



# Explanatory Factors of Academic Failure at the Higher Institute of Medical Techniques of Kinshasa: Analysis of Logistic Regression

Antoine Oleko Djamba Dikoke, Marie-Louise Nyidi Ambokawa, Patrick-Hilaire Okolongo Woma, Norbert-Daniel Okitawongo Lohohola, Gilbert Akata Dikete

Higher Institute of Medical Techniques of Tshumbe (ISTM-Tshumbe), Tshumbe, Democratic Republic of the Congo

Email: antoineoleko@gmail.com

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## Abstract

**Objective:** The general objective of this research is to identify the factors associated with academic failure among students of the Higher Institute of Medical Techniques of Kinshasa (ISTM-KIN). **Methods:** The transversal explanatory method was used in this research, with an interview questionnaire with students enrolled in second graduates and second licenses at ISTM-KIN. Data were entered and analyzed using Stata software. **Results:** For this study, we obtained the following results: single students were more common (69.50%), most (49.30%) of the students had fathers with a university education level, 46.80% of students experienced academic failure, 55.00% of students showed stress during exams, 53.90 of them did not visit the library regularly, 37.90% of students had difficulty paying fees studies, 46.60% of parents did not have sufficient means to support their children's studies. The following explanatory factors were identified: older students OR: 1.09 (1.05 - 1.15), paying tuition fees late OR: 1.61 (1.04 - 2.50), living far from the OR campus: 1.60 (1.00 - 2.56), often arriving late for classes OR: 1.72 (1.04 - 2.84), and finally, not practicing regularly reading notes before and during exams OR: 2.09 (1.31 - 3.37). **Conclusion:** The following explanatory factors for academic failure were revealed: older students, late payment of study fees, living far from campus, regularly arriving late for classes, and neglect of reading regular course notes before and during exams. The construction of homes for students, the improvement of the socio-cultural and economic conditions of parents, the promotion of regular reading before and during evaluations prove essential for resolving the situation of academic failure at ISTM-KIN.

## Subject Areas

Psychiatry & Psychology

## Keywords

Explanatory Factors, Students, ISTM-KIN, Kinshasa, DRC

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## 1. Background

Education is a powerful lever for human flourishing, as it has a strong impact on the development of human and institutional capacities. It has become essential for all individuals in the world and the right to education is imperative these days. The Universal Declaration of Human Rights (UDHR), adopted by the United Nations (UN) in 1948, affirms that “everyone has the right to education” [1].

Around the world, every year, many students enter the vicious circle of academic failure. Their motivation decreases as the days go by, their results drop and their self-esteem is affected. Students compare themselves with others, and fail to regain the taste for learning.

Thus, academic failure seems to be a scourge for many higher institutes, which is also the reason why this problem fuels the speeches of ministers of higher education and universities [2].

The “shock” figure of failure in higher and university education brandished for governments to establish the reform it is preparing, includes ghost students, present intermittently or oriented by default. How can we accept, looking at an amphitheater of 500 students, to imagine that nearly two thirds will leave the faculty without a diploma? “60% failure after four years at university!” brings the government to every speech on higher education. This figure is enough to “make your blood run cold” in the words of the French Prime Minister, frightened by this “terrible” selection “by failure” [3].

In Africa, the first approaches to academic failure call into question the abilities of the student, however explanations based on intellectual deficit only cover a tiny part of the phenomenon [4].

According to the UNESCO and IBE (International Bureau of Education) report, there has been an increase in the repetition rate for all African countries ranging from 30% in 2009 to 41.1% in 2011 [5].

In the Democratic Republic of the Congo, the problem of “academic failure” is not recent and has not always been perceived as a problem: a high failure rate was even considered for a time as a “selection” which took place “naturally” or even, for certain teachers, as a guarantee of excellence of the diploma awarded [6].

This problem of academic failure, however, remains relevant today, particularly in the first cycle of the country’s Higher Institutes. Thus, among students enrolled in the first year of higher education in 2011-2012, 43.8% moved on to the second year, while 29% repeated a year and 27.2% left the university system without a diploma or qualification [7]. It is certainly necessary to put these figures into perspective by questioning the definition of the term “academic failure of students”.

Considering the report of three consecutive years of tests for the certification evaluation (2014, 2016 and 2017) shows that the failure rate of students has reached 60.3% and remains a major problem in the field of health sciences [8].

The Congolese school in general and Kinshasa in particular is seriously ill. This is the unanimous conclusion that emerges from the criticisms coming from all sides. Because even if education experienced an increase of 7% from 2006-2007 to 2007-2008, going from 84% to 91%, the deterioration of success in higher and university education is obvious; this is crudely manifested in the fact that corruption has become part of academia. Diligence and intelligence are no longer the only means to “Success”; a little more money is enough to move up to the next class. Moreover, there is the so-called “Monitoring” phenomenon among academic activities [9].

This study aimed to identify the different factors associated with academic failure among students of the Higher Institute of Medical Techniques of Kinshasa (ISTM-KIN). To achieve this, the following specific objectives were defined: describe the socio-demographic and cultural characteristics of the subjects surveyed, describe the individual factors linked to the evaluation of students, identify the economic, environmental and pedagogical factors linked to academic failure, and formulate some suggestions to minimize the incidence of academic failure at ISTM-KIN.

Hypotheses: based on what we see on the ground, we believe that: unfavorable individual, social and environmental, economic and educational factors influence academic failure at the Higher Institute of Medical Techniques of Kinshasa.

This study has four main points. The first, an introduction which traces the importance and objectives of the study, the second, deals with my methodology used, the third presents the results and the fourth finally, initiates a discussion. A brief conclusion completes this study.

## **2. Materials and Methods**

### **2.1. Study Framework**

The Higher Institute of Medical Techniques of Kinshasa is located in the commune of mont-ngafula; on the section linking the Ngaba roundabout and the Catholic missionary town of Kimwenzha, just opposite the neuro-pathological center (CNPP), one of the university clinic departments of Kinshasa (CUK and some 12 km as the crow flies from the downtown Kinshasa in the Democratic Republic of the Congo.

ISTM-KIN has its roots in the distant past, before its effective creation in May 1973, by a decision of the revolutionary council of the National University of Zaire (UNAZA) held in Kisangani, several higher medical schools provided teaching in the medico-social field in Kinshasa.

These were the school of nursing fitters at the former Danish clinic, the medical education institute (IEM), physiotherapy at the IPN, the School of

radiology at the general hospital of reference of Kinshasa and the national school of administration (ENA). These are the schools which later became integral entities of the ISTM-KIN. And their common objective was to provide medical training with highly qualified personnel, capable of validly collaborating with the doctor in the care of patients. The grouping of these specialized schools gave birth to the higher institute of medical techniques [10].

## 2.2. Type and Period of Study

This study is explanatory transversal which took place approximately six years, that is to say from October 13, 2020 to March 14, 2021.

## 2.3. Study Population

The population for this study consisted of all students registered at ISTM-KIN for the 2019-2020 academic year from second degree to second degree.

## 2.4. Sampling

For this study, we carried out cluster probability sampling, each section constituted a cluster. The sample size for this study was determined by the following formula:

$$n \geq \frac{Z_a^2 PQ}{d^2}; n \geq \frac{1.96^2 \cdot 0.60 \cdot 0.40}{0.05^2} \geq 369$$

$n$ : minimum sample size,  $Z_a$ : Confidence coefficient for a confidence level of 95% ( $\alpha = 0.05$ ), this coefficient is equal to 1.96,  $P$ : proportion of students having experienced the situation of academic failure,  $Q$ : proportion of students who have not experienced the situation of academic failure,  $d$ : degree of precision. To increase the power of this study, we increased by 10%, the 10% of 369 represents 37 so the sample size for this study is  $369 + 37 = 406$  students to be included in this study. A random survey allowed us to select six sections (see **Table 1**) out of the 12 that make up the ISTM-KIN, these are the sections: Midwifery, Community Health, Nutrition and Dietetics, Management of Health Institutions, Medical Imaging and Nursing Sciences.

**Table 1.** Proportional distribution of respondents by section.

No	Section	Number of students	Proportion	Sample
1	Midwife	403	0.079	32
2	Medical imaging	213	0.042	17
3	Nutrition and dietetic	457	0.090	37
4	Management of Health Institutions	376	0.074	30
5	Community Health	630	0.123	50
6	Nursing Sciences	2900	0.592	240
	<b>Total</b>	<b>4979</b>	<b>1.00</b>	<b>406</b>

## 2.5. Collection of Data

The data for this study were collected by 6 second EASI (Teaching, Nursing Administration) students previously trained in survey techniques. Self-administered and documentary questionnaire techniques served as data collection techniques. Each student received an adapted questionnaire with closed questions to obtain the necessary information; this questionnaire was returned after 4 days (See **Table 2**).

**Table 2.** Proportional distribution of respondents by orientation/promotion.

No	Guidelines	Promotions	n	Proportion	Sample
1.	Midwife	G2	192	0.476	15
		G3	158	0.392	13
		L1	14	0.035	1
		L2	39	0.097	3
		<b>Total</b>	<b>403</b>	<b>1.000</b>	<b>32</b>
2.	Medical imaging	G2	93	0.437	7
		G3	79	0.037	6
		L1	8	0.038	1
		L2	33	0.155	3
		<b>Total</b>	<b>213</b>	<b>1.000</b>	<b>17</b>
3.	Nutrition and dietetic	G2	208	0.455	17
		G3	149	0.326	12
		L1	39	0.085	3
		L2	61	0.135	5
		<b>Total</b>	<b>457</b>	<b>1.000</b>	<b>37</b>
4.	Management of Health Institutions	G2	129	0.343	10
		G3	127	0.338	10
		L1	32	0.085	3
		L2	88	0.234	7
		<b>Total</b>	<b>376</b>	<b>1.000</b>	<b>30</b>
5.	Community Health	L1	337	0.535	27
		L2	293	0.464	23
		<b>Total</b>	<b>630</b>	<b>1.000</b>	<b>50</b>
6.	Hospitable	G2	1057	0.532	87
		G3	929	0.468	77
		<b>Total</b>	<b>1986</b>	<b>1.000</b>	<b>164</b>
7.	Pediary	G2	460	0.591	38
		G3	319	0.409	27
		<b>Total</b>	<b>779</b>	<b>1.000</b>	<b>65</b>

**Continued**

		G2	3	0.022	0
		G3	3	0.022	1
8.	EASI	L1	75	0.556	6
		L2	54	0.040	4
		<b>Total</b>	<b>135</b>	<b>1.000</b>	<b>11</b>

This instrument included the characteristics of the respondents and the substantive questions. The following variables were taken into account: the dependent variable was academic failure, and the independent variables were: sex, age, parents' education level, marital status, parents' economic situation, combining studies with other things, having self-confidence, giving priority to your studies, attending classes regularly, having stress during exams, going to libraries, taking sole responsibility for studies, paying academic fees on time, stay close to your campus/institution, arrive on time for the course, have both parents alive, apply the best teaching methods, respect the volume of course fees, ask evaluation questions outside the subjects taught, have met a teacher who had a negative influence, choose your own direction.

## 2.6. Data Analysis

The information collected for this study was entered and analyzed using SPSS Version 25 software. For the research between the dependent variable (academic failure) and the independent variables, we carried out the bivariate analysis by the Pearson Chi-Square test and multi-variable analysis using logistic regression.

### 2.6.1. Bivariate Analysis

This analysis is carried out by the Chi-Square test ( $\chi^2$ ) of association which is a test used to estimate the association between the dependent variable and the independent variables.

$$\text{Formula: } \chi^2 = \sum \frac{(fo - fc)^2}{fc} \quad [11].$$

With :

- $\chi^2$  Chi-Square,
- fo observed frequency,
- fc calculated frequency.

#### ❖ Interpretation of chi square test

- The p value < 0.05 was the threshold for statistical significance.
- \* = p < 0.05; \*\* = p < 0.01; \*\*\* < 0.001; NS = not significant [11] [12].

### 2.6.2. Logistic Regression

The logistic regression analysis was done using the following formulas:

#### Simple logistic regression

$$Y = \beta + \beta * x$$

### Multiple logistic regression

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_k X_k \quad [13]$$

**Interpretation:** if 1 is within the confidence interval of OR, the difference is not significant, if the upper limit of the confidence interval of OR is less than 1, the difference is significant and the factor studied is a protective factor, if the lower limit of the confidence interval of OR is greater than 1, the difference is significant and the factor studied is a risk factor. This threshold is set in 95% confidence interval [14].

### 2.7. Ethical Considerations

For this study, all the information relating to this study was secret, to reassure the respondents of the confidentiality of this information, this information was anonymous, we did not transcribe the names of the respondents on the survey questionnaire, however, an identification number was given to each copy of the survey questionnaire.

## 3. Results

This study includes a total of 406 respondents including 192 male and 214 female students. Here, we report the results of the determinants of academic failure at the Higher Institute of Medical Techniques of Kinshasa through its different Sections.

It appears from these results that the median age of the respondents was 27 (24 - 31) years old. The average number of people per household is  $7 \pm 4$  people per household.

In this **Table 3**, the female sex presented a slight increase in frequency with 52.70%, singles were more common among respondents with 69.50%, and most of the respondents had fathers with a level of education higher and university with 49.30% while most of the respondents had mothers with a secondary level of education with 44.60%. It is also shown that 46.80% of respondents experienced academic failure. Regarding the economic status of the father and mother during studies, 62.72% of fathers were unemployed and 76.33% of mothers were unemployed. Finally, 72.19% of respondents did not have a job during their studies and 55.20% of them devoted themselves to studies only.

**Table 3.** Distribution of respondents according to general information.

Variables	n	%
<b>Sex</b>		
1. Male	192	47.30
2. Female	214	52.70
<b>Total</b>	<b>406</b>	<b>100.00</b>

## Continued

<b>Marital status</b>		
1. Single	282	69.50
2. Married	124	30.50
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Father's educational level</b>		
1. Illiterate	14	3.40
2. Primary	28	6.90
3. Secondary	164	40.40
4. Higher and university	200	49.30
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Mother's education level</b>		
1. Illiterate	22	5.40
2. Primary	69	17.00
3. Secondary	181	44.60
4. Higher and university	134	33.00
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Year of start of studies</b>		
1. 1992-2014	176	43.35
2. 2015-2020	230	56.65
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Having experienced academic failure</b>		
1. No	216	53.20
2. Yes	190	48.80
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Father's economic status</b>		
1. Employee	63	37.28
2. Unemployed	106	62.72
<b>Total</b>	<b>169</b>	<b>100.00</b>
<b>Mother's economic status</b>		
1. Employee	40	23.67
2. Unemployed	129	76.33
<b>Total</b>	<b>169</b>	<b>100.00</b>
<b>Have a job, study</b>		
1. Yes	47	27.81
2. No	122	72.19
<b>Total</b>	<b>169</b>	<b>100.00</b>
<b>Occupations during studies</b>		
1. State civil servant	71	17.50
2. Trader	111	27.30
3. Studies only	224	55.20
<b>Total</b>	<b>406</b>	<b>100.00</b>

Reading this **Table 4**, it is shown that 92.90% of respondents had confidence in themselves, 73.9% of them attended classes regularly, 55.70% of respondents took the notes regularly, 55.70% of them reported stress during exams, 87.70% of respondents reread their notes before and during exams, 53.90% of respondents agreed not to visit libraries regularly, 68.70% of respondents did not have all the course materials and 91.10% of them gave priority to studies.

**Table 4.** Distribution of respondents according to individual factors.

<b>Variables</b>	<b>n</b>	<b>%</b>
<b>Be self-confident</b>		
1. Yes	377	92.90
2. No	29	7.10
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Attend classes regularly</b>		
1. Yes	300	73.90
2. No	106	26.10
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Take notes regularly</b>		
1. Yes	313	77.10
2. No	93	22.90
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Having stress during exams</b>		
1. Yes	226	55.70
2. No	180	44.30
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Remove notes before and during exams</b>		
1. Yes	356	87.70
2. No	50	12.30
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Visit libraries regularly</b>		
1. Yes	187	46.10
2. No	219	53.90
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Have all the syllabi</b>		
1. Yes	127	31.30
2. No	279	68.70
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Prioritize studies</b>		
1. Yes	370	91.10
2. No	36	8.90
<b>Total</b>	<b>406</b>	<b>100.00</b>

The analysis of **Table 5** shows that 62.10% of respondents paid the study fees without difficulty, 31.30% of students took responsibility for their studies on their own, 53.40% of respondents accepted that their parents had sufficient means to support studies, and 47.50% of respondents had means to solve all the problems on campus.

**Table 5.** Distribution of respondents according to economic factors.

Variables	n	%
<b>Pay academic fees without difficulty</b>		
1. Yes	252	62.10
2. No	154	37.90
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Take responsibility for studying on your own</b>		
1. Yes	127	31.30
2. No	279	68.70
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Parents had sufficient means to support studies</b>		
1. Yes	217	53.40
2. No	189	46.60
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Have the means to resolve all campus problems</b>		
1. Yes	193	47.50
2. No	213	52.50
<b>Total</b>	<b>406</b>	<b>100.00</b>

This **Table 6** shows that 52.70% of students remained close to campus, 68.00% of them regularly arrived on time for classes, 73.40% of respondents had a motivating entourage and 71.70 % of respondents both had living parents.

**Table 6.** Distribution of respondents according to socio-environmental factors.

Variables	n	%
<b>Stay close to campus</b>		
1. Yes	214	52.70
2. No	192	47.30
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Arrive regularly for classes</b>		
1. Yes	276	68.00
2. No	130	32.00
<b>Total</b>	<b>406</b>	<b>100.00</b>

Continued

<b>Have a motivating environment</b>			
1. Yes	298	73.40	
2. No	108	26.60	
<b>Total</b>	<b>406</b>	<b>100.00</b>	
<b>Existence of both living parents</b>			
1. Yes	291	71.70	
2. No	115	28.30	
<b>Total</b>	<b>406</b>	<b>100.00</b>	

According to the analysis made in this **Table 7**, it is revealed that 74.90% of students recognized that the teachers apply the best teaching methods, 59.10% of them recognize that the teachers respect the hourly volume of lessons, 59.10% of respondents denounced that teachers ask exam questions outside the subjects studied. In this study, 59.10% of respondents are from nursing sciences, 40.90% of them are second graduates.

**Table 7.** Distribution of respondents according to educational factors.

<b>Variables</b>	<b>n</b>	<b>%</b>	
<b>Application of better teaching methods</b>			
1. Yes	304	74.90	
2. No	102	25.10	
<b>Total</b>	<b>406</b>	<b>100.00</b>	
<b>Respect of hourly course volumes</b>			
1. Yes	240	59.10	
2. No	166	40.90	
<b>Total</b>	<b>406</b>	<b>100.00</b>	
<b>Ask non-subject questions</b>			
1. Yes	240	59.10	
2. No	166	40.90	
<b>Total</b>	<b>406</b>	<b>100.00</b>	
<b>Meeting a teacher with a negative influence</b>			
1. Yes	143	35.20	
2. No	263	64.80	
<b>Total</b>	<b>406</b>	<b>100.00</b>	
<b>Followed section</b>			
1. Nursing	240	59.10	
2. Nutrition-dietetics	37	9.10	
3. Community health	50	12.30	

**Continued**

4. Midwife	32	7.90
5. Management of health institutions	30	7.40
6. Medical imaging	17	4.20
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Study promotion</b>		
1. G2	166	40.90
2. G3	151	37.20
3. L1	42	10.30
4. L2	47	11.60
<b>Total</b>	<b>406</b>	<b>100.00</b>
<b>Study orientation</b>		
1. EASI	11	2.800
2. Hospitable	164	40.40
3. Pediatrics	65	16.00
4. Management of health institutions	30	7.306
5. Medical imaging	17	4.900
6. Community health (L1)	27	6.700
7. Public health (L2)	12	2.100
8. Epidemiology (L2)	11	2.800
9. Nutrition-dietetics	37	9.113
10. Midwife	32	7.881
<b>Total</b>	<b>406</b>	<b>100.00</b>

When reading this **Table 8**, it is noticed that the father's level of education, the fact of combining studies with other affairs, the fact of giving priority to studies, self-confidence, regular study, library attendance, paying study fees on time, having sufficient means to support studies, arriving regularly on time for classes, having a motivating entourage and having all the two parents are associated with academic failure ( $p < 0.05$ ).

**Table 8.** Bivariate analysis of academic failure and other variables.

Variables	Yes	No	OR (CI OR 95%)	$\chi^2$	p<	S
<b>Father's educational level</b>						
1. Illiterate	<u>6</u>	<u>8</u>				
2. Primary	<u>15</u>	<u>13</u>		14.83	0.002	**
3. Secondary	70	94				
4. Higher and university	125	74				

## Continued

<b>Combine studies with other business</b>						
1. State civil servant	33	38				
2. Trader	44	67		16.54	0.000	***
3. Studies only	139	85				
<b>Prioritize studies</b>						
1. Yes	167	23				
			2.15 (1.06 - 4.38)	4.63	0.036	*
2. No	203	13				
<b>Have confidence in yourself</b>						
1. Yes	207	9				
			2.71 (1.20 - 6.10)	6.16	0.019	*
2. No	170	20				
<b>Study regularly</b>						
1. Yes	123	39				
			2.47 (1.55 - 3.90)			
2. No	177	67				
<b>Visit the library</b>						
1. Yes	76	114				
			1.59 (1.07 - 2.35)	5.28	0.022	*
2. No	111	105				
<b>Pay fees on time</b>						
1. Yes	149	103				
			1.88 (1.25 - 2.82)	9.36	0.002	**
2. No	67	87				
<b>Have the means to support studies</b>						
1. Yes	126	91				
			1.52 (1.03 - 2.56)	4.43	0.036	*
2. No	46	62				
<b>Arrive on time for classes</b>						
1. Yes	158	118				
			1.66 (1.09 - 2.53)	5.66	0.017	*
2. No	58	72				
<b>Have a motivating environment</b>						
1. Yes	172	128				
			1.79 (1.15 - 2.79)	6.65	0.010	*
2. No	46	62				
<b>Have both parents alive</b>						
1. Yes	165	126				
			1.64 (1.06 - 2.54)	5.05	0.025	*
2. No	51	64				

In this **Table 9**, we see that married people have 63% (1.07 - 2.51) more risk of experiencing the situation of academic failure than single people, in relation to age, it is noted that increasing one year of age exposes you to a 9% (1.05 - 1.13) greater risk of failing.

**Table 9.** Unadjusted logistic regression of academic failure and other variables.

Variables	OR (CI OR 95%)	p<
<b>Marital status</b>		
1. Single	1	0.024
2. Married	1.63 (1.07 - 2.51)	
<b>Age</b>		
	1.09 (1.05 - 1.13)	0.000
<b>Father's educational level</b>		
1. Illiterate	1	
2. Primary	0.54 (0.19 - 1.49)	0.233
3. Secondary	0.34 (0.13 - 0.87)	0.024
4. Higher and university	0.21 (0.08 - 0.54)	0.001
<b>Combine studies with other business</b>		
	1	
1. State civil servant	0.90 (0.49 - 1.63)	0.736
2. Trader	0.48 (0.28 - 0.82)	0.008
3. Studies only		
<b>Prioritize studies</b>		
	1	
1. Yes	2.1 (1.05 - 4.21)	0.036
2. No		
<b>Attend classes regularly</b>		
	1	
1. Yes	3.53 (2.22 - 5.61)	0.000
2. No		
<b>Take notes regularly</b>		
	1	
1. Yes	4.37 (2.66 - 7.19)	0.000
2. No		
<b>Having stress during exams</b>		
	1	
1. Yes	0.54 (0.36 - 0.80)	0.003
2. No		
<b>Reread notes before and during exams</b>		
	1	
1. Yes	2.34 (1.28 - 4.29)	0.006
2. No		
<b>Visit the library regularly</b>		
	1	
1. Yes	1.56 (1.07 - 2.33)	0.029
2. No		

## Continued

<b>Pay study fees on time</b>	1	
1. Yes	1.74 (1.16 - 2.61)	0.008
2. No		
<b>Parents had means to support studies</b>	1	
1. Yes	2.21 (1.48 - 3.31)	0.000
2. No		
<b>Living near campus</b>	1	
1. Yes	2.09 (1.41 - 3.14)	0.000
2. No		
<b>Arrive regularly early for classes</b>	1	
1. Yes	2.64 (1.72 - 4.05)	0.000
2. No		
<b>Have a motivating environment</b>	1	
1. Yes	2.06 (1.32 - 3.21)	0.002
2. No		
<b>Application of better teaching methods</b>	1	
1. Yes	2.55 (1.61 - 4.04)	0.000
2. No		
<b>Respect for class hours</b>		
1. Yes	1	
2. No	1.72 (1.15 - 2.57)	0.008

About level of study, students who are fathers of higher and university level have 79% (0.08 - 0.54) less risk of failing than illiterate, students who do not prioritize in studies have 2.13 (1.05 - 4.21) more risk of failing than those who grant it. Students who do not regularly attend classes are 3.53 (2.22 - 5.61) more likely to fail than those who do.

Students who do not take notes regularly are 4.37 (2.66 - 7.19) more likely to fail than those who take notes regularly. Those who do not have stress during exams have 46% (0.36 - 0.80) less risk of failing than those who do. Respondents who do not read their notes before and during exams are 2.34 (1.28 - 4.29) more likely to fail than their friends who do.

Concerning library attendance, students who do not attend are 44% (1.07 - 2.33) more likely to fail than those who do. Students who do not pay tuition fees on time are 74% (1.16 - 2.61) more risk of failing than those who pay for them, the same goes for students whose parents do not have the means to support their studies 2.21 (1.48 - 3.31).

Concerning students who do not live close to campus, those who arrive late for classes, those who do not have a motivating environment, those who think

that teachers do not use the best teaching methods and those who think that teachers do not respect the planned hourly volumes, all are more likely to fail, because 1 is not in their confidence intervals and each OR > 1.

**Table 10** shows that age is a risk factor for academic failure, the older you are, the greater the risk of failing, OR: 1.09 (1.05 - 1.15), those who do not pay study fees on time constitute a risk factor for academic failure, OR: 1.61 (1.04 - 2.50).

**Table 10.** Logistic regression adjusted for academic failure and other variables.

Variables	OR (IC OR 95%)	p<
<b>Marital status</b>		
1. Single	1	
2. Married	0.80 (0.46 - 1.40)	0.439
<b>Age</b>	1.09 (1.05 - 1.15)	0.000
<b>Having stress during exams</b>		
1. Yes	1	
2. No	0.67 (0.45 - 1.04)	0.077
<b>Pay study fees on time</b>		
1. Yes	1	
2. No	1.61 (1.04 - 2.50)	0.031
<b>Live near campus</b>		
1. Yes	1	
2. No	1.60 (1.00 - 2.56)	0.049
<b>Arrive regularly on time for classes</b>		
1. Yes	1	
2. No	1.72 (1.04 - 2.84)	0.034
<b>Reread course notes regularly before and during exams</b>		
1. Yes	1	
2. No	2.09 (1.31 - 3.37)	0.002

Living far from campus constitutes a risk factor for academic failure, OR: 1.60 (1.00 - 2.56). Finally, students who often do not arrive at class on time are more likely to fail than those who arrive regularly, OR: 1.72 (1.04 - 2.84). Finally, it is shown that students who do not practice regularly reading course notes before and during exams constitute a risk factor for academic failure, OR: 2.09 (1.31 - 3.37).

#### 4. Discussion

Remember that the present study aimed to identify the different explanatory factors of academic failure at the Kinshasa Higher Institute of Medical Techniques (ISTM-KIN). In the previous section, we presented the descriptive statistics and

logistic regression results. However, this discussion will focus on the results of the adjusted logistic regression which gives the results estimated to be more valid.

Concerning academic failure associated with other variables, the analysis carried out in **Table 10** revealed that age constitutes a factor in academic failure. OR: 1.09 (1.05 - 1.15). This could be explained by the fact that older students are those with more responsibility; at a time when this burden becomes more serious, older students permanently or temporarily abandon their studies. This result agrees with those of several previous studies stating that the students who succeed are a little younger than those who fail. Some authors had already observed a link between the age of obtaining the baccalaureate and university success and considered that students who had more difficulties in previous schooling had already repeated a year and were on average older [15].

Age is seen as a factor in dropping out of studies since primary school. Consider the study of (SOKHNA, 2006), it showed that the age of the student has a certain effect on the probability of dropping out. Thus, we can see that, all things being equal, the probability of dropping out of primary school is higher among children aged 15 to 17. Indeed, a girl who is 15 years old and who has still not completed primary school. This girl has a good chance of not completing the cycle because, on the one hand, she is in great demand for the domestic tasks that she must accomplish in addition to going to school and on the other hand, she may be a victim sexist stereotype.

Regarding having stress during exams, many studies have revealed a statistically significant association with academic failure. Some authors have tested the role of stress in academic success. Stressed subjects generally perform less well than non-stressed ones. Stressed individuals tend to doubt their abilities and develop emotional strategies in the face of adversity such as avoiding stressful situations, which would hinder their success in exams [16], a subject having a score N high (Neuroticism) is more vulnerable to stress than others. Since the first year of college is a stressful time, neuroticism should be detrimental to students' adjustment. Neuroticism has a very significant negative effect on academic performance (Chamorro-Premuzic and Burnham, 2003). For this study, there is an association between stress and academic failure, OR: 0.67 (0.45 - 1.04).

Paying study fees on time showed a statistical association with dropping out of studies, OR: 1.67 (1.04 - 2.50). Late payment of study fees would be an explanatory factor in academic failure. The student who has not paid the study fees on time experiences a lot of difficulties (at one point he is deprived of classes, questions, or even exams). These difficulties would cause the student to experience academic failure, including dropping out of studies. For some authors, students from a household headed by an executive or an employee have a high probability of continuing their studies, unlike their counterparts from households headed by an inactive or unemployed person [15].

Indeed, students of executives or employees have the advantage in their

studies to the extent that their parents have sufficiently regular income to finance the studies of their children over a fairly long period.

Living near campus indicates that students who do not live near campus have a greater risk of failing than those who live near campus, OR: 1.60 (1.00 - 2.56). The regression results also showed a statistically significant link between regularly arriving on time for classes and academic failure, OR: 1.72 (1.04 - 2.84). Living far from campus would be a predictive factor of academic failure. Students who live far from campus have great difficulty concentrating on academic activities. The difficulty of transportation caused by traffic jams, insufficient vehicles, insufficient money for transportation, are facts that could handicap the success of a student who lives far from campus.

Added to this is the late arrival of the student at home, excessive fatigue because very often the student arrives home around 8 p.m. and 9 p.m. and is unable to review his notes, but obliged to go out in the morning to go to classes with the difficulties mentioned above. These transport difficulties mean that some students often arrive late and miss certain parts of the lessons and the teachers' explanations. These results confirm those of [17], saying that students who succeed are a little more satisfied with their accommodation and their income than those who fail. We can see that being comfortable helps students work. This would be particularly important for university students, who spend a lot of time on personal work. This result is reminiscent of previous studies showing that the most successful students come from a privileged social background.

It was also shown that academic failure is significantly linked to regular reading of course notes before and during exams, OR: 1.86 (1.23 - 2.83). Here those who do not regularly read course notes are 86% more likely to fail than those who do so regularly. Regular reading allows the student to better assimilate the material and is more likely to respond better to assessments than those who do so irregularly. Eva Louvet and Yves Lender (2003) stipulate that students who fail are in fact approximately five times more likely to read less than five books per year; on the other hand, students who succeed are much more often avid readers. They add that students in a situation of failure are more or less unaware of the usefulness of reading as part of their studies and seem to experience writing as a constraint imposed by the education system [18].

On the other hand, for students who succeed, reading is more a source of pleasure than constraint; but what distinguishes them above all from students in a situation of failure is that they view writing as an essential tool for higher education, intimately linked to their status as students. Thus, internalizing the implicit requirements of higher education in terms of reading and personal work appears to be an essential factor for success at university. If someone does not give priority to studies it will be difficult for them to finish their studies, either they will leave studies permanently or change their major or even restart the academic year. It is also shown that when we increase one hour of reading per week we have a 3% chance of continuing in the same sector as someone who

does not read. These results are related to those of L. Pirot and J. M. DE KETELE (2000), concerning the quantitative aspects of substantive academic engagement outside of face-to-face, polytechnic students generally work more than psychology students. However, those who are most successful are those who work the most during the week and the most regularly. Successful psychology students work harder than those who fail. Sufficient and regular working time therefore seems to distinguish successful students from those who fail [19].

Regarding qualitative aspects, the overall study behaviors of students who have an in-depth understanding of the material. These students read the course materials, try to understand the material, identify its structure and check their understanding through application exercises. Students who fail are often poorly motivated, work too little, adopt too lackadaisical an approach and seem to place the most importance on planning, being up to date, having completed the work objectives set, being attentive to the amount of material covered. The most successful students are very attentive to planning and favor globalist study approaches. Those who fail spend a lot of time understanding the material and placing importance on memorization. These students are also those who work insufficiently and irregularly.

LAHIRE (1997) adds that among failing students, they say they read very poorly and rarely visit a library. If students with difficulties are therefore generally characterized by significantly less frequent reading practices, it is interesting to note that the only type of reading that they practice on a fairly regular basis (more often than students in a successful situation) concerns reading magazines. Thus these students use writing from a practical perspective [20].

From all of the above, we confirm the following hypotheses: individual factors constitute the determinants of academic failure, the analysis made in **Table 10** revealed that reading notes regularly is associated with academic failure, more we study less per week the more we have the risk of failing, the same goes for not giving priority to studies; social and environmental factors constitute the factors of academic failure, it has been shown that students who do not live near the campus have a greater risk of failing compared to those who live near it, those who do not arrive often on time for classes is a factor in academic failure; Economic factors have shown that students who do not pay tuition fees on time are more likely to fail.

## 5. Conclusion

This study found that older students, those who pay tuition fees late, those who live far from campus, students who regularly arrive late for classes, and those who do not regularly read course notes before and during exams constitute the explanatory factors of academic failure at the Higher Institute of Medical Techniques of Kinshasa. The construction of homes for students, the improvement of the socio-cultural and economic conditions of parents, the promotion of regular reading before and during evaluations prove essential for resolving the situation

of academic failure at ISTM-KIN.

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## Author Contributions

Antoine Dikoke Oleko Djamba the main author and designer of the research, Marie-Louise Ambokawa Nyidi, Patrick-Hilaire Woma Okolongo, Norbert-Daniel Lohohola Okitawongo, and Gilbert Dikete Akata, each as far as they are concerned participated in the contribution of this scientific work, either for the collection of data, or for the discussion and critical judgment in to make this work useful.

## Conflicts of Interest

With regard to this research, there is no conflict of interest between the authors.

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