

where:

$$\eta_j = \beta_{0j} + \sum_{k=1}^p \beta_{kj} X_k \quad (3)$$

The probability of membership in the reference category (Very Low Dropout Intention) is:

$$P(Y = \text{Very Low}) = \frac{1}{1 + \sum_{m \in \{\text{Low}, \text{Moderate}, \text{High}, \text{Very High}\}} \exp(\eta_m)} \quad (4)$$

Derived Model of Dropout Intention Level

Equation 1. Low vs. Very Low Dropout Intention

$$\ln \left(\frac{P(\text{Low})}{P(\text{Very Low})} \right) = -3.343 + 0.054x_1 + 0.267x_2 + 0.615x_3 + 0.230x_4 - 0.420x_5 - 0.165x_6 - 0.893x_7 - 0.180x_8 - 0.900x_9 - 0.433x_{10} - 0.371x_{11} - 0.349x_{12} \quad (5)$$

Equation 2. Moderate vs. Very Low Dropout Intention

$$\ln \left(\frac{P(\text{Moderate})}{P(\text{Very Low})} \right) = -4.963 + 0.107x_1 + 0.288x_2 + 0.761x_3 + 0.253x_4 - 0.368x_5 - 0.167x_6 - 0.861x_7 - 0.897x_8 - 1.160x_9 - 0.175x_{10} - 0.574x_{11} - 0.479x_{12} \quad (6)$$

Equation 3. High vs. Very Low Dropout Intention

$$\ln \left(\frac{P(\text{High})}{P(\text{Very Low})} \right) = -7.941 + 0.194x_1 + 0.302x_2 + 1.131x_3 + 0.283x_4 - 0.977x_5 - 0.582x_6 - 1.396x_7 - 0.740x_8 - 0.698x_9 - 0.459x_{10} - 0.768x_{11} - 0.401x_{12} \quad (7)$$

Equation 4. Very High vs. Very Low Dropout Intention

$$\ln \left(\frac{P(\text{Very High})}{P(\text{Very Low})} \right) = -12.050 + 0.097x_1 + 0.648x_2 + 1.626x_3 + 0.767x_4 - 0.361x_5 - 1.133x_6 - 1.824x_7 - 0.787x_8 - 0.725x_9 - 0.223x_{10} - 0.636x_{11} - 0.251x_{12} \quad (8)$$

Interpretation of the Model

The derived multinomial logistic regression equations estimate the probability of a learner belonging to the Low, Moderate, High, or Very High dropout intention categories relative to the Very Low dropout intention category, which serves as the reference category. Each equation models the log-odds of membership in a specific dropout intention category compared with the reference category.

Positive regression coefficients indicate that an increase in a predictor variable is associated with higher odds of belonging to a particular dropout intention category relative to the Very Low dropout intention category. Conversely, negative regression coefficients indicate lower odds of belonging to that category relative to the reference category. The magnitude of the coefficients reflects the strength of the association between each predictor and the corresponding dropout intention category.

The model suggests that age, family strain, academic burnout, negative school pressure, and selected learner-risk characteristics collectively explain variations in learners' dropout intention levels. As a predictive model, it may serve as an evidence-based decision-support tool for the early identification of learners who may require targeted interventions to prevent school disengagement and support school retention initiatives.

4. Conclusion & Recommendations

The study found that dropout intention among public junior high school learners in Valenzuela City was generally low, although a small group of learners exhibited moderate to very high levels of dropout intention, indicating vulnerability to disengagement. Dropout intention was influenced by multiple interconnected academic, family, school, and personal factors. Academic burnout emerged as the strongest and most consistent predictor, followed by family strain, negative school pressure, grade retention, chronic absenteeism, academic failure, working student status, bullying experience, health-related absenteeism, and low parental educational attainment. The findings further demonstrated that dropout intention develops through the interaction of multiple risk conditions and that multinomial logistic regression provides a useful framework for identifying learners at varying levels of dropout intention for early intervention and dropout prevention efforts.

Schools should strengthen learner monitoring and intervention systems by incorporating predictive indicators such as academic burnout, family strain, chronic absenteeism, grade retention, bullying experience, and other significant risk factors into existing support programs. Teachers, guidance personnel, parents, guardians, the Department of Education, and Local Government Units should collaborate in promoting learner well-being, strengthening family and school support mechanisms, improving data-informed decision-making, and providing academic, psychosocial, and financial assistance to learners at risk. Future studies should examine additional variables, validate the predictive model in other educational settings, conduct longitudinal investigations, and integrate qualitative approaches to further enhance understanding of dropout intention and improve the development of responsive dropout prevention initiatives.

The study was limited to public junior high school learners in Valenzuela City and focused on selected demographic characteristics, dropout-related factor domains, and risk indicators included in the predictive model. Although the model demonstrated significant predictive performance, a substantial proportion of variation in dropout intention remained unexplained, suggesting that other relevant factors may also influence learners' intentions. In addition, the study relied on self-reported data collected at a single point in time, which limited the ability to determine changes in dropout intention over time or establish whether dropout intention eventually translated into actual dropout behavior.

Compliance with ethical standards

The study was conducted in accordance with established ethical principles to ensure the protection of participants' rights, privacy, safety, and well-being. Participation was voluntary, and appropriate permissions and informed consent procedures were secured prior to data collection. Confidentiality and anonymity were maintained throughout the study, and all data were used solely for academic purposes and handled with appropriate safeguards.

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