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## The role of parents' and friends' support in preventing suicide attempts among French sexual minority adolescents



*Le rôle du soutien parental et soutien amical dans la prévention de tentatives de suicide chez les adolescents français de minorités sexuelles*

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### INFO ARTICLE

Historique de l'article :

Reçu le 20 avril 2022

Accepté le 14 février 2023

Disponible sur Internet le xxx

Keywords :

Adolescents

Friends' support

Parental support

Sexual minority

Suicide attempt

Mots-clés :

Adolescents

soutien amical

soutien parental

minorité sexuelle

tentative de suicide

### ABSTRACT

**Objectives.** – French sexual minority adolescents are at higher risk for suicide attempts than their heterosexual peers. However, little is known about the role of parents' and friends' support among French lesbian, gay and bisexual (LGB) youth. This study aimed to research the role of their support in preventing suicide attempts among LGB adolescents in France.

**Materials and Methods.** – Data were drawn from a French cross-sectional study entitled “Portraits d'adolescents”. Parental support was defined by satisfactory relations between participants and their parents. Friends' support was defined by satisfactory relations between participants and their friends. Chi-square and multiple logistic regression analyses were used to estimate and identify associated factors of suicide attempts in LGB as opposed to heterosexual youth.

**Results.** – Data from a sample of 14,265 French adolescents aged 13 to 20 were analyzed. Among them, 637 (4.47%) identified as LGB. Attempted suicide was independently associated with sexual orientation (30.7% vs 10.6%; OR = 2.59 [2.11–3.18];  $p < 0.0001$ ). Both parents' and friends' support appeared to be protective factors in suicide attempts among heterosexuals (adjusted ORs = 0.40 [0.35–0.46] and 0.61 [0.51–0.75], respectively), whereas in the LGB group, only parental support was significant (adjusted OR = 0.42 [0.27–0.65]), independently of other variables.

**Discussion.** – Prevention efforts might be carried out by identifying within-group differences among French adolescents with different sexual orientations. The supportive role of family members should be strengthened. Positive resources and salutary support systems may effectively prevent suicide attempts.

**Conclusions.** – French LGB adolescents have a higher risk for suicide attempts than their heterosexual peers. Parental support was reconfirmed as a major protective factor against suicide attempts in sexual minority adolescents.

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### RÉSUMÉ

**Objectifs.** – Les adolescents français de minorités sexuelles présentent un risque suicidaire plus élevé que leurs pairs hétérosexuels. Cependant, le rôle des soutiens parental et amical chez les jeunes français ayant une attirance homosexuelle et/ou bisexuelle (LGB) a été peu exploré dans la littérature. Le but de cette étude était de rechercher le rôle du soutien des parents et des amis dans la prévention des tentatives de suicide chez les adolescents LGB en France.

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**Matériels et méthodes.** – L'enquête française « Portraits d'adolescents », réalisée en 2013, apporte des données sur de nombreuses variables dont l'attraction sexuelle et les tentatives de suicide. Le soutien parental a été défini par la satisfaction des relations entre les participants et leurs parents. Le soutien amical a été défini par la satisfaction des relations entre les participants et leurs amis. Différents types de méthodes statistiques (test du Chi 2, modèle de régression logistique) ont été réalisés pour comparer les groupes LGB et hétérosexuels et identifier les facteurs de risque ou de protection de tentatives de suicide.

**Résultats.** – Les données d'un échantillon de 14 265 adolescents français âgés de 13 à 20 ans ont été analysées. Parmi eux, 637 (4,5 %) se décrivent comme LGB. 30,7 % rapportent avoir fait une tentative de suicide (vs 10,6 % des adolescents hétérosexuels ; OR = 2,59 [2,11–3,18] ;  $p < 0,0001$ ). Les soutiens parental et amical apparaissent comme des facteurs de protection des tentatives de suicide chez les hétérosexuels (OR ajustés = 0,40 [0,35–0,46] et 0,61 [0,51–0,75] respectivement), alors que seul le soutien parental est significatif chez les jeunes homosexuels (OR ajusté = 0,42 [0,27–0,65]), indépendamment des autres variables.

**Discussion.** – Les efforts de prévention pourraient être réalisés en identifiant les différences intra-groupes parmi les adolescents français ayant des orientations sexuelles différentes. Le rôle de soutien des membres de la famille doit être renforcé. Des ressources positives et des systèmes de soutien sains peuvent littéralement être la prévention efficace des tentatives de suicide.

**Conclusions.** – Les adolescents français LGB ont un risque plus élevé de tentatives de suicide que leurs pairs hétérosexuels. Le soutien parental a été reconfirmé comme un facteur de protection important contre les tentatives de suicide chez les adolescents de minorités sexuelles.

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## 1. Introduction

Suicide accounts for 1.4 % of all deaths worldwide, making it the 18<sup>th</sup> leading cause of death [1]. Suicide occurs across age ranges and is globally the second leading cause of death among 15–29-year-olds [2]. The definition of a suicide attempt is “Potentially self-injurious behavior with a nonfatal outcome, for which there is evidence (either implicit or explicit) that the person intended at some (nonzero) level to kill himself/herself” [3]. According to the European School Survey Project on Alcohol and Other Drugs (ESPAD) in France, 9.5 % of high school students have made at least one suicide attempt in their lives. Almost 3 % of adolescents aged 17 have reported suicide attempts leading to hospitalization [4]. Moreover, sexual minority adolescents present a higher risk of suicide attempts [5–7]. Adolescents who identify as lesbian, gay, and bisexual (LGB) are at least three times more likely to have attempted suicide than their heterosexual peers [8–10].

Given the high proportion of suicide attempts among sexual minority adolescents, the identification of protective factors should be a priority. Previous studies have identified and targeted protective factors: family connectedness, parental acceptance, caring by a teacher or another adult, and school safety [11–13]. Among these results, parental support and friends' support are considered to be primordial ; For example, studies by Green et al. and Mutumba et al. revealed that both family acceptance and peer friendship are of crucial importance in preventing suicide attempts in LGB youth [11,14]. That said, self-anxiety and social pressure due to sexual orientation can lead to social bullying and isolation among LGB adolescents, who have been shown to be more suicidal than their heterosexual peers. On the other hand, friends' support has been associated with improved mental health outcomes in American sexual minority students, which means that it could indirectly decrease suicide attempts [15–17]. Conversely, another study revealed that social marginalization of LGB adolescents by both peers and family may increase suicide attempts [18]. However, most of the published research on suicidality and sexual minority status among adolescents are has been carried out in the United States. Given that France, as well, is a western nation, it could be useful to highlight the differences in French society's attitudes toward and treatment of sexual minority individuals compared to the US, particularly with regard to the differing impacts of parents' and friends' support on suicidality on LGB adolescents and their heterosexual peers.

In addition, several studies have reported different risk factors associated with suicide attempts in sexual minority adolescents, including depression [19–21], hopelessness [20,22], substance

consumption [23], and recent suicide history of family members or close friends [6,24]. Considering that protective and risk factors always co-occur and interact [25], identification of the latter should be attempted.

Based on the previous research results, two hypotheses were tested in this study: 1) French sexual minority adolescents present higher rates of suicide attempts than their heterosexual peers. 2) Parents' and friends' support may have protective effects on suicide attempts, and differences could be found between LGB adolescents and their heterosexual peers. The present study aims to 1) compare the prevalence of suicide attempts among LGB and heterosexual adolescents in France, and 2) confirm the role of parents' and friends' support as protective factors among French LGB adolescents.

## 2. Methods

### 2.1. Sample and data collection

A school-based population survey, “Portraits of Adolescents : Multicentric Epidemiological Survey in Schools in 2013” was conducted in France [26]. Design and implementation of the survey were performed by the *Institut national de la santé et de la recherche médicale* (INSERM) and other experts. An anonymous questionnaire containing 348 questions was used to collect the data. Subjects were selected from three different areas in France: Hautes-Alpes (semi-urban district), Val de Marne (urban district), and the Poitou-Charentes region (rural area). An information letter with details of the survey was sent to adult students and parents of minor students (< 18 years old). Finally, a total of 134 schools and 730 classes participated in the survey. This study received a favorable opinion from the National Ethics Advisory Committee and was carried out under the conditions of confidentiality stipulated by the CNIL (*Commission Nationale de l'Informatique et des Libertés*) (Protocol n°912523).

### 2.2. Participants

A total of 15,235 participants aged from 13 to 20 years were included and divided by sexual orientation into two groups (LGB and heterosexual).

### 2.3. Measurements

#### 2.3.1. Sexual orientations

In this study, the heterosexual group refers to students who had an attraction to members of the opposite sex. The LGB group refers to

students who had an attraction to those of the same sex or both sexes.

### 2.3.2. Suicide attempts

A history of previous suicide attempts was evaluated by the question "During your lifetime, have you attempted suicide?" The adolescents who responded "once" or "several" times were defined as having a history of suicide attempts.

### 2.3.3. Support

For parental support, the question "Generally, how satisfied are you with your relationship with your father/mother?" was asked. Those who answered "very satisfied" and "satisfied" were classified as having parental support, whereas those who answered "neither satisfied nor dissatisfied", "not very satisfied" or "not satisfied at all" were classified as without parental support.

For friends' support, the question "how satisfied are you with your relationships with your friends?" was asked. The adolescents who responded "very satisfied" and "satisfied" were classified as having friends' support. "Neither satisfied nor dissatisfied", "not very satisfied", or "not satisfied at all" were classified as without friends' support.

### 2.3.4. Other variables

According to the previous studies due to their potential associations with suicide attempts, the following factors were included in the study [15,20,27]. First, demographic status was evaluated by age, self-reported biological sex, and region (urban, semi-urban or rural areas). Second, the family context was assessed via questions relating to parents' unemployment, parental separation, and the loss of at least one parent. Third, school education was assessed via school level or failure to proceed to the next grade. Lastly, we included confirmed risk factors: substance consumption, mental health, and dangerous activities. Substance consumption was evaluated as follows: smoking intensively (at least ten cigarettes per day), drinking regularly (at least 10 times during the last 30 days), regular use of cannabis (consumption 10 times during the last 30 days), and use of other drugs (amphetamine, inhaler, ecstasy, lysergic acid diethylamide [LSD], crack, cocaine, heroin, hallucinogenic mushroom or methylenedioxyamphetamine [MDMA]). Mental health and other activities were examined by: participation in dangerous games, experiencing self-harm, and considering adolescence as a difficult period, while depression was measured by the ADRS scale (Adolescent Depression Rating Scale), which was divided into 3 levels (No depression: score < 3; Sub-depression: 3 < score < 5; Depression: score ≥ 6/10) to calculate the adolescents' depression score [28].

## 2.4. Statistical Analysis

First, descriptive analysis was performed to explore participants' demographic information of. Second, bivariate analysis (chi-square) was conducted to determine the statistical extent of differences between self-reported suicide and non-suicide attempters in the entire sample, LGB and heterosexual subgroups. Third, multivariate logistic regression was performed to examine the protective effects of parents' and friends' support based on a data and further on the data subsets among the LGB and the heterosexual subjects. All tests were two-tailed. The significance level was set at 0.05. Statistical analyses were performed using R (Version 4.1.0).

## 3. Results

Demographic information is summarized in Table 1: data from a sample of 14,265 adolescents were analyzed, and 52.2 % were female. Among the total sample, 13,628 were heterosexual (95.5 %), and 637 were LGB (4.5 %). All in all, 11.5 % of participants reported at least one

past suicide attempt, 88.7 % reported that they had more than five friends, 31.6 % reported failure to proceed to the next grade, 12.2 % had depression, 21.4 % smoked intensively, 9.1 % drank regularly, 19.9 % regularly consumed cannabis, and 12.1 % consumed other drugs. 62.2 % reported having parental support, and 55.6 % had friends' support.

### 3.1. Bivariate analyses

Reported suicide attempts were more frequent in LGB adolescents than in their heterosexual peers (30.7 % vs. 10.6 %). Suicide attempts among LGB vs. heterosexual adolescents are detailed in Table 2. Parental support was significant in both LGB and heterosexual adolescents ( $p < 0.0001$ ). However, friends' support did not reach significance in the LGB group ( $p > 0.05$ ). Heterosexual youth showed a significantly greater likelihood of drinking regularly, while LGB youth were significantly more likely to consume cannabis regularly. All of the mental health factors showed significance ( $p < 0.005$ ) in both LGB and heterosexual groups. The factor "considering adolescence as a difficult period" reached significance in the heterosexual group only ( $p < 0.0001$ ).

### 3.2. Multivariate analyses

Multiple logistic regression analysis was used to examine the protective effects of parental support and friends' support. The mental health and substance consumption factors were not included in the models because they appeared to mediate the association between social support and suicide attempts [12,29]. As shown in Table 3, analysis was performed in the entire sample and in two subgroups (LGB and heterosexual). For the entire sample, parental support and friends' support were identified as protective factors against suicide attempts. Several risk factors were found to be significant, including sex (female), sexual orientation (LGB), age (more risks for younger individuals), region (rural area), failure to proceed to the next grade, loss of at least one parent, parental separation, participation in dangerous games, and considering adolescence as a difficult period. In subgroup analysis, parental support (OR = 0.42 [0.27–0.65]) was found to be a protective factor for LGB adolescents. Among heterosexual adolescents, both parental support (OR = 0.40 [0.35–0.46]) and friends' support (OR = 0.61 [0.51–0.75]) were considered as protective factors.

## 4. Discussion

This current cross-sectional study is a pioneering analysis of the impact of parental and friends' support on suicide attempts among LGB adolescents in France. Suicide attempts were found to be associated with sexual orientation, a finding consistent with previous studies [10,11]. A co-twin control study in youth males showed that suicide attempts remained significantly associated with same-sex sexual attraction after adjustment for substance abuse and depressive symptoms [30]. However, the proportion of suicide attempts among LGB adolescents in our study is higher than in other French studies, and we believe the reason could be that the other studies used a biased sampling method (snowball sampling) or involved only the youth who were willing to participate in the investigation, which would have led to unrepresentative samples [4,8].

Among various supports, parental support is identified in many studies [13,31] as being of prime importance in improving sexual minority students' well-being. Our result showed that independent from other variables, only parental support was associated in the LGB group with suicide attempts Markham and her coauthors [32] reported that positive parenting practices could help sexual minority students to ease stress and lower the risk of maladaptive health status. More specifically, a lower percentage of suicide attempts among

**Table 1**  
Description of demographics in different groups.

Variables	Total n = 14265		LGB n = 637		Heterosexual n = 13628		p
	n	%	n	%	n	%	
<i>Sociodemographics</i>							
Sex (N=14265)							<.0001
Female	7444	52.2	455	71.4	6989	51.3	
Male	6821	47.8	182	28.6	6639	48.7	
Age (N = 14265)							<.0001
13–14	4273	29.9	123	19.3	4150	30.4	
15–16	5959	41.8	268	42.1	5691	41.8	
17–18	3670	25.7	223	35.0	3447	25.3	
19–20	363	2.6	23	3.6	340	2.5	
Region (N =14265)							<.01
urban	3822	26.8	167	26.2	3655	26.8	
semi-urban	6625	46.4	266	41.8	6359	46.7	
rural area	3818	26.8	204	32.0	3614	26.5	
<i>School</i>							
Level of school (N = 14265)							<.001
Middle	4917	34.5	146	22.9	4771	35.0	
High	9348	65.5	491	77.1	8857	65.0	
Failure to proceed to the next grade (N = 14241)							<.001
Yes	4502	31.6	239	37.6	4263	31.3	
No	9739	68.4	397	62.4	9342	68.7	
<i>Parents</i>							
Professional activity of father (N = 13789)							<.01
No	2067	15.0	117	19.4	1950	14.8	
Yes	11722	85.0	494	80.6	11228	85.2	
Professional activity of mother (N = 14009)							<.01
No	2534	18.1	139	22.4	2395	17.9	
Yes	11475	81.9	482	77.6	10993	82.1	
Loss of at least one parent (N = 13855)							<.01
Yes	676	4.9	47	7.6	629	4.8	
No	13179	95.1	575	92.4	12604	95.2	
Parental separation (N = 13641)							<.0001
Yes	4717	34.6	273	44.8	4444	34.1	
No	8924	65.4	336	55.2	8588	65.9	
<i>Substance consumptions</i>							
Smoking intensively (N = 14238)							<.0001
Yes	648	4.6	77	12.1	571	4.2	
No	13590	95.4	558	87.9	13032	95.8	
Drinking regularly (N = 13606)							<.001
Yes	1242	9.1	79	13	1163	8.9	
No	12364	90.9	530	87	11834	91.1	
Consuming cannabis regularly (N = 13697)							<.0001
Yes	2733	19.9	204	33.3	2529	19.3	
No	10964	80.1	408	66.7	10556	80.7	
Other drug consumption (N=14112)							<.0001
Yes	1706	12.1	177	28.1	1529	11.3	
No	12406	87.9	454	71.9	11952	88.7	
<i>Mental Health and other activities</i>							
Considering adolescence as a difficult period (N = 14166)							<.0001
Yes	11950	84.4	570	90.3	11380	84.1	
No	2216	15.6	61	9.7	2155	15.9	
Experience of self- harm (N = 14193)							<.0001
Yes	1304	9.2	161	25.6	1143	8.4	
No	12889	90.8	468	74.4	12421	91.6	
Participating in dangerous games (N = 14191)							<.0001
Yes	1326	9.3	96	15.2	1230	9.1	
No	12865	90.7	534	84.8	12331	90.9	
Depression (N = 13821)							<.0001
Yes	1681	12.2	162	26.4	1519	11.5	
No	12140	87.8	451	73.6	11689	88.5	
Suicide attempt (N = 14121)							<.0001
Yes	1625	11.5	194	30.7	1431	10.6	
No	12496	88.5	438	69.3	12058	89.4	
<i>Support</i>							
Parental support (N = 13516)							<.0001
No	5103	37.8	351	58.3	4752	36.8	
Yes	8413	62.2	251	41.7	8162	63.2	
Friends' support (N = 13802)							.51
No	6130	44.4	283	45.8	5847	44.3	
Yes	7672	55.6	335	54.2	7337	55.7	
Number of friends (N = 14117)							<.0001
0–4	1599	11.3	131	20.7	1468	10.9	
> 5	12518	88.7	501	79.3	12017	89.1	

**Table 2**  
Bivariate analysis between characteristics and suicide attempts in the whole sample, LGB and heterosexuals.

Variables	Total (n = 14265) N = 14607			LGB (n = 637) N = 637			Heterosexual (n = 13628) N = 13628		
	No (%)	Yes (%)	p	No (%)	Yes (%)	p	No (%)	Yes (%)	p
<b>Sociodemographics</b>									
Gender			<.0001			.47			<.0001
Male	6269 (93.1)	463 (6.9)		129 (71.7)	51 (28.3)		6140 (93.7)	412 (6.3)	
female	6227 (84.3)	1162 (15.7)		309 (68.4)	143 (31.6)		5918 (85.3)	1019 (14.7)	
Age			.01			.23			<.0001
13–14	3747 (89)	461 (11)		81 (65.9)	42 (34.1)		3666 (89.7)	419 (10.3)	
15–16	5218 (88.4)	688 (11.6)		181 (68.6)	83 (31.4)		5037 (89.3)	605 (10.7)	
17–18	3233 (88.6)	416 (11.4)		163 (73.4)	59 (26.6)		3070 (89.6)	357 (10.4)	
19–20	298 (83.2)	60 (16.8)		13 (56.5)	10 (43.5)		285 (85.1)	50 (14.9)	
Region			<.0001			<.01			<.0001
Urban	3401 (90.5)	358 (9.5)		121 (74.2)	42 (25.8)		3280 (91.2)	316 (8.8)	
Semi-urban	5907 (89.9)	661 (10.1)		193 (72.6)	73 (27.4)		5714 (90.7)	588 (9.3)	
Rural area	3188 (84.1)	606 (15.9)		124 (61.1)	79 (38.9)		3064 (85.3)	527 (14.7)	
<b>Parents</b>									
Professional activity of father			<.0001			.17			<.0001
No	10394 (89.5)	1226 (10.5)		346 (70.8)	143 (29.2)		10048 (96.2)	1083 (9.7)	
Yes	2102 (84.0)	399 (16.0)		92 (64.3)	51 (35.7)		2010 (85.2)	348 (14.8)	
Professional activity of mother			<.0001			.09			<.0001
No	10176 (89.4)	1210 (10.6)		341 (71.2)	138 (28.8)		9835 (90.2)	1072 (9.8)	
Yes	2320 (85.1)	415 (14.9)		97 (63.4)	56 (36.6)		2223 (86.1)	359 (13.9)	
Loss of at least one parent			<.0001			<.05			<.0001
Yes	528 (79.5)	136 (20.5)		25 (53.2)	22 (46.8)		503 (81.5)	114 (18.5)	
No	11627 (89)	1442 (11)		403 (70.7)	167 (29.3)		11224 (89.8)	1275 (10.2)	
Parental separation			<.0001			1			<.0001
Yes	3951 (84.5)	724 (15.5)		188 (69.4)	83 (30.6)		3763 (85.4)	641 (14.6)	
No	8013 (90.6)	832 (9.4)		231 (69.4)	102 (30.6)		7782 (91.4)	730 (8.6)	
<b>School</b>									
Level of school			.14			.24			<.05
Middle	4254 (87.9)	584 (12.1)		95 (65.1)	51 (34.9)		4159 (88.6)	533 (11.4)	
High	8242 (88.8)	1041 (11.2)		343 (70.6)	143 (29.4)		7899 (89.8)	898 (10.2)	
Failure to proceed to the next grade			<.0001			<.001			<.0001
No	8765 (90.7)	898 (9.3)		292 (74.3)	101 (25.7)		8473 (91.4)	797 (8.6)	
Yes	3714 (83.8)	724 (16.2)		145 (60.9)	93 (39.1)		3569 (85)	631 (15)	
<b>Substance consumptions</b>									
Smoking intensively			<.0001			<.0001			<.0001
Yes	448 (69.6)	196 (30.4)		30 (39.5)	46 (60.5)		418 (73.6)	150 (26.4)	
No	12027 (89.4)	1425 (10.6)		407 (73.5)	147 (26.5)		11620 (90.1)	1278 (9.9)	
Drinking regularly			<.0001			<.001			<.01
Yes	1042 (84.4)	192 (15.6)		41 (51.9)	38 (48.1)		1001 (86.7)	154 (13.3)	
No	10878 (88.8)	1367 (11.2)		379 (72.2)	146 (27.8)		10499 (89.6)	1221 (10.4)	
Consuming cannabis regularly			<.0001			<.01			<.0001
Yes	786 (79.6)	201 (20.4)		44 (55.7)	35 (44.3)		742 (81.7)	166 (18.3)	
No	11223 (89.2)	1358 (10.8)		378 (71.5)	151 (28.5)		10845 (90)	1207 (10)	
Other drug consumption			<.0001			<.0001			<.0001
Yes	1242 (73.1)	456 (26.9)		84 (47.7)	92 (52.3)		1158 (76.1)	364 (23.9)	
No	11131 (90.7)	1148 (9.3)		349 (77.6)	101 (22.4)		10782 (91.1)	1047 (8.9)	
<b>Mental Health and other activities</b>									
Considering adolescence as a difficult period			<.0001			.83			<.0001
No	10400 (87.6)	1466 (12.4)		394 (69.4)	174 (30.6)		10006 (88.6)	1292 (11.4)	
Yes	2042 (93.3)	147 (6.7)		43 (71.7)	17 (28.3)		1999 (93.9)	130 (6.1)	
Participating in dangerous games			<.0001			<.0001			<.0001
Yes	983 (75.2)	324 (24.8)		36 (37.5)	60 (62.5)		947 (78.2)	264 (21.8)	
No	11450 (89.9)	1293 (10.1)		396 (74.9)	133 (25.1)		11054 (90.5)	1160 (9.5)	
Depression			<.0001			<.0001			<.0001
Yes	1107 (66.3)	562 (33.7)		73 (45.3)	88 (54.7)		1034 (68.6)	474 (31.4)	
No	11030 (91.7)	1004 (8.3)		351 (78.2)	98 (21.8)		10679 (92.2)	906 (7.8)	
<b>Support</b>									
Parental support			<.0001			<.0001			<.0001
No	4089 (80.8)	973 (19.2)		218 (62.5)	131 (37.5)		3871 (82.1)	842 (17.9)	
Yes	7799 (93.4)	551 (6.6)		196 (78.7)	53 (21.3)		7603 (93.9)	498 (6.1)	
Friends' support			<.0001			.08			<.0001
No	845 (80.2)	208 (19.8)		51 (60.7)	33 (39.3)		794 (81.9)	175 (18.1)	
Yes	11433 (89.1)	1392 (10.9)		382 (70.9)	157 (29.1)		11051 (89.9)	1235 (10.1)	

sexual minority youth has been shown among individuals with vital family connectedness, and parental connectedness has more impact on attempted suicide than other protective factors (e.g., school connectedness) [33]. On the other hand, family stress is significantly associated with suicide attempts [12,34,35]. Sexual minority students who experienced higher rates of family rejection were more likely to

report poorer health outcomes: over eight times more likely to attempt suicide, nearly six times more likely to have depression, and over three times more likely to consume illegal drugs compared to those with a low level of family rejection [36]. In France, some studies have reported that family discord and antagonistic relationship with parents were associated with increased suicide risk in French

**Table 3**  
Logistic Regression models of suicide attempts.

Variable	Total (n = 14265)		LGB (n = 637)		Heterosexual (n = 13628)	
	OR [95 %CI]	p	OR [95 %CI]	p	OR [95 %CI]	p
Sexual orientation	2.59 [2.11–3.18]	<.0001				
Sociodemographics						
Gender	2.43 [2.13–2.79]	<.0001	1.09 [0.69–1.73]	.73	2.59 [2.54–2.99]	<.0001
Age 15–16 [ref]	1		1		1	
13–14	1.25 [0.96–1.63]	.1	2.20 [0.86–5.67]	.1	1.21 [0.92–1.59]	.19
17–18	0.77 [0.66–0.90]	<.001	0.59 [0.35–0.97]	<.05	0.79 [0.67–0.94]	<.01
19–20	0.78 [0.54–1.10]	.16	0.37 [0.11–1.20]	.11	0.83 [0.57–1.18]	.31
Region Urban [ref]	1		1		1	
Semi-urban	1.18 [1.01–1.37]	<.05	1.01 [0.60–1.74]	.96	1.18 [1.01–1.39]	<.05
Rural area	1.78 [1.50–2.11]	<.0001	2.23 [1.25–4.02]	<.01	1.75 [1.47–2.09]	<.0001
Parents						
Professional activity of father	1.11 [0.95–1.29]	.19	1.41 [0.84–2.35]	.19	1.08 [0.96–1.27]	.36
Professional activity of mother	1.11 [0.96–1.28]	.16	0.96 [0.58–1.57]	.87	1.11 [0.96–1.29]	.17
Loss of at least one parent	1.74 [1.26–2.38]	<.001	4.02 [1.35–12.92]	<.05	1.58 [1.11–2.21]	<.01
Parental separation	1.18 [1.04–1.33]	<.05	0.74 [0.48–1.12]	.16	1.24 [1.08–1.41]	<.01
School						
Level of school	0.96 [0.75–1.24]	.77	1.66 [0.69–4.09]	.26	0.92 [0.71–1.20]	.54
Failure to proceed to the next grade	1.72 [1.48–1.98]	<.0001	1.82 [1.12–2.98]	<.05	1.71 [1.47–1.99]	<.0001
Other activities						
Considering adolescence as a difficult period	1.37 [1.12–1.67]	<.01	1.54 [0.74–3.57]	.27	1.37 [1.12–1.69]	<.01
Participating in dangerous games	3.22 [2.72–3.82]	<.0001	5.34 [3.11–9.34]	<.0001	3.10 [2.59–3.71]	<.0001
Support						
Parental support	0.41 [0.36–0.46]	<.0001	0.42 [0.27–0.65]	<.001	0.40 [0.35–0.46]	<.0001
Friends' support	0.62 [0.52–0.75]	<.0001	0.78 [0.44–1.41]	.41	0.61 [0.51–0.75]	<.0001

adolescents [37]. This is consistent with our findings showing that losing of at least one parent is a risk factor for suicide attempts. Psychiatrists and psychologists have confirmed that a multitude of family configurations (single-parent, recomposed, extended...) or family instability (divorces, separations...) exacerbate suicide attempts among youth [37,38]. Conversely, family as a structured and reassuring “emotional niche” should allow a child and an adolescent to confidently develop and grow, with a reduced risk of suicide [39].

Aside from parental support, peer relationships help to improve sexual minority adolescents' mental health, as parents may have difficulties being confident in their children's sexuality, whereas peers could act as essential models [6,12]. It has been hypothesized that the best support givers are people who have successfully overcome the same or similar stressful situations, and this study found that both number of friends and friends' support are lower in LGB adolescents than in their heterosexual peers [40]. One possible reason may be that sexual minority individuals are at increased risk of victimization [41], making it difficult to meet and make friends with peers with the same sexual orientations. Unfortunately, our study did not identify friends' support as a protective factor among LGB adolescents. The reason may be that we have not distinguished the friends from the Internet from those encountered in real-life situations, given the prevalence nowadays of online dating among sexual minority youth [42,43].

This study has notable policy implications, especially in France, even though it does not cover all regions of the country. First, it could provide precise focus on sexual minority youth health disparities. Second, prevention efforts might be furthered by identifying within-group differences among French adolescents with different sexual orientations. Third, the supportive role of family members could be strengthened. If knowledge of coming out, sexual orientation, and gender identity were better disseminated among family members, suicide attempts of sexual minority children might decrease. For LGB youth who have unsupportive families or evolve in an unsupportive environment, positive resources and salutary support systems may effectively prevent suicide attempts.

This study has some limitations. First, suicide attempts were measured in terms of only one item. It does not suffice to specify the frequency of suicide attempts and the circumstances under which these behaviors occurred. Second, the measurement of parental support and friend's support is a limitation insofar as it fails to consider specific support/acceptance concerning sexual orientation. Third, we did not have any data about other factors related to suicide attempts: childhood adversity, sexual victimization, bullying...), which could also be meaningfully related to the impact of parents' support and friends' support in preventing suicide attempts. Fourth, we did not collect data on race/ethnicity, which ethics committees in France do not recommend ; it seems to be an important factor in some studies [44]. Finally, we did not separate bisexual and homosexual adolescents because the sample was too small for the to be analyzed separately.

### 5. Conclusion

French sexual minority adolescents are at significantly higher risk of suicide attempts than their heterosexual peers. Parental support has been confirmed as an influential and effective protective factor that should be systematically sought out as a means of preventing suicide attempts among LGB adolescents. Based on this study, further research should focus on the longitudinal investigation to better explain the causal relationship between suicide attempts and related factors.

### Funding

The authors declare that no funds, grants, or other support were received during the preparation of this manuscript.

### Ethics approval

This is an observational study. It was approved by the National Commission for Information Technology and Freedom (CNIL) (saisine n°912523).

## Consent to participate

An information letter of survey was sent to adult students and parents of minor students (<18 years old). Written informed consent was obtained from the parents.

## Consent to publish

A statement confirming that consent to publish has been received from all participants.

## Availability of data and material (data transparency)

Not applicable.

## Code availability (software application or custom code)

Not applicable.

## Consent for publication

All co-authors reviewed and approved the manuscript before submission.

## Author Contributions

Xavier Xu Wang- Conceptualization, Data analysis, Writing-original draft. Mireille Cosquer- Conceptualization, Methodology, Investigation, Writing-Review and Editing. Min Zhuang-Conceptualization, Methodology, Writing-Review and Editing. Aminata Ali- Conceptualization, Methodology, Writing-Review and Editing. Bruno Falissard-Conceptualization, Methodology, Writing-Review and Editing. Emmanuelle Corruble- Conceptualization, Resources, Supervision, Writing-Review and Editing. Florence Gressier- Conceptualization, Supervision, Writing-Review and Editing. Catherine Joussemel-Conceptualization, Methodology, Investigation, Resources, Supervision, Project Administration. All co-authors reviewed and approved the manuscript prior to submission.

## Conflicts of interest/Competing interests

No competing financial interests exist.

## Acknowledgments

We sincerely thank David Gregory BARNES to provide proofreading for this study.

## References

- [1] World Health Organisation. WHO:Suicide data. Disponible sur: [http://www9.who.int/mental\\_health/prevention/suicide/suicideprevent/en/](http://www9.who.int/mental_health/prevention/suicide/suicideprevent/en/).
- [2] World Health Organisation. Adolescent health. Disponible sur: <https://www.who.int/westernpacific/health-topics/adolescent-health>.
- [3] Nock MK, Kessler RC. Prevalence of and risk factors for suicide attempts versus suicide gestures: analysis of the National Comorbidity Survey. *J Abnorm Psychol* 2006;115(3):616–23.
- [4] Janssen E, Spilka S, du Roscoët E. Tentative de suicide, pensées suicidaires et usages de substances psychoactives chez les adolescents français de 17 ans. Suicide et tentatives de suicide : données épidémiologiques récentes. 2019.
- [5] Greteman AJ. *LGBTQ Youth and Education: Policies and Practices* by Chris Mayo. *J Homosex*. 2015;62(3):427–31.
- [6] Teasdale B, Bradley-Engen MS. Adolescent same-sex attraction and mental health: the role of stress and support. *J Homosex* 2010;57(2):287–309.
- [7] Turpin RE, Rosario AD, Dyer TV. Substance use and suicide attempts among adolescent males who are members of a sexual minority: a comparison of synthesized substance-use measures. *Am J Epidemiol*. 2020;189(9):900–9.
- [8] Firdion JM, Beck F. Les jeunes LGBT face au risque : suicide et pratiques addictives. *Arch Pédiatrie*. 2015;22(5):124–5.

- [9] Seil KS, Desai MM, Smith MV. Sexual orientation, adult connectedness, substance use, and mental health outcomes among adolescents: findings from the 2009 New York City Youth Risk Behavior Survey. *Am J Public Health* 2014;104(10):1950–6.
- [10] Williams AJ, Jones C, Arcelus J, Townsend E, Lazaridou A, Michail M. A systematic review and meta-analysis of victimisation and mental health prevalence among LGBTQ+ young people with experiences of self-harm and suicide. *De Luca V, éditeur. PLOS ONE* 22 2021;16(1):e0245268.
- [11] Green AE, Price-Feeney M, Dorison SH. Association of Sexual orientation acceptance with reduced suicide attempts among lesbian, gay, bisexual, transgender, queer, and questioning youth. *LGBT Health*. 2021;8(1):26–31.
- [12] Johns MM, Lowry R, Rasberry CN, Dunville R, Robin L, Pampati S, et al. Violence victimization, substance use, and suicide risk among sexual minority high school students - United States, 2015–2017. *MMWR Morb Mortal Wkly Rep* 2018;67(43):1211–5.
- [13] Padilla YC, Crisp C, Rew DL. Parental acceptance and illegal drug use among gay, lesbian, and bisexual adolescents: results from a National Survey. *Soc Work*. 2010;55(3):265–75.
- [14] Mutumba M, Harper GW. Mental health and support among young key populations: an ecological approach to understanding and intervention. *J Int AIDS Soc*. 2015;18:19429.
- [15] Busby DR, Horwitz AG, Zheng K, Eisenberg D, Harper GW, Albuher RC, et al. Suicide risk among gender and sexual minority college students: The roles of victimization, discrimination, connectedness, and identity affirmation. *J Psychiatr Res* 2020;121:182–8.
- [16] Hatzenbuehler ML, Keyes KM. Inclusive Anti-bullying Policies and Reduced Risk of Suicide Attempts in Lesbian and Gay Youth. *J Adolesc Health* 2013;53(1):S21–6.
- [17] Liu RT, Mustanski B. Suicidal Ideation and Self-Harm in lesbian, gay, bisexual, and transgender youth. *Am J Prev Med*. 2012;42(3):221–8.
- [18] Puckett JA, Horne SG, Surace F, Carter A, Noffsinger-Frazier N, Shulman J, et al. Predictors of sexual minority youth's reported suicide attempts and mental health. *J Homosex*. 2017;64(6):697–715.
- [19] Lothwell LE, Libby N, Adelson SL. Mental health care for LGBT youths. *FOCUS*. 2020;18(3):268–76.
- [20] Mustanski B, Liu RT. A longitudinal study of predictors of suicide attempts among lesbian, gay, bisexual, and transgender youth. *Arch Sex Behav* 2013;42(3):437–48.
- [21] Whitaker K, Shapiro VB, Shields JP. School-Based Protective Factors Related to Suicide for Lesbian, Gay, and Bisexual Adolescents. *J Adolesc Health* 2016;58(1):63–8.
- [22] Walls NE, Freedenthal S, Wisneski H. Suicidal ideation and attempts among sexual minority youths receiving social services. *Soc Work*. 2008;53(1):21–9.
- [23] D'Augelli AR, Hershberger SL. Lesbian, gay, and bisexual youth in community settings: Personal challenges and mental health problems. *Am J Community Psychol*. 1993;21(4):421–48.
- [24] Lian Q, Zuo X, Lou C, Gao E, Cheng Y. Sexual orientation and risk factors for suicidal ideation and suicide attempts: a multi-centre cross-sectional study in three Asian cities. *J Epidemiol* 2015;25(2):155–61.
- [25] Janiri D, Doucet GE, Pompili M, Sani G, Luna B, Brent DA, et al. Risk and protective factors for childhood suicidality: a US population-based study. *Lancet Psychiatry*. 2020;7(4):317–26.
- [26] Joussemel C, Cosquer M, Hassler C. Portraits d'adolescents : Enquête épidémiologique multicentrique en milieu scolaire en 2013. 2015.
- [27] Taliaferro LA, Muehlenkamp JJ. Nonsuicidal Self-Injury and Suicidality Among Sexual Minority Youth: Risk Factors and Protective Connectedness Factors. *Acad Pediatr*. 2017;17(7):715–22.
- [28] Revah-Levy A, Birmaher B, Gasquet I, Falissard B. The Adolescent Depression Rating Scale (ADRS): a validation study. *BMC Psychiatry*. 2007;7:2.
- [29] Kim YJ, Quinn CR, Moon SS. Buffering Effects of Social Support and Parental Monitoring on Suicide. *Health Soc Work* 2021;46(1):42–50.
- [30] Herrell R, Goldberg J, True WR, Ramakrishnan V, Lyons M, Eisen S, et al. Sexual Orientation and Suicidality: A Co-twin Control Study in Adult Men. *Arch Gen Psychiatry* 1999;56(10):867.
- [31] Needham BL, Austin EL. Sexual orientation, parental support, and health during the transition to young adulthood. *J Youth Adolesc* 2010;39(10):1189–98.
- [32] Markham CM, Lormand D, Gloppen KM, Peskin MF, Flores B, Low B, et al. Connectedness as a predictor of sexual and reproductive health outcomes for youth. *J Adolesc Health*. 2010;46(3):S23–41.
- [33] Eisenberg ME, Resnick MD. Suicidality among gay, lesbian and bisexual youth: the role of protective factors. *J Adolesc Health* 2006;39(5):662–8.
- [34] Binder P, Heintz AL, Servant C, Roux MT, Robin S, Gicquel L, et al. Screening for adolescent suicidality in primary care: the bullying-insomnia-tobacco-stress test. a population-based pilot study: screening for adolescent suicidality. *Early Interv Psychiatry* 2018;12(4):637–44.
- [35] Brunner R, Kaess M, Parzer P, Fischer G, Carli V, Hoven CW, et al. Life-time prevalence and psychosocial correlates of adolescent direct self-injurious behavior: A comparative study of findings in 11 European countries. *J Child Psychol Psychiatry*. 2014;55(4):337–48.
- [36] Ryan C, Huebner D, Diaz RM, Sanchez J. Family rejection as a predictor of negative health outcomes in white and Latino lesbian, gay, and bisexual young adults. *Pediatrics*. 2009;123(1):346–52.
- [37] Consoli A, Peyre H, Speranza M, Hassler C, Falissard B, Touchette E, et al. Suicidal behaviors in depressed adolescents: role of perceived relationships in the family. *Child Adolesc Psychiatry Ment Health* 2013;7(1):8.

- [38] D'Augelli AR, Hershberger SL, Pilkington NW. Lesbian, gay, and bisexual youth and their families: disclosure of sexual orientation and its consequences. *Am J Orthopsychiatry* 1998;68(3):361–71.
- [39] Cyrulnik B. Quand un enfant se donne «la mort». Odile Jacob; 2011.
- [40] Thoits PA. Social support as coping assistance. *J Consult Clin Psychol* 1986;54(4):416–23.
- [41] Mustanski B, Newcomb ME, Garofalo R. Mental health of lesbian, gay, and bisexual youths: a developmental resiliency perspective. *J Gay Lesbian Soc Serv*. 2011;23(2):204–25.
- [42] DeHaan S, Kuper LE, Magee JC, Bigelow L, Mustanski BS. The interplay between online and offline explorations of identity, relationships, and sex: a mixed-methods study with LGBT youth. *J Sex Res*. 2013;50(5):421–34.
- [43] Ybarra ML, Mitchell KJ, Palmer NA, Reisner SL. Online social support as a buffer against online and offline peer and sexual victimization among U.S. LGBT and non-LGBT youth. *Child Abuse Negl*. 2015;39:123–36.
- [44] Consolacion TB, Russell ST, Sue S. Sex, race/ethnicity, and romantic attractions: Multiple minority status adolescents and mental health. *Cultur Divers Ethnic Minor Psychol* 2004;10(3):200–14.