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Original scientific paper

The Presence of Suicidal Thoughts and Their Connection with Loneliness in Nurses in Social, Family and Romantic Context

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Abstract

Aim. The aim of this research was to examine suicidal thoughts and their differences between nursing students and nurses, their correlation with sociodemographic variables and loneliness, and the contribution of sociodemographic factors to suicidal thoughts in both groups.

Methods. A cross-sectional study was conducted on a sample of nurses and nursing students. A total of 144 respondents participated in the online survey conducted in October 2023. A total of 113 (78.5%) employed nurses, who were not engaged in studies, and 31 (21.5%) nursing students participated in the research. The median age of the students was 20 years, while the median age of the nurses was 32 years. Suicidal thoughts were assessed using the Suicidal Ideation Attributes Scale, and loneliness was measured with the Social and Emotional Loneliness Scale.

Results. Significantly higher levels of suicidal thoughts were found in nursing students compared to nurses (p=0.047). It was shown that significant predictors of suicidal thoughts in nurses include the assessment of health status (p<0.001) and social loneliness (p=0.048), while significant predictors of suicidal thoughts in nursing students include the assessment of financial status (p=0.008), and family loneliness (p<0.001).

Conclusion. The results indicated that suicidal thoughts were low in both nurses and nursing students, but significantly higher in students. Family loneliness and financial status were significant predictors of suicidal thoughts in students, while social isolation and self-assessed health status were key predictors in nurses.

Introduction

The nursing profession is faced with various challenges, and the work of nurses has become extremely responsible, demanding and stressful. Nurses today are highly educated, taking on more and more complex work tasks. Sometimes this can have negative consequences on mental health. Certainly, the most common and the least severe problems that nurses face are burnout, anxiety, stress and depression (1, 2). However, all of the above factors may serve as precursors of a much severe mental health problem: the onset of suicidal thoughts (3). The Covid-19 pandemic has opened up a number of new questions and problems, one of which is the emergence of loneliness as a significant predictor of suicidal thoughts (4 - 6). This is largely attributed to extended overtime, increased professional demands, and stringent epidemic measures. Due to a number of individual, interpersonal and occupational factors, nurses find themselves uniquely vulnerable to the risk of suicide (7 - 9).

Suicidality

The most concise definition of suicide is the intentional taking of one's own life. A broader definition divides this term into suicidal thoughts and suicidal behaviors. Suicidal thoughts refer to any thought that a person has about ending their own life (planning to commit suicide or wanting the person to be dead) (10). Suicidal behaviors include a wide range of behaviors, such as obtaining large amounts of pills or other suicide paraphernalia. Most people who attempt, commit, or contemplate suicide experience feelings of hopelessness, helplessness, sadness, guilt, or shame. One of the strongest risk factors is an earlier suicide attempt (11). Research shows that suicidal thoughts are largely present in people who have been diagnosed with mental disorders, most often in depressive or bipolar disorder (12). However, it is important to emphasize that every person who has a depressive disorder does not necessarily think about suicide, nor does every person who commits or attempts suicide necessarily have to be depressed. One of the largest studies conducted in the USA on a sample of nurses revealed that nurses are at a higher risk of suicidal ideation compared to other workers. Moreover, nurses experiencing such thoughts are less likely to seek help than their counterparts without them (13). These findings are in line with research that has confirmed that all helping professions, in general, face an elevated risk of suicidal thoughts (14 - 16). Certain personality characteristics are also considered risk factors that can lead a person to commit suicide. Very often, impulsivity is associated with suicidality. Personality traits may make independent contributions to current suicidal ideation and previous suicide attempts in certain subgroups of suicidal individuals (17). A narcissistic person also has a hard time coping with the idea that others notice their imperfection, particularly through their own failures, which can, in some cases, contribute to the risk of a suicide attempt. Whether a person will attempt and/or commit suicide depends on the risk factors, but also on the protective factors present in their life. Some of the protective factors are: developed problem-solving skills, optimism, developed self-esteem and self-confidence, social support, self-confidence, social support, well-defined life goals, perceived high connection, parental cohesion and religious involvement (18). Research on nurses has revealed significant differences in suicidal thoughts based on age, years of service, marital status, living environment (urban vs. rural), and workplace settings (19, 20). Participants who tested positive for almost all measured mental disorders exhibited significantly higher rates of suicidal thoughts (21, 22). Numerous studies underscore the importance of recognizing suicidality and suicidal thoughts among nursing students, indi-

cating that education in this area could play a crucial role in suicide prevention (23). However, very few studies have specifically explored attitudes towards suicide risk among nursing students, and there is no existing data for the Republic of Croatia. A study conducted in China with 393 participants demonstrated that a sense of belonging to a school community can mitigate the negative effects of loneliness on suicidal thoughts and depression. The study found significant evidence of an interaction between loneliness and school belonging as predictors of both suicidal thoughts and depression (24). Additionally, adolescent suicidal behavior is associated with factors such as female gender, substance abuse, running away from home, being raised in a single-parent family, family member alcohol dependency, and experiences of violence (25). In the context of shift work and excessive overtime, some studies suggest that both sleep disturbances and short sleep duration can contribute to the development of suicidal thoughts (26).

Loneliness

In situations where an individual's social relationships are deficient either in quality or quantity, a person experiences a feeling of loneliness (27). Loneliness is most often defined as an unpleasant and emotionally disturbing subjective experience, arising from a discrepancy between the desired and achieved level of social contact. It is accompanied by a feeling of rejection by those we care about, paired with a longing for their acceptance and inclusion in their lives (28). One of the main reasons we feel lonely is the feeling that we are psychologically alone, despite the fact that there are other people around us, because we have not established close relationships with them (29). Although some researchers believe that loneliness is a unique experience, that is, that we all feel the same regardless of the causes that led to loneliness and in what circumstances it occurred, there are also those who believe that loneliness has several dimensions (27). As social loneliness is a broad term, DiTomasso and Spinner proposed a new tripartite theory of loneliness by developing a measure that assesses loneliness in three aspects: friendship, family, and romantic love (29, 30). Thus, a person who is lonely in one area does not have to be lonely in another. It is assumed that sociodemographic characteristics, such as gender, age, education, geographical mobility, and economic, residential and marital status, precede loneliness because they affect the possibility of creating and maintaining an optimal social network, and thus the subjective experience of loneliness (31). The variables that describe the quantity and quality of social relationships – the number of close friends, the quality of friendships, reciprocity in relationships, social support, social skills, social strategies – stand out as one of the most important correlates of loneliness. Personality traits (traits from the five-factor model, shyness, locus of control, self-esteem) and indicators of physical and mental health (anxiety, depression) also play a significant role, and they are sometimes treated as determinants and sometimes as consequences of loneliness (29).

Aim

1. To examine the presence of suicidal thoughts and their differences between nursing students and nurses
2. To examine the correlation of suicidal thoughts with sociodemographic variables (gender, age, place of residence, self-reported health and financial status, and family relationships) and loneliness in nursing students and nurses
3. To examine the contribution of sociodemographic variables (gender, age, place of residence, self-reported health and financial status, and family relationships) to suicidal thoughts in nurses and nursing students

Methods

Respondents

A cross-sectional study was carried out involving nurses, and nursing students. A total of 165 participants were included, and after excluding respondents who failed to fully complete the questionnaire or who failed to meet the criteria, a total of 144 respondents remained. The research was conducted in October 2023. Respondents from various regions across the Republic of Croatia participated in the research. Before the respondents started to fill out the questionnaire, the reason for the research was explained to them in text form, and they were obliged to give their consent to the research. To ensure the anonymity of respondents, the respondents' personal data, such as name and surname, social security number, and email address, were not collected during the questionnaire process. However, in order to prevent multiple submissions of the questionnaire by the same individual, respondents were required to provide identification when completing the questionnaire, though their addresses were not collected. The research was conducted online via the Google Forms platform, while the respondents were recruited via various channels (Viber, WP, Facebook and similar platforms). Among the respondents, a total of 113 (78.5%) were employed nurses who were not pursuing further studies, while 31 (21.5%) were nursing students. The median age of the students was 20 years (interquartile range 19 to 23 years), while the median age of the nurses was 32 years (interquartile range 25 to 40.5 years). The inclusion criteria for nurses required them to be currently employed and not enrolled in studies. Respondents who indicated both 'employed' and 'currently studying part-time' were excluded. The same applied to students, only students who were actively studying were included. The criterion was assessed through the question 'Your current employment status: ' with response options of 'Employed', 'Studying', 'Unemployed' and 'Employed and studying'.

The second criterion was for the respondents to be from the territory of the Republic of Croatia. The respondents were filtered out through the question that followed after consent to the research 'Are you a nurse who is currently employed or studying nursing in the Republic of Croatia?'. The respondents who gave a negative answer were excluded from the research. The third criterion was consent to the research.

Instruments

Socio-demographic questionnaire - in this part of the questionnaire data on gender, age, place of residence, financial and health status, and an assessment of family relationships were collected. All questions were closed-ended, and respondents could choose one of the possible answers. Respondents answered questions on self-assessment of financial and health status and family relationships on a 5-point Likert scale, with '1' indicating very bad, while '5' indicating excellent.

Suicidal Ideation Attributes Scale (SIDAS) is intended to screen for suicidal thoughts within the community and evaluate their severity. It comprises five items, each addressing a different attribute of suicidal ideation: frequency, controllability, proximity to attempts, distress level associated with the thoughts, and impact on daily functioning (32). The SIDAS scale consists of 5 items that respondents answered on a 10-point Likert scale, with '0' indicating the absence of suicidal thoughts and '10' indicating the highest intensity of suicidal thoughts. If respondents answered the first question 'In the past month, how often have you had thoughts about suicide?' with '0', the total score was 0, regardless of other scores. The total score of the scale is the sum of all responses, while the range of possible scores was 0 to 50. The reliability level of the SIDAS is 0.91 (32).

The Social and Emotional Loneliness Scale includes three subscales that explore loneliness across different domains: friendships (social loneliness subscale, 13 items), family relationships (family loneliness subscale, 11 items), and romantic loneliness (love loneliness subscale, 12 items) (33). Participants rated their agreement level with each statement on a scale from 1, indicating 'strongly disagree', to 7, indicating 'strongly agree'. The total score for each subscale was calculated by summing the participant's ratings on the corresponding items. The possible range of results for the social loneliness subscale is 13 - 91, family loneliness 11 - 77 and romantic loneliness 12 - 84. A higher score on each subscale indicates greater loneliness in the specific domain. The reliability level is 0.89 for the social loneliness scale, 0.85 for family loneliness, and 0.91 for romantic loneliness (33).

Statistics

Descriptive statistical methods were employed to outline the frequency distribution of the variables examined. Mean values were reported using the median and interquartile range. The normality of the distribution was assessed using the Kolmogorov-Smirnov test. The Kolmogorov-Smirnov test values for all numerical variables were significant (p<0.001). Upon examining skewness and kurtosis, most values exceeded 1, except for the skewness of emotional loneliness and the kurtosis of age, which were below 1. However, for suicidal thoughts, the skewness value was greater than 2. Correlations were calculated using Spearman and Point Biserial correlations. The Mann-Whitney test was used to assess differences in suicidal thoughts scores between nurses and nursing students. To determine the variables' contribution to suicidal thoughts, Linear Regression Analysis (enter method) was applied. The prerequisites for linear regression analysis were met. On the sample of students, the VIF values ranged from 1,253 to 1,400, while on the sample of nurses it was in the range of 1,195 to 2,410. Since VIF values below 5 are generally considered acceptable, this indicates the absence of significant multicollinearity. The normality of residuals was confirmed by the Kolmogorov-Smirnov test, where the p-value for unstandardized and standardized residuals in the sample of students was 0,106, while in the sample of nurses it was p=0114, suggesting that deviations from normality are not statistically significant. The Durbin-Watson on the sample of students was 1,712, while on the sample of nurses it was 2.007 which indicates a slight positive autocorrelation, but it remains within the generally acceptable range of 1,5 to 2,5, suggesting that autocorrelation is not a significant issue. A scatterplot of residuals for the overall regression shows randomly distributed residuals around the zero axis, with no discernible patterns, supporting the assumption of homoscedasticity. The dispersion is uniform, indicating that the assumptions of linearity and homoscedasticity are met, with one deviation that may represent an outlier. A significance level of p<0.05 was adopted. Data analysis was conducted using JASP version 0.17.2.1 (Department of Psychological Methods, University of Amsterdam, Amsterdam, The Netherlands) (34).

Results

The study included 102 women (70,8%), 79 (54.9%) with secondary school education, and 103 (71.5%) living in the city. Most of them assessed their financial situation as good (79 respondents or 54.9%), family relationships as good (71 respondents or 49.3%), and family relationships as good (77 respondents or 53.5%). The median age of the respondents was 27 years (interquartile range 22 to 38 years) (Table 1).

The results show a relatively low prevalence of suicidal thoughts in both nurses and nursing students. However, there is a significant difference in suicidal thoughts between nurses and nursing students (Mann Whitney test; p=0.047), with significantly higher suicidal thoughts in nursing students compared to nurses (Table 2).

In the group of students, the results showed that there is a significant moderate positive correlation between suicidal thoughts and family loneliness (ρ=0.018; p=0.018) and a moderate negative correlation with the assessment of financial status (ρ=-0.420; p=0.019), the higher the family loneliness, the higher suicidal thoughts, while the worse the financial situation, the higher the suicidal thoughts in nursing students. In the group of nurses, the results showed that suicidal thoughts was moderately positively associated with social (ρ=0.385; p<0.001), emotional (ρ=0.302; p=0.001) and family loneliness (0.386; p<0.001) and low negative with age (ρ=- 0.216; p=0.022), financial status (ρ=-0.232; p=0.014), family relationships (ρ=-0.244; p=0.009) and self-assessment of their health condition (ρ=-0.294; p=0.002), that is, the higher the social, emotional and family loneliness, the higher the suicidal thoughts, while the lower the age, the worse the financial and health condition and relationships in the family, the higher the suicidal thoughts (Table 3).

In order to determine the contribution of the variable to suicidal thoughts in nurses, the Linear Regression Analysis was used. The regression analysis included variables that were found to be significant in correlations; social, emotional and family loneliness, age, self-rated financial status, family relationships and self-rated health status. It has been shown that significant predictors of suicidal thoughts in nurses are self-rated health status (p<0.001) and social

Table 1. **Sociodemographic characteristics of the total sample of respondents**

		Total	Students	Nurses
			N (%)	
Gender	male	42 (29.2)	11 (35.5)	31 (27.4)
	female	102 (70.8)	20 (64.5)	82 (72.6)
Place of residence	city	103 (71.5)	22 (71)	81 (71.7)
	village	41 (28.5)	9 (29)	32 (28.3)
Self-assessment of financial status	extremely bad	1 (0.7)	0	1 (0.9)
	bad	5 (3.5)	1 (3.2)	4 (3.5)
	moderate	49 (34)	13 (41.9)	36 (31.9)
	good	79 (54.9)	15 (48.4)	64 (56.6)
	excellent	10 (6.9)	2 (6.5)	8 (7.1)
Self-assessment Family relationships	extremely bad	6 (4.2)	1 (3.2)	5 (4.4)
	bad	1 (0.7)	0	1 (0.9)
	moderate	30 (20.8)	7 (22.6)	23 (20.4)
	good	71 (49.3)	12 (38.7)	59 (52.2)
	excellent	36 (25)	11 (35.5)	25 (22.1)
Self-assessment of health status	extremely bad	2 (1.4)	0	2 (1.6)
	bad	4 (2.8)	1 (3.2)	3 (2.7)
	moderate	30 (20.8)	3 (9.7)	27 (23.9)
	good	77 (53.5)	16 (51.6)	61 (54)
	excellent	31 (21.5)	11 (35.5)	20 (17.7)
Employment	students	31 (21.5)		
	nurses	113 (78.5)		
			Me (IQR)	
Age		27 (22 - 38)	20 (19 - 23)	32 (25 - 40.5)

Note: n – number of respondents; % - percentage; Me – Median, IQR – Interquartile range

Table 2. **Differences in suicidal thoughts and loneliness between nurses and nursing students**

	Nurses	Nursing Students	*p**
	Median (interquartile range)		
Suicidal thoughts	0 (0 - 4.5)	3 (0 - 10)	**0.047**
Social loneliness	26 (19.5 - 37)	28 (19 - 44)	0.712
Emotional loneliness	33 (22 - 52.5)	50 (26 - 60)	0.104
Family loneliness	17 (12 - 27.5)	20 (12 - 27)	0.932

Note: *p* - Statistical significance; * Mann Whitney test

Table 3. **The correlation of suicidal thoughts with demographic variables and loneliness in nurses and nursing students**

		Students	Nurses
		Suicidal thoughts	
Social loneliness	ρ	0.298	0.385
	p	0.104	**<0.001**
Emotional loneliness	ρ	0.152	0.302
	p	0.416	**0.001**
Family loneliness	ρ	0.423	0.386
	p	**0.018**	**<0.001**
Age	ρ	0.286	-0.216
	p	0.118	**0.022**
Gender	r	0.251	-0.076
	p	0.173	0.424
Place of residence	r	0.085	**0.041**
	p	0.648	0.664
Finance	ρ	-0.420	-0.232
	p	0.019	**0.014**
Relationships in the family	ρ	-0.333	-0.244
	p	0.067	**0.009**
Health Assessment	ρ	-0.198	-0.294
	p	0.285	**0.002**

Note: ρ – Spearman's correlation coefficient rho; r – Point Bisserial correlation coefficient; p – Statistical significance

Table 4. **Summary of the regression analysis - dependent variable suicidal thoughts in nursing students**

	Standardized Coefficients	t	*p*	95% CI β		Adjusted R^2
	β			Lower Bound	Upper Bound	
(Constant)		2.377	0.019	1.383	15.258	0.307
Family loneliness	0.271	3.034	**0.003**	0.053	0.252	
Financial status	- 0.242	- 2.712	**0.008**	- 3.929	- 0.611	

Note: ***p*** - statistical significance; β - regression coefficient; t - the size of the difference relative to the variation in sample data; Adjusted R^2 – adjusted coefficient of determination

Table 5. **Regression analysis summary - dependent variable suicidal thoughts in nurses**

	Standardized Coefficients β	t	*p*	95% CI for β		Adjusted R^2
				Lower Bound	Upper Bound	
(Constant)		2.106	0.038	0.743	24.701	0,307
Social loneliness	0.199	1.998	**0.048**	0.001	0.189	
Emotional loneliness	0.041	0.431	0.667	- 0.052	0.080	
Family loneliness	0.122	1.045	0.298	- 0.062	0.199	
Age	- 0.033	- 0.383	0.702	- 0.118	0.080	
Financial status	- 0.018	- 0.188	0.852	- 1.972	1.631	
Family relationships	- 0.023	- 0.221	0.826	- 1.675	1.339	
Health status	- 0.397	- 4.269	**<0.001**	- 4.718	- 1.725	

Note: *p* - statistical significance; β - regression coefficient; t - the size of the difference relative to the variation in sample data; Adjusted R^2 – adjusted coefficient of determination

loneliness (p=0.048). Variables significantly explain 28.4% of the variance in suicidal thoughts (Adjusted R^2 = 0.284; p<0.001). Insight into the β coefficient shows that the self-rated health status contributes negatively, while social loneliness contributes positively to suicidal thoughts in nurses (Table 5).

Discussion

The aim of this research was to examine the presence of suicidal thoughts and their differences between nursing students and nurses, correlation of suicidal thoughts with sociodemographic variables (gender, age, place of residence, self-reported health and financial status, and family relationships) and loneliness in nursing students and nurses and to examine the contribution of sociodemographic variables to suicidal thoughts in nurses and nursing students.

The results showed a significant difference in suicidal thoughts between female nurses and nursing students. The results are partly consistent with previous studies (35), which showed an elevated risk among female nursing students, paralleling the findings related to qualified nurses (35). However, the study revealed that female nursing students had a relatively high rate of hospitalization for self-harm prior to beginning their nursing education**.** It also suggests that increased risk of suicidality may partly be attributed to pre-existing vulnerabilities, although our study lacks this specific data. Healthcare professionals seem to have a heightened risk of suicidal thoughts, which is closely connected to the stressful nature of their work and the mental health impact of these stressors. Lower levels of work-related stress have been shown to provide a protective effect against suicidal thoughts (36).

Also, possible causes of the above result can lie in the fact that during their education, nursing students may encounter various stressors that are not typically faced by students in other fields. Clinical practice, a mandatory component of the nursing curriculum, can expose students to stressful and traumatic experiences. Interpersonal relationships within this demanding environment also play a significant role in students' stress levels (37). Institutions offering nursing degree programs have a duty to ensure that prospective students are thoroughly prepared for both the theoretical and practical demands of their education. It is also important to support students in making informed decisions about whether nursing education is the right choice for them. Moreover, students facing mental health challenges should receive appropriate support, and efforts should be made to reduce the stigma associated with seeking help. Faculty members responsible for students with mental health issues must be adequately trained and supported (38).

Beyond educational institutions, senior clinical staff or mentors should also take responsibility for student well-being by implementing necessary support strategies. This could include providing resources for adequate student support and fostering effective communication between educational institutions and mentors to ensure consistent support across different environments.

The recent COVID-19 pandemic, which involved some students during their studies, introduced new stressors such as isolation from family and friends, fear of the unknown, and the awareness of insufficient knowledge and skills to manage the threat of infection (39). The literature also documents the pandemic's impact on nursing students' well-being, including a high prevalence of depression, anxiety, and post-traumatic stress disorder (PTSD), all of which are recognized as risk factors for developing suicidal thoughts (40).

However, it should be noted that the results of suicidal thoughts in both groups are very low, including in the nursing student group. Although they are very low, they still indicate a higher level of suicidal thoughts in the student group, and therefore it is important to pay attention to this group, which might be potentially at risk in the future. Therefore, it would be good to conduct research that would follow nurses over a longer period of time, from studies through work, to see in which part of personal life or professional life there is an increase in suicidality in the aforementioned group. It is also important to consider many other factors that may play a role in the development of suicidal thoughts that were not included in the study. Possible reasons for such low results in nurses in particular, but also in nursing students, is a sense of professional purpose. This helps individuals to better cope with stressful situations and professional challenges, and may play an important role in reducing the risk of suicidal thoughts among nursing students and nurses, because the core of nursing as a profession is to help others and provide support to patients in their most difficult moments, which can strengthen the sense of self-worth and meaning in life. Helping others can foster a deep-rooted sense of personal satisfaction and achievement (41, 42). Professional purpose can also provide emotional resilience for nurses and students, because the feeling that their work has a positive impact on the community can act as a protective factor against negative emotions and thoughts, including suicidal thoughts. However, this sense of purpose can be compromised if individuals do not receive sufficient support or face burnout, which further emphasizes the importance of maintaining a positive work environment and the availability of mental health resources (43).

The results of the research show a significant link between suicidal thoughts and feelings of family loneliness, as well as poor financial condition among nursing students. Research on this topic has not been conducted and the results cannot be compared with previous research. However, possible reasons could be sought in a lack of emotional support and connection to family, leading to family loneliness, which reduces students' ability to cope with stress and difficulties, thus increasing the risk of suicidal thoughts. In addition to conflicts within the family, social isolation also stands out as an important factor in suicidal behavior (44). Studies highlight that social support is an important protective factor, with social integration associated with a lower risk of suicidal thoughts among qualified nurses (45). Furthermore, loneliness associated with suicidal thoughts, as confirmed in this study, has been recognized as a predictor of suicidal thoughts, especially among women aged 16 to 20 years (46). Interventions that promote social integration and support for nursing students can be beneficial, with peer support programs having positive personal and professional effects (47, 48) and may be more beneficial than professional help (49). The influence of family loneliness on suicidal thoughts in nursing students can be partly explained by the separation process that takes place during adolescence but does not necessarily end at that stage. It is questionable to what extent students are ready to cope with new life obligations, while for older nurses after the separation is completed, social loneliness becomes more important than family loneliness. A poor financial situation can cause chronic stress, insecurity, and feelings of hopelessness, which are known risk factors for suicidal thoughts. Students facing financial difficulties may feel additional pressure and uncertainty about the future, which can increase the risk of suicidal thoughts. Numerous studies confirm the link between economic hardship and suicidal thoughts. Our results are consistent with other studies that have also shown an association between suicidal thoughts and financial problems (50 - 52). A Danish study found that the risk of suicide increased as income decreased, but this ratio was not true for wealth and disappeared after psychiatric factors

were taken into account (53). Therefore, it is important to investigate how low socioeconomic situation is related to suicide risk, while controlling for key confounding factors. Another possible reason for this result is that students often rely on family, loans, or limited financial aid to cover living and academic expenses. Without a regular income, students may struggle to pay for basic necessities like housing, food, and transportation, leading to increased financial stress. This financial instability can exacerbate feelings of hopelessness, which are strongly linked to mental health problems such as depression and suicidal thoughts (54, 55).

Our research reveals that impaired health status is a significant predictor of suicidal ideation among nurses, which is consistent with the findings of other studies (56 - 58). Poor physical health can act as a source of stress that exacerbates psychological stress. Health problems, pain, and chronic illness can significantly reduce quality of life and increase feelings of hopelessness, which can contribute to suicidal thoughts. There is a strong correlation between physical and mental health, with poor physical health being able to cause depression, anxiety, and other mental difficulties. How individuals experience and assess their health can have a profound impact on their mental state. If nurses feel their health is poor, it can increase feelings of helplessness and stress. Working in healthcare often involves high physical and emotional demands, and if workers feel physically exhausted or sick, it can be more difficult for them to cope with daily stress. Long working hours, responsibilities, and emotional pressures in the healthcare sector are already contributing to high levels of stress, and poor health can further exacerbate these stressors. Frequent absences from work due to health problems can cause job insecurity, financial difficulties and a feeling of isolation from colleagues. These results highlight the need for a comprehensive approach to the health of nurses, encompassing both physical and mental health. Properly identifying and addressing health issues can reduce the risk of suicidal thoughts and improve the overall well-being of these key healthcare professionals. Implementing appropriate support programs and interventions can have a significant positive impact on their lives and the quality of healthcare they provide.

Social loneliness also proved to be a significant predictor of suicidal thoughts in the group of nurses. Research on this topic has not been conducted, but the results of this research can be observed through the nursing profession, which requires long hours, emotional exhaustion, and limited opportunities for social interaction. Although certain studies did not specifically investigate the relationships of the aforementioned constructs, they have highlighted that nurses often experience feelings of isolation due to the nature of their work. This isolation limits their ability to maintain and nurture personal relationships with friends (59, 60). Consequently, this sense of thwarted belongingness, which can become closest to social loneliness, is shown to be a key psychological precursor to suicidal ideation, which is caused by the aforementioned gender factors (59, 60). Furthermore, the Covid-19 pandemic exacerbated these challenges, disrupting social relationships and causing widespread social isolation (61). It is possible that precisely due to the nature of the work of nurses during Covid 19, their isolation from friends and the creation of social loneliness occurred. Studies have shown that worsened loneliness (increased isolation during the pandemic) had a greater impact on both the presence and onset of suicidal ideation than loneliness before the pandemic (61). However, a lot of time has passed since the lifting of isolation measures, therefore it is now difficult to speak from today's perspective to what extent the conditions at the time could have influenced loneliness and consequently suicidal thoughts among nurses.

Research contribution

This research provided us with valuable data and emphasized the significance of addressing suicidal thoughts among both future and current healthcare professionals. Predisposing factors of suicidal thoughts have been observed, however there is space for new research to include more variables such as previous mental disorders, academic success, ways of coping with stress with the aim of designing quality interventions that will contribute to the timely detection of vulnerable groups in need of timely assistance. Further research should explore the mechanisms through which family loneliness and poor financial status affect suicidal thoughts. It would also be useful to develop and evaluate intervention programs that provide social and economic support to students at risk.

Limitations

This research includes several potential limitations. First, the sample of 144 participants may be too small to generalize the results to the broader population of nurses and nursing students, and the fact that the sample is limited to a specific geographical area reduces its representativeness. Also, one of the limitations of this research is the large difference in the sample of nursing students and employed nurses. Additionally, the cross-sectional design of the study captures data at a single point in time, limiting the ability to assess causal relationships between variables and preventing the tracking of changes in mental health or suicidal ideation over time. Relying on self-reported data can lead to bias and inaccuracies, as participants may underestimate or overestimate their mental health and experiences due to stigma or other reasons. The study focuses on certain factors, such as loneliness and financial status, but may omit other relevant variables like previous mental disorders, coping strategies, social support, and work stress. Uncontrolled variables, such as personal history of mental illness or family dynamics, could have also influenced the results. The findings may not be applicable to other populations due to the specific focus on nursing students and professionals and the cultural and healthcare context of the participants. The absence of qualitative data limits the depth of understanding of participants' experiences and perspectives, which could provide additional insights into the emotional and psychological aspects. Addressing these limitations in future research could provide a more comprehensive understanding of the factors influencing suicidal thoughts among nursing students and healthcare professionals.

Conclusion

The results showed that the presence of suicidal thoughts in the groups of nurses and technicians and nursing students is low. However, although low, it is significantly higher in the group of nursing students compared to nurses. In terms of predictors of suicidal thoughts, it was shown that in the group of students, family loneliness and financial status are significant predictors, while in the group of nurses, social isolation and self-assessed health status are significant predictors.

Author contributions

Conceptualization (MM, TJ, BL, IJ); Methodology (TJ, MM, HV, RL); Investigation (MM, ŠM, JTJ, IM, IZ, SK); Writing—original draft preparation (TJ, MS, JS, RL); Writing—review and editing (IM, JTJ, IZ, RL). All authors have read and agreed to the published version of the manuscript.

Conflict of interest

The authors declare no conflicts of interest.

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