

ORIGINAL ARTICLE

The impact of sociodemographic factors and family climate on the predominance of Internet addiction in Tiflet, Morocco

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ABSTRACT

Background: The increasing integration of the internet into daily life has raised numerous concerns, including the risk of addiction. This addiction may be influenced by sociodemographic factors.

Method: This is a cross-sectional study with an analytical aim, conducted at the Oued Eddahab High School in the city of Tiflet, Morocco. The study included 378 students (239 girls and 139 boys), with a mean age of 17.08 ± 1.28 years. Participants were asked to complete a sociodemographic questionnaire and the Internet Addiction Test (IAT).

Results: Among the 378 students surveyed, the prevalence of internet addiction was found to be 55.6% with 47.7% exhibiting moderate addiction and 8.2% displaying severe addiction. Conflicts with the mother were risk factors for severe Internet addiction (OR = 10.05; 95% CI = [2.56–39.34]; $p < 0.01$). Conflicts with the father (OR = 3.12; 95% CI = [0.87–11.10]; $p > 0.05$) and conflicts between parents (OR = 1.08; 95% CI = [0.32–3.61]; $p > 0.05$) were not risk factors for severe Internet addiction. Parental control of Internet access reduced the risk of severe Internet addiction (OR = 0.33; 95% CI = [0.14–0.76]; $p < 0.01$).

Conclusion: Students who experience conflicts with their parents (whether with the mother, father, or between both) are more likely to develop internet addiction. In contrast, parental supervision and control over internet use appears to reduce the risk of developing such an addiction. These results show the importance of prevention strategies that involve students, families, and educators. (www.actabiomedica.it)

Key words: addiction, internet, prevalence, sociodemographic factors.



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Introduction

The Internet has become a ubiquitous part of everyday life, offering a variety of resources and services. However, this increasing integration of the Internet into life has given rise to many concerns. All of this leads some people to spend the majority of their time online and to lose control over their ability to disconnect and control their impulses, which characterizes Internet addiction (1,2). The prevalence of internet addiction varies from one country to another; this prevalence was between 1.2% and 11.8% in European countries (3). In the United States the prevalence of internet addiction was 20.6% (4), while in Canada it was 18% (5). In Japan 23.7% of adolescents had an internet addiction (6). In Morocco one of the rare epidemiological studies carried out on a sample of adolescents in public places in the city of Casablanca by a self-questionnaire made it possible to determine that 40% of adolescents have problematic internet use and 8% are addicted (7). Internet addiction can be related to individual factors or family factors. As adolescents age, Internet addiction increases (8). The risk of Internet addiction in boys is higher than in girls, although the frequency of girls abusing the Internet is increasing (9). Adolescents with siblings have a higher risk of Internet addiction (10). Low paternal education leads to an increased prevalence of Internet addiction (11). High household income is a factor in Internet addiction (11, 12). Poor family structure is associated with an increased risk of Internet addiction (8, 13). Poor relationships between parents and their children cause Internet addiction among these adolescents (14). The prevalence data cited vary depending on the country and year, and on the methodology used in each study. Although several studies focus on the prevalence of Internet addiction, remaining issues deserve attention, first there is no data on the prevalence of Internet addiction among student in the city of Tiflet in Morocco, then given socio-demographic characteristics of the population, it is crucial to understand how these characteristics influence Internet addiction. Based on previous studies, it is assumed that sociodemographic factors and family environment may be associated with Internet addiction. The objective is to highlight the prevalence of Internet addiction and to examine its

relationship with sociodemographic factors and family climate among students in the city of Tiflet, Morocco.

Methods

Participants

Study involved 378 students (239 girls and 139 boys) aged 14 to 22 years, the mean age is $17.0.8 \pm 1.28$ years. All participants were students of the Oued Eddahab High School in the city of Tiflet, Morocco. Oued Eddahab High School is the largest school in the city of Tiflet, welcoming students from all neighborhoods in the city, which reflects the generalization of results to all adolescents in Tiflet. The sample size calculation is determined by Steven Thompson's equation:

$$n = \frac{(N \times p(1 - p))}{([N - 1 \times (d^2 \div z^2)] + p(1 - p))}$$

N: sample size; N: population size = 1958; d: risk of error = 0.05; p: probability = 0.5; z: Standard score for the significance level and confidence level of 95% = 1.96.

Digital application: $n = 321,28$.

Procedure

This is a cross-sectional study with an analytical aim. After obtaining the authorization of the head of the institution, Students who willingly consented to take part in the study were asked to fill out the questionnaire in person while attending physical education classes. The test and questionnaire took approximately 45 minutes to complete. Data collection took place between February and March 2024. Administering the questionnaires during physical education classes ensured high participation and minimized the pressure associated with academic assessment. In order to limit any pressure to participate and to guarantee confidentiality, students were informed that participation in the study was voluntary and anonymous, and physical education teachers did not participate in data collection.

Internet addiction

It's measured by the French version of the Internet Addiction Test (IAT) (2, 15). This is a 20-item test scored on a 5-point Likert scale (1: rarely, 5: always). The final score can range from 20 to 100 points. A score between 20 and 49 indicates the absence of internet addiction, a score between 50 and 79 reflects moderate addiction, and a score between 80 and 100 reflects severe internet addiction. The French version of the IAT was used because French is frequently used as the language of instruction at the secondary level in Morocco, making it easier for participants to understand the items, in addition, particular attention was paid to ensuring that items and instructions were understood, with explanations provided in advance where necessary, in order to limit bias related to linguistic or cultural differences. The IAT test showed good internal consistency with a Cronbach's alpha = 0.89.

Socio-demographic characteristics

Participants are asked to indicate their age, gender, educational level, monthly family income, marital status of parents, educational level of the father and mother, geographic origin (rural or urban) conflicts with mother or the father, conflicts between parents, and parental control of internet access. Family conflicts were assessed through self-reporting, which may expose the results to social desirability bias. However,

adolescents' subjective perception of family relationships is a relevant indicator, and anonymous conditions were put in place to limit the impact of this bias.

Statistical analysis

Quantitative results were represented by the mean \pm standard deviation, and qualitative results were represented by the number of samples (N) and percentage (%). The chi-square test was used to test the relationship between two qualitative variables. Multinomial logistic regression is used to predict a qualitative dependent variable with more than two modalities using qualitative or quantitative variables.

Results

The sociodemographic characteristics traits could apply to the person or their family. The findings in this section demonstrate how common Internet addiction is and how it is linked to a number of sociodemographic traits. Of the students who took part in this survey, 55.6% (95% CI: 50.4–60.6) were thought to be Internet addicts, with 47.7% (95% CI: 42.2–52.5) exhibiting moderate addiction and 8.2% (95% CI: 5.6–11.4) displaying severe addiction (Figure 1).

Female students were more dominant than male students. The first-year baccalaureate level is the most

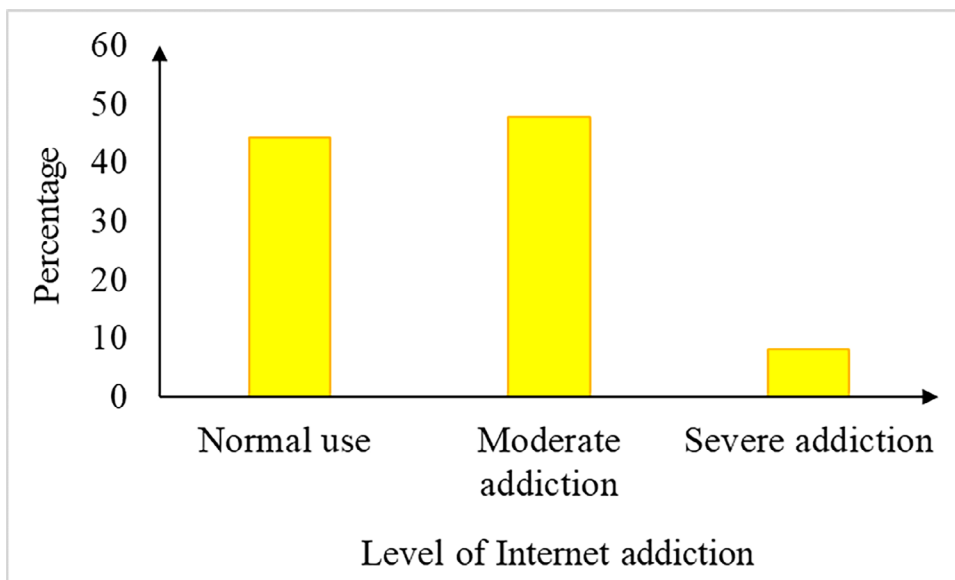


Figure 1. The sample distribution based on the degree of Internet addiction.

represented. Regarding financial resources, the proportion of participants with a regular monthly family income is dominant. The rate of participants whose parents live together being higher. The educational attainment of most students' fathers is either primary or secondary, with the remainder having an illiterate or higher education level. Concerning mothers, over half have an illiterate educational background, a rate that decreases as the education level increases. More than three-quarters of the participants are of urban origin. It is noteworthy that the majority of students report no conflicts with their father, nor their mother, nor between their parents. Finally, over half of the students' parents control their internet access, Table 1 illustrates these results.

Gender is not significantly correlated with internet addiction which indicates that there is no difference between boys and girls for internet addiction ($\chi^2 = 2.621$; $p > 0.05$). Internet addiction had no significant association with students' school level ($\chi^2 = 0.812$; $p > 0.05$), meaning that there was no difference between the core curriculum, first year of high school, and second year of high school in

terms of Internet addiction. Monthly family income was not associated with Internet addiction ($\chi^2 = 1.865$; $p > 0.05$), meaning that there was no difference between participants with regular income and participants with irregular income in terms of Internet addiction. The marital status of parents had no significant correlation with Internet addiction ($\chi^2 = 3.132$; $p > 0.05$), meaning that there was no difference between participants whose parents were separated and participants whose parents were together in terms of Internet addiction. Education level of the father had no significant correlation with Internet addiction ($\chi^2 = 1.655$; $p > 0.05$), nor did education level of the mother's ($\chi^2 = 11.582$; $p > 0.05$), meaning that there was no difference between participants whose parents had a low level of education and those whose parents had a high level of education. Geographic origin did not have a significant association with Internet addiction ($\chi^2 = 4.044$; $p > 0.05$), meaning that there is no difference between participants of rural origin and participants of urban origin in terms of Internet addiction. Table 2 displayed these findings.

Table 1. Sociodemographic characteristic and family climate of 378 high school student in city of Tiflet, Morocco, between February and March 2024.

Variables		N %	Variables		N %
Gender	Girl	239 (63.2%)	Mother's education level	Illiterate	196 (51,9%)
	Boy	139 (36.8%)		Primary	95 (25,1%)
School level	C.C	109 (28,8%)		Secondary	63 (16,7%)
	1 ^{ère} Bac	161 (42,6%)		Superior	24 (6,3%)
	2 ^{ème} Bac	108 (28,6%)	Geographical origin	Rural	90 (23,8%)
M.F.I	Regular	199 (52,6%)		Urban	288 (76,2%)
	Irregular	179 (47,4%)	Conflicts with their mothers	Yes	26 (6,9%)
M.S.P	Separated	37 (9,8%)		Non	352 (93,1%)
	Together	341 (90,2%)	Conflicts with their fathers	Yes	33 (9%)
Father's education level	Illiterate	82 (21,7%)		No	345 (91%)
	Primary	123 (32,5%)	C.B.P	Yes	45 (11,9%)
	Secondary	122 (32,3%)		No	333 (88,1%)
	Superior	51 (13,5%)	P.C.I.A	Yes	208 (55%)
		No		170 (45%)	

Abbreviations: N: number, %: percentage. C.C= Common core; M.F.I=monthly family income. M.S.P=Marital status of parents. C.B.P=Conflicts between parents. P.C.I.A = Parents' control of Internet access

Table 2. Impact of sociodemographic factor on Internet addiction among students in Tiflet, Morocco, during February and March 2024 (N = 378)

Variables	Internet addiction			χ^2	p-value
	Normal use	Moderate addiction	Severe addiction		
Gender				2,621	0,270
Girl	111	106	22		
Boy	57	73	9		
School level				0.812	0.937
Common core	49	53	7		
1ère Bac	70	77	14		
2ème Bac	49	49	10		
Monthly family income				1.865	0.393
Regular	82	99	18		
Irregular	86	80	13		
Marital status of parents				3.132	0.209
Separated	12	20	5		
Together	156	159	26		
Father's education level				1.655	0.949
Illiterate	37	41	4		
Primary	54	58	11		
Secondary	54	57	11		
Superior	23	23	5		
Mother's education level				11.582	0.072
Illiterate	87	97	12		
Primary	40	48	7		
Secondary	25	29	9		
Superior	16	5	3		
Geographical origin				4.044	0.132
Rural	47	39	4		
Urban	121	140	27		

Abbreviations: χ^2 : chi-square test.

Adolescents reporting conflicts with their mothers were 3.6 times more likely to have moderate Internet addiction (B = 1.29; OR = 3.65; 95% CI = [1.13–11.82]; p < 0.05) and 10 times more likely to have severe addiction (B = 2.3; OR = 10.05; 95% CI = [2.56–39.34]; p < 0.01). Conflicts with the father are not a significant risk factor for either moderate addiction (B = 0.5; OR = 1.43; 95% CI = [0.55–3.68]; p > 0.05) or severe addiction (B = 1.13; OR = 3.12; 95% CI = [0.87–11.10]; p > 0.05).

Conflicts between parents are not a risk factor for either moderate addiction (B = -0.45; OR = 0.63; 95% CI = [0.28–1.41]; p > 0.05) or severe addiction (B = 1.08; OR = 1.08; 95% CI = [0.32–3.61]; p > 0.05). Parental control of Internet access reduces the risk of moderate addiction by 40% (B = -0.5; OR = 0.60; 95% CI = [0.39–0.93]; p < 0.05) and the risk of severe addiction by 67% (B = -1.09; OR = 0.33; 95% CI = [0.14–0.76]; p < 0.01), Table 3 summarizes these results.

Table 3. Impact of family climate on Internet addiction among high school students in the city of Tiflet (Morocco) from February to March 2024 (N = 378).

Variables	Internet addiction							
	Moderate addiction				Severe addiction			
	B	OR	95% IC	p-value	B	OR	95% IC	p-value
C.W.T.M								
Yes	1.29	3.65	1.13-11.82	0.03	2.30	10.05	2.56-39.34	0.001
No	-	-	-	-	-	-	-	-
C.W.T.F								
Yes	0.35	1.43	0.55-3.68	0.458	1.13	3.12	0.87-11.10	0.079
No	-	-	-	-	-	-	-	-
C.B.P								
Yes	-0.45	0.63	0.28-1.41	0.266	0.08	1.08	0.32-3.61	0.891
No	-	-	-	-	-	-	-	-
P.C.I.A								
Yes	-0.5	0.60	0.39-0.93	0.024	-1.09	0.33	0.14-0.76	0.010
No	-	-	-	-	-	-	-	-

Abbreviations: C.W.T.M: Conflicts with their mothers; C.W.T.F: Conflicts with their fathers, C.B.P: Conflicts between parents; P.C.I.A = Parents' control of Internet access. The reference conditions are normal use of the internet, no conflict with their mother, no conflict with their father, no conflict between parents, no parental control of internet access. B = regression coefficient. OR= Odds Ratio

Discussion

While numerous studies have examined the prevalence of Internet addiction, certain gaps still require attention. Notably, no data currently exist on the prevalence of Internet addiction among adolescents in the city of Tiflet, Morocco. Moreover, considering the specific socio-demographic characteristics of this population, it is essential to explore how these factors may influence Internet addiction. In the present study, 55.6% of students were found to have internet addiction, this prevalence is unexpectedly high compared to prior Moroccan studies which found a prevalence of 15.80% (16). The prevalence reported in previous studies is based on the inclusion of severe addiction only, whereas in the present study, both severe and moderate addiction were included. These results are comparable to those of studies conducted in Malaysia, which has a prevalence of 56.4% (17), and Nepal, which is 51.10% (18), in Tunisia the prevalence of internet addiction was 43.9% (19), while in Jeddah, Saudi Arabia 68% of participants had mild to moderate levels of internet addiction (20). In Enugu, Nigeria 36.3% of participants

had a moderate level of internet addiction, while 2.1% had severe internet addiction (21). The variation in these prevalence rates may be attributed to differences in sampling techniques and thresholds criteria used by research to define internet addiction. There was no significant difference between girls and boys in terms of internet addiction, these results are consistent with a study in Jordan (22) even though their sample size is large and they used the t-test to compare the means of the Internet addiction test scores between girls and boys. The same applies to a study conducted in Tehran, Iran (23) whose sample size is larger, and they used the Chen Internet Addiction Questionnaire (CIAS) as a tool for measuring internet addiction. The lack of association between gender and Internet addiction may be due to the high number of girls participating in the study compared to boys or by the Moroccan sociocultural context, which is characterized by traditional social constraints that can limit certain outdoor activities, particularly for girls, which can lead to the use of the Internet as an alternative leisure activity, where girls and boys have similar access to various Internet content. There is no association between

academic level and Internet addiction; these results are consistent with a study conducted in Istanbul, Turkey (24). but a study in India shows opposite results (25). These results can be explained by the fact that, in the Moroccan sociocultural context, students had similar access to the Internet through the cultural integration of the Internet, regardless of their grade level. Monthly family income had no association with Internet addiction, these results are consistent with a study in Jordan (22) and Turkey (26). Even though the classification of monthly income is different, the results are consistent with international studies, this can be explained by the fact that in the Moroccan sociocultural and socioeconomic context, the structuring role of the family and social norms such as parental authority and supervision by the extended family (grandparents, uncles, aunts) tend to homogenize Internet use among adolescents regardless of their family's monthly income. The marital status of parents had no association with Internet addiction, these results are consistent with previous studies in southern China (27) and in Lublin, Poland (28). Even though the sample size is different, the results are similar to international studies, this may be due to several factors: the quality of interactions between parents and children may be more important than family structure, meaning that emotional support and open communication are essential whether a family is reunited or separated. In the Moroccan sociocultural context, children in separated families may benefit from the stability offered by another parent or other family members. Parents' level of education had no association with Internet addiction; these results are consistent with studies in Turkey (26) and China (29). Even though the sample size and the instrument used to measure internet addiction were different, the results were similar. These may be due to a much higher number of participants whose mothers were illiterate because of the former Moroccan sociocultural context, which was characterized by difficulties in girls' access to school. This leads to mothers being unaware of the risks of using the Internet, and fathers not sufficiently monitoring their children's online behavior, regardless of their level of education. Geographic origin had no association with Internet addiction; these results are consistent with studies in China (29, 30), these results may be due to a reduced number of participants from

rural areas or by the availability of the Internet which is now common even in less developed geographical areas, which leads to similar Internet usage between rural and urban areas. Conflicts with the mother are significant predictors of Internet addiction; these results are confirmed by previous studies (28, 31, 32). In the Moroccan sociocultural context, most mothers are homemakers, which makes them primarily responsible for organizing daily life, monitoring schoolwork, and supervising behavior at home, therefore, conflicts with the mother lead to excessive and repeated use of the Internet to escape the emotional imbalance felt in various areas of life, resulting in Internet addiction. Conflicts between students and their fathers were not a predictor of Internet addiction; these results are not consistent with previous studies in other countries (28, 31, 32), this difference characterizes the Moroccan sociocultural context, in which the father primarily plays an economic role that manifests itself in material security (housing, schooling, basic needs), This requires long working hours, leading to limited daily presence at home, this reduced availability limits interactions with children, thereby diminishing the psychological impact of conflicts, For this reason, conflicts with the father may be associated with Internet addiction, but in the multivariate model their effects were less significant than conflicts with the mother. Interparental conflicts are not direct predictors of Internet addiction, which means that these conflicts may have an effect, as shown in previous studies (31, 33-36), but in the multivariate model, conflicts between parents are absorbed by conflicts between adolescents and their mothers, on the other hand, in the Moroccan sociocultural context, the family is not limited to the parental nucleus, in addition to parents, children or adolescents live with grandparents, uncles, and aunts, which can reduce the impact of conflicts and consequently limit excessive use of the Internet as a means of avoidance. Parental control of Internet access plays a protective role against Internet addiction, this effect is consistent with the literature review (30, 37). These results were confirmed by the theory of parental mediation through these three forms: active mediation, where parents discuss with their children what they watch and what they do, restrictive mediation, where parents set rules about screen time and what content is allowed or not

allowed, and finally, the co-neighborhood where parents watch or use media with their children. A previous study shows that parental mediation reduces the risk of internet addiction (38). The associations observed do not allow a causal relationship to be established, and the links between family conflicts and Internet addiction may be bidirectional.

Conclusion

This study shed light on the prevalence of Internet addiction among high school student in the city of Tiflet, Morocco, as well as its association with various socio-demographic characteristics. Internet addiction affects a very remarkable proportion of adolescents resulting from conflicts with parents and inter-parental conflicts, while other factors have no effect. It is necessary to implement prevention programs in schools that involve students, families, and educators, as well as strengthening parental mediation. These results open up a path for a longitudinal study to assess the impact of prevention measures over time.

Ethic approval: The research protocol for this study complies with the rigorous ethical standards established in the Helsinki Declaration, and all participants provided informed consent to participate after being apprised of the study's objective and procedures.

Conflict of interest: Each author declares that he or she has no commercial associations (e.g. consultancies, stock ownership, equity interest, patent/licensing arrangement etc.) that might pose a conflict of interest in connection with the submitted article.

Authors contribution: This work was carried out in collaboration between all authors. All authors took participation in the design of the study. Authors M.R, A.C.L and M.E have equally contributed to manage the literature searches, perform the statistical analysis, and write the first draft of the manuscript. Author S.B proofread the methodology and statistical results. Author F-Z.A revised the manuscript. All authors read and approved the final manuscript.

Declaration on the use of AI: We used artificial intelligence just to improve the language and grammar.

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