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**EDITORIAL**

**EDITORIAL**





EDITORIAL



Message from the Editor-in-Chief of  
International Journal of Science Annals,  
Vol. 5, No. 1-2, 2022



Melnyk Yu. B.<sup>1,2</sup>

<sup>1</sup> Kharkiv Regional Public Organization "Culture of Health" (KRPOCH), Ukraine

<sup>2</sup> Scientific Research Institute KRPOCH, Ukraine

**Received:** 18.12.2022; **Accepted:** 23.12.2022; **Published:** 25.12.2022

**Background and  
Aim of Study:**

**Abstract**

The Russian-Ukrainian war of 2022 has caused an ongoing humanitarian crisis that undermines stability both in Ukraine and around the world. The IJSA Editorial Office and the KRPOCH Publishing, located in Kharkiv (Ukraine), found themselves in extremely difficult conditions for the implementation of their scientific and publishing activities.

**Results:**

IJSA is a scientific, periodic, peer-reviewed Journal. The IJSA has been published and has been actively developing for 5 years. The Journal reviewed more than 300 manuscripts, 5 volumes were published. The IJSA has a clear and precise procedure for reviewing and selecting papers for publication. The IJSA Editorial Board includes the most authoritative scientists from 17 countries, 5 continents in the fields of Education, Psychology, and Medicine. The Journal is presented in more than 30 international scientometric databases, repositories and search engines, among them DOAJ, ERIH PLUS, COPE, MIAR, Crossref System, Google Scholar, ResearchGate, Zenodo, Scilit, etc. In 2018-2022 the KRPOCH Publishing and the IJSA initiated, co-organized, and sponsored the following academic projects: annual International Scientific and Practical Conferences "Psychological and Pedagogical Problems of Modern Specialist Formation" (PPPMSF), "Current Issues of Education and Science" (CIES), as well as the international competitions "Blockchain in the Digital Society" (ICBDS), "Mental Health in the Digital Society" (ICMHDS). These competitions were held among masters, graduate students, and young scientists.

**Conclusions:**

In this Editorial, I address the international academic community, universities and publishers who share our values and interests in supporting the Journal, as a sponsor or as an institutional partner of the IJSA.

**Keywords:**

journal, manuscripts, guidelines, peer review process, humanitarian crisis, institutional partner

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the author:**

**Melnyk Yuriy Borysovych** – <https://orcid.org/0000-0002-8527-4638>; [ijsa.office@gmail.com](mailto:ijsa.office@gmail.com); Doctor of Philosophy in Pedagogy, Associate Professor; Chairman of Board, Kharkiv Regional Public Organization "Culture of Health" (KRPOCH); Director, Scientific Research Institute KRPOCH, Kharkiv, Ukraine.

**Dear Readers, Authors, and Publishers,**

Russia's full-scale military invasion of Ukraine in February 2022 has led to a humanitarian crisis and created serious problems in many spheres of activity of the Ukrainian community.

The scientific community and research organizations have experienced all the hardships of the military situation. The Editorial Office of the International Journal of Science Annals (IJSA) and the IJSA Founder, Kharkiv Regional Public Organization "Culture of



Health" (KRPOCH), was located in the Ukrainian city of Kharkiv. The city was exposed to rocket, air and artillery attacks. The building of the IJSA Editorial Office and the KRPOCH Publishing was damaged by a rocket that exploded next to it, windows were shattered by shrapnel, and property was damaged.

KRPOCH employees were urgently evacuated to the west of Ukraine (Uzhgorod city), where they organized a volunteer center to provide socio-psychological and material assistance to internally displaced persons affected by Russian aggression. We have made every effort to implement previously planned national and international scientific projects: VII International Scientific and Practical Conference "Psychological and Pedagogical Problems of Modern Specialist Formation" (PPPMSF-2022), X International Scientific and Practical Conference "Current Issues of Education and Science" (CIES-2022), International Competition "Mental Health in the Digital Society" (ICMHDS-2022), as well as the preparation and publication of the IJSA, Vol. 5, 2022.

Months of missile strikes and the destruction of Ukraine's critical infrastructure have caused massive disruptions and restrictions in power supply, the Internet and more.

These objective reasons, as well as the loss of computer equipment and printing equipment, made it almost impossible to implement some projects (PPPMSF-2022, ICMHDS-2022).

The IJSA Editorial Office had to be moved from Uzhhorod (Ukraine) to Vienna (Austria), where the implementation of the CIES-2022 project and the IJSA publication were temporarily continued.

In 2022, the IJSA Editorial Office received 32 manuscripts:

13 manuscripts (40.6%) were rejected during the preliminary evaluation process;

14 manuscripts (43.8%) were rejected during the peer review process;

5 manuscripts (15.6%) were accepted and published in this volume.

At the first stage, the reasons for rejection are the guidelines of the study have not been followed; the manuscript title is out of scope of the Journal, manuscript requirements have not been followed, the manuscript contains stylistic, spelling and syntax errors, plagiarism, etc.

At the second stage, the reasons for rejection are scientific relevance and practical importance are absent, methodological errors, there is no logic between the sections of the manuscript, etc.

We guarantee compliance the proper level of publication ethics, copyright protection at all stages of material review.

Therefore, the IJSA has a clear and precise procedure for reviewing and selecting papers for publication.

Our Journal solves the dilemma of quality and quantity of papers definitely in favor of quality (Melnyk & Pypenko, 2021).

The Journal should motivate young talented scientists to publish their manuscripts by providing them with

editorial support in the preparation of the manuscript and funding for its publication.

In 2022, as before, KRPOCH covered the costs from 80 to 100% for the publication of manuscripts accepted by the Journal.

KRPOCH is a non-profit organization that has received no public or private sponsorship funding for its publishing activities. Therefore, a strict editorial and review process, as well as limited financial resources, allow us to publish no more than 15% of the articles submitted to the Journal.

The subject of this Journal volume was devoted to topical issues of physical and mental health protection among schoolchildren, students, cadets in the conditions of martial law in Ukraine, international research in the field of hygiene, as well as research in the field of oncology and accompanying these persons.

The Journal is presented in more than 30 international scientometric databases, repositories and search engines, among them: Le Centre International de l'ISSN, ROAD (France); Crossref System, Google Scholar, GitHub, OAJI (USA); DOAJ (Sweden); OpenAIRE, ERIH PLUS (Norway); EndNote Click (Great Britain); COPE, Jisc (United Kingdom); BASE, ResearchGate (Germany); Zenodo; Scilit (Switzerland); MIAR (Spain); OUCI (Ukraine), etc.

I express my deep gratitude to all the IJSA Reviewers, as well as to the IJSA Editorial Board Members, for their work and moral support of our activities in this difficult time for us.

I also express my solidarity with leading publications such as Nature and Science (McNutt & Hildebrand, 2022), which have condemned Russia's military aggression against Ukraine in editorials, as well as Elsevier, which took the initiative to provide financial support to Ukrainian researchers in its periodicals.

We hope that the international scientific community will render real help in rebuilding science and research infrastructure in Ukraine, an important component of which is the publishing activity of scientific periodicals. We are currently looking for institutional partners among international academic organizations and publishing houses in order to restore and develop the IJSA.

## **Conclusions**

The Russian-Ukrainian war of 2022 is an ongoing humanitarian crisis that is disrupting stability both in Ukraine and around the world.

This war has resulted in many deaths, severe damage to critical infrastructure and activities of the Ukrainian community. KRPOCH scientific and publishing activity has appeared in extremely difficult conditions. In essence, the question became about the survival of the IJSA.

In this Editorial, I address the international academic community, universities and publishers who share our values and interests in supporting the Journal, as a sponsor or as an institutional partner of the IJSA.



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**Dr. Yuriy Melnyk,**  
**Director of KRPOCH Publishing,**  
**Editor-in-Chief of the IJSA**

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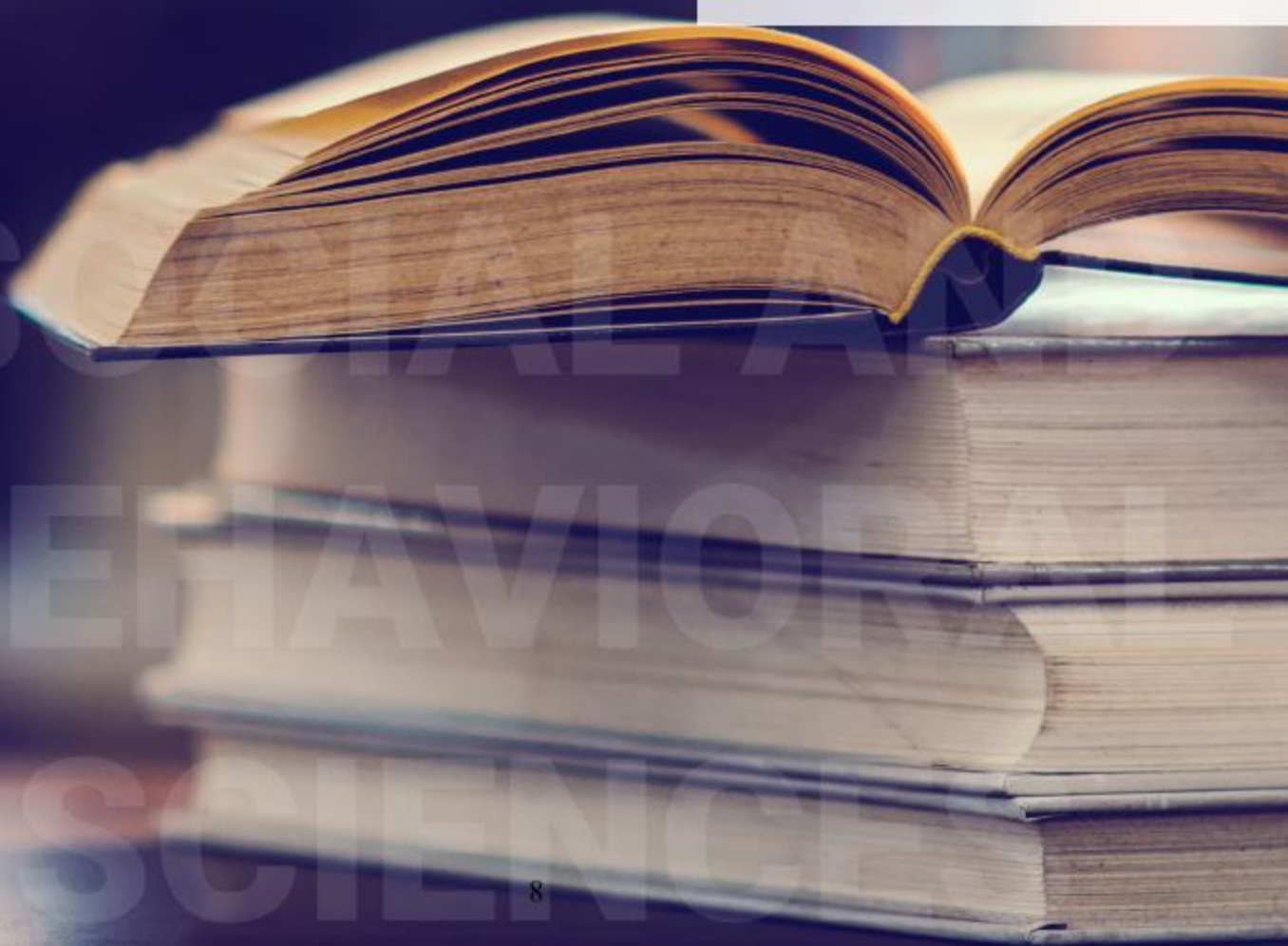


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**International Journal of Science Annals**

**SOCIAL AND  
BEHAVIORAL SCIENCES**

**Education**







## SOCIAL AND BEHAVIORAL SCIENCES. Education

### ORIGINAL RESEARCH



# Impact of Knowledge and Perception of the Swachh Bharat Abhiyan on the Health Behavior Patterns of Rural Residents in India



#### Authors' Contribution:

- A – Study design;
- B – Data collection;
- C – Statistical analysis;
- D – Data interpretation;
- E – Manuscript preparation;
- F – Literature search;
- G – Funds collection

**Madhankumar V.**<sup>1</sup> ABCEFG , **Udhayabashkaran K.**<sup>2</sup> CDEF ,  
**Arularasan S.**<sup>1</sup> EFG , **Kayalvizhli P.**<sup>1</sup> BEFG

<sup>1</sup> Govt Thiruvavur Medical College, Tamilnadu, India

<sup>2</sup> Govt Mohan Kumaramangalam Medical College, Salem Tamilnadu, India

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#### Background and Aim of Study:

#### Abstract

Swachh Bharat Abhiyan (SBA) was launched by the Prime Minister of India to accelerate the efforts for achieving universal sanitation. To ensure adequate participation, community must be sensitized about the mission objectives and its role in bringing the desired change.

The aim of the study: to assess the knowledge, perception and practices regarding SBA among rural people, and to study the association between their socio epidemiological factors and awareness regarding SBA.

#### Material and Methods:

Community based cross-sectional study was conducted for duration of 6 months (April to September 2021) at a rural area of south Tamilnadu. A sample of 250 subjects was included and was administered a predesigned, pretested, semi structured questionnaire. The responses were recorded and appropriate statistical tests were applied.

#### Results:

Mean age group of our study participants was  $47.6 \pm 9.8$  years. Television 126 (50.4%) and newspaper 41 (16.4%) were found to be the main source of information about SBA. This study showed out of 250 participants, 142 (56.8%) of them had good knowledge and 174 (69.6%) had good perception score. Our study found a statistical significant association between educational status and level of knowledge and perception score.

#### Conclusions:

The present study found that majority of the subjects were aware of SBA and were having positive attitude and perception but very less practicing in our day today life. Increasing awareness regarding health hazards of open-air defecation and improper disposal of solid waste will create a change in their behavior in adopting healthy lifestyle.

#### Keywords:

knowledge, perception, behavior patterns, practices, environmental sanitation, community

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#### Information about the authors:

**Madhankumar Velu** (Corresponding Author) – <https://orcid.org/0000-0002-3453-126X>; [madhankumarvelu1228@gmail.com](mailto:madhankumarvelu1228@gmail.com); MD Community Medicine, Assistant Professor, Department of Community Medicine, Govt Thiruvavur Medical College, Tamilnadu, India.

**Udhayabashkaran Kadirvelu** – <https://orcid.org/0000-0002-8339-7634>; MD Community Medicine, Assistant Professor, Department of Community Medicine, Govt Mohan Kumaramangalam Medical College, Salem Tamilnadu, India.

**Arularasan Samraj** – <https://orcid.org/0000-0002-8700-851X>; Assistant Professor, Department of Orthopaedics, Govt Thiruvavur Medical College, Tamilnadu, India.

**Kayalvizhi Palanichamy** – <https://orcid.org/0000-0002-7540-3926>; Govt Thiruvavur Medical College, Tamilnadu, India.



## Introduction

Environmental sanitation is a major public health issue in India (Pandve, 2008). For every human being potable drinking water, sanitation and healthy hygiene practices are important to sustain healthy life. Most cities and towns in India are facing issues of dense settlement, shortage of water supply and inadequate facilities for disposal of human excreta (Ganesh et al., 2011; Nath, 2003). As our Father of the nation, M. K. Gandhi stated, "Sanitation is more important than Independence" and dreamt about clean India (Chaudhary, 2017). Adequate sanitation, together with good hygiene and safe water, is fundamental to good health and to social and economic development (Singh, 2008). The issues of developing understanding of the importance of maintaining sanitary and hygienic standards in public places were described in the study by Melnyk (2020). Among seven billion people in the world, about 2.5 billion people do not have access to improved sanitation and 1 billion people defecate in the open air (World Health Organization & United Nations Children's Fund (UNICEF), 2014). In developing regions where people are most vulnerable to infection, only one in every three people has access to improved sanitation (World Health Organization, & United Nations Children's Fund (UNICEF), 2017). Globally, around 2.4 million deaths (4.2% of all deaths) could be prevented annually if everyone practiced appropriate hygiene and had good, reliable sanitation and drinking water (Pruss-Ustun et al., 2008). In India, 53.0% of households or 600 million people defecate in open, out of which 69.3% belongs to rural areas and 18.6% belongs to urban areas (Gopal et al., 2009). Poor environmental sanitation, improper disposal of human excreta, and poor personal hygiene help to perpetuate and spread diarrheal diseases in India (Bhattacharya, 2003).

Swachh Bharat Abhiyan (SBA) was launched by the Prime Minister of India to accelerate the efforts for achieving universal sanitation. The core objectives of SBA are to bring about an improvement in the general quality of life in the rural areas (Ministry of Jal Shakti, 2017). To ensure adequate participation, community must be sensitized about the mission objectives and its role in bringing the desired change. With this background, this study was undertaken to assess knowledge, perception and practices regarding SBA among rural people of Thiruvavur district in Tamilnadu. *The aim of the study.* To assess the knowledge and perception regarding SBA among rural people of Thiruvavur, and to identify their pattern of practices regarding SBA prevailing in their community.

## Materials and Methods

A health center based, cross-sectional study was conducted in a rural setting Adiyakkamangalam village, District of Thiruvavur from April 2021 to September 2021. The study population included all males and females aged 20 years and above residing in this area. This area was selected as it is catered by the Department of Community Medicine, Govt Thiruvavur Medical College.

Sampling: Systemic random sampling.

At 95% confidence level and taking the awareness of SBA in rural area to be 62% (Kishore et al, 2018) and with a relative error of 10%, the sample size (n) comes out to be 240 using the formula (see Equation 1).

$$n = Z_{\alpha}^2 \times p \times q / L^2, \quad (1)$$

$Z_{\alpha}$  – value of the standard normal variate corresponding to level of significance alpha 5% (1.96);

p – awareness of SBA (0.62 or 62%);

q = 1 – p (0.38 or 38%);

L – allowable error (10%).

The sample size came to be 240. A total of 250 subjects were included in this study.

### Data Collection Procedure

A house-to-house survey was done in a rural area of Tamilnadu, village Adiyakkamangalam. Every third house was selected systematically, from each selected house all eligible individuals of 20 years, and above was included in the study. The study subjects were personally interviewed on face-to-face interview. For each study subject a questionnaire was administered. The purpose of this study was explained to each subject in the local language, before conducting the study and a written and informed consent was taken which was bilingual in English and Tamil.

The KAP of subjects toward SBA questionnaire items were rated and scored according to the following patterns.

For this study purpose, knowledge was scored: +1 was given for the correct answer and 0 for the incorrect answer. Scoring was done. Score 0-2 was considered as poor knowledge, 2-5 considered as average knowledge and more five as good knowledge. Attitude was also scored: +1 was awarded for positive attitude and 0 was awarded for negative attitude. Score less than 0-2 was termed as poor attitude, 2-5 as average and more than five was taken as good attitude.

### Statistical Analysis

Data entered and analysed in Statistical Package for Social Sciences (SPSS-IBM) software version 21. For qualitative variables proportions for quantitative variables mean, median, range and standard deviation was calculated. Bivariate analysis to find the association between determinants like education was done. P-value of <0.05 was considered as significant.

### Ethical consideration:

1. Informed written consent was taken from all study subjects. No pressure coercion was exerted on subjects for participation in the study.
2. Confidentiality and privacy was ensured at all stages (females were examined only in presence of one female attendant).
3. Institutional Ethical Committee clearance was obtained.
4. Safety COVID-19 precautions measures were strictly followed.



## Results

Our total study population consists of 250 subjects. Mean age group of my study population is 47.6+ 9.8

years. The minimum age of study participant is 21 years and maximum age is 68 years (Table 1).

**Table 1**

*Sociodemographic Profile of the Study Subjects*

Parameters	Categories	Frequency	
		people	%
Gender	Male	94	37.3
	Female	156	62.7
Religion	Hindu	206	82.4
	Muslim	38	15.2
	Christian	6	2.4
	Illiterate	99	39.6
Educational status	School	124	49.6
	Post school (diploma, graduate, postgraduate)	27	10.8
	Unemployed	33	13.2
Occupational status	Unskilled	122	48.8
	Semi-skilled	6	2.4
	Skilled	37	14.8
	Farmer / Shop	46	18.4
	Profession	6	2.4
Socio-economic status (BG Prasad classification)	I (Upper)	32	12.8
	II (Upper middle )	78	31.2
	III (Lower middle)	140	56.0
Type of family	Joint	167	66.8
	Nuclear	83	33.2

Most of the study population 29.6% fall under age category 21-30 followed by 24.0% in 51-60 age group, 22.0% in 31-40 age groups. Among the study population included in the study out of which 94 (37.3%) are males and 156 (62.7%) are females. Majority of the population of 206 (82.4%) samples comprises Hindu religion, 38 (15.2%) are Muslim, 6 (2.4%) are Christian.

Regarding their educational status and occupational status, 99 (39.6%) are illiterate, 120 (49.6%) have completed school education, 27 (10.8%) have completed graduation or diploma; and 33 (13.2%) are unemployed and 217 (86.8 %) are employed.

The socioeconomic status of the study subjects based on BG Prasad classification shows, most of them 140 (56.0%) belong to the lower middle, followed by 78 (31.2%) belong to the upper middle class, and 32 (12.8%) of the population belong to the upper class. Most of the study population 167 (66.8%) were nuclear family and 83 (33.2%) belong to joint family.

Table 2 shows knowledge regarding Swachh Bharat Abhiyan.

Most of them 226 (90.4%) have heard about this, the main objective of SBA was correctly answered by only 65 (26.0%), most of them 120 (48.0%) considered to eliminate open defecation free (ODF) as the main objective. The logo symbol of SBA was correctly known only to 126 (50.4%), half of them gave incorrect response. Most of them 160 (64.0%) did not know the name of our leader who was the inspiration of Swachh Bharat Mission (SBM), Mahatma Gandhi was quoted by only 58 (23.2%), followed by Nehru 12 (4.8%) then

Sardar Patel 12 (4.8%) and Modi 8 (3.2%). Clean India as main goal of SBM was given correctly by only 79 (31.6%), almost half of them 121 (48.4%) was not aware of this.

Most of them 183 (73.2%) are aware that ODF is a big threat to environment. Regarding major illness due to open-air defecation only 110 (44.0%) of them are aware about it, 80 (32.0%) of them told diarrhea as major illness followed by fever and cold. More than half of my study population 142 (56.8%) were aware that handwashing after defecation is only for self-hygiene. Regarding the sequence of events in defecation, 212 (84.8%) were aware about it. Knowledge regarding availability of community latrine is known to most 204 (81.6%) of them in this village.

Most of them 156 (62.4%) are aware that solid waste disposal (SWD) is a big threat to environment. Regarding major illness due to SWD, most of them 170 (68.0%) are aware about it, 30 (32.0%) of them told diarrhea as major illness followed by fever 36 (14.4%) and cold 14 (5.6%). Knowledge regarding availability of community dustbin is known to most 196 (78.4%) of them in this village. Regarding the logo of recycle only 132 (52.8%) were aware of this and only 106 (42.4%) were aware about the colour coded bins for disposal of waste.

Table 3 shows the perception about Swachh Bharat Abhiyan among respondents.



**Table 2**

*Knowledge Regarding Swachh Bharat Abhiyan among Study Population*

Knowledge questions	Frequency	
	people	%
1. Heard about Swachh Bharat Abhiyan		
Yes	226	90.4
No	24	9.6
2. Objectives of Swachh Bharat Abhiyan		
To eliminate open defecation free	120	48.0
To promote solid waste disposal	65	26.0
Both	65	26.0
3. Logo of Swachh Bharat Mission		
Correct response	126	50.4
Incorrect response	124	49.6
4. Inspiration of Swachh Bharat Mission		
Mahatma Gandhi	58	23.2
Jawharlal Nehru	12	4.8
Sardar patel	12	4.8
Narendra Modi	8	3.2
Don't know	160	64.0
5. Primary goal of Swachh Bharat Mission		
Green India	40	16.0
Smart India	10	4.0
Clean India	79	31.6
Don't know	121	48.4
<i>Open Air Defecation</i>		
6. Open air defecation is a threat to environment		
Yes	183	73.2
No	67	26.8
7. Major illness due to open defecation free		
Fever	44	17.6
Cold	16	6.4
Diarrhea	80	32.0
All of the above	110	44.0
8. Importance of hand washing after defecation		
For self-hygiene	142	56.8
For family hygiene	18	7.2
Both	90	36.0
9. Sequence of events in defecation		
Correct response	212	84.8
Incorrect response	38	15.2
10. Knowledge on availability of community latrine		
Yes	204	81.6
No	46	19.4
<i>Solid Waste Disposal</i>		
11. Improper disposal of waste is a threat to environment		
Yes	156	62.4
No	94	31.8
12. Major illness due to waste contamination		
Fever	36	14.4
Cold	14	5.6
Diarrhea	30	12.0
All of the above	170	68.0
13. Knowledge on availability of community dustbins		
Yes	196	78.4
No	54	21.6
14. Logo of recycle		
Correct response	132	52.8
Incorrect response	118	47.2
15. Heard about colour coded bins for waste disposal		
Yes	106	42.4
No	144	57.6





**Table 3**

*Perception of the Study Subjects*

Perception questions	Frequency	
	people	%
SBA is useful programme for the community		
Agree	192	76.8
Disagree	58	23.2
Open-air defecation acts as source of diarrhea disease due to flies		
Agree	122	48.8
Neither agree nor disagree	20	8.0
Disagree	108	43.2
Open-air defecation acts as source of diarrhea disease due to contaminated water		
Agree	163	65.2
Neither agree nor disagree	37	14.8
Disagree	50	20.0
Open-air defecation acts as source of diarrhea disease due to contaminated food		
Agree	92	36.8
Neither agree nor disagree	30	12.0
Disagree	128	51.2
Improper washing of hands after defecation can cause entry of pathogen		
Agree	195	78.0
Neither agree nor disagree	25	10.0
Disagree	30	12.0
Improper disposal of solid waste can contaminate water		
Agree	168	67.2
Neither agree nor disagree	22	8.8
Disagree	60	24.0
Improper disposal of waste can cause mosquitoes to breed		
Agree	194	77.6
Neither agree nor disagree	16	6.4
Disagree	40	16.0
All people must actively participate in SBA activities		
Agree	154	61.6
Neither agree nor disagree	12	4.8
Disagree	84	33.6
SBA is prorogated for political benefit		
Agree	174	69.6
Neither agree nor disagree	52	20.8
Disagree	43	17.2

Most of the respondents 192 (76.8%) agreed that SBA programme is useful to community and rest of them 58 (23.2%) do not agree to this statement. 122 participants (48.8%) think that open-air defecation can cause diarrhea due to flies, 163 participants (65.2%) – due to contamination of water, only 92 participants (36.8%) – due to contamination of food.

Most of them 195 (78.0%) of agree that improper washing of hands after defecation can cause entry of pathogen and cause infections. Only 168 (67.2%) of study participants agree to that improper disposal of waste can pollute water and 194 (77.6%) agree that improper disposal of waste can act as source of mosquito to breed. 154 (61.6%) of people agree to the statement that everyone should actively participate in SBA activities. Most of them 174 (69.6%) agree that SBA is propagated for political benefit.

Association between educational status and level of knowledge and perception among study subjects (Table 4) based on their response comes to statistically

significant as the education status increases the level knowledge and perception score regarding SBA increases.

Table 5 shows practices of Swachh Bharat Abhiyan among the study subjects.

Most of them 182 (72.8 %) have toilet facilities in home, still 62 (24.8%) prefer for open-air defecation and 72 (28.8%) use community latrines for open-air defecation. Practices regarding personal hygiene, only 58.0% have the habit of handwashing after defecation, 92.4% do not use soap and water for cleaning hands, only 1.2% practice proper steps of handwashing. Only 56.8% use community dustbins for SWD, 67.2% prefer to throw garbage in and around house premise. Community participation is only 81 (32.4%) in SBA related activities and almost everyone 238 (95.2%) agreed to motivate people in participation of SBA related activities.



**Table 4**

*Association between Educational Status and Level of Knowledge and Perception among Study Subjects*

Educational status	Knowledge, people (%)			Perception, people (%)		
	Good	Average	Poor	Good	Average	Poor
Illiterate	52 (47.3)	30 (26.5)	17 (15.0)	70 (63.6)	16 (14.2)	13 (15.0)
Up to High school	66 (58.4)	37 (33.6)	21 (19.1)	80 (70.8)	23 (20.9)	21 (15.5)
Graduate	24 (88.9)	3 (11.1)	-	24 (88.9)	3 (11.1)	-
P< 0.05*			P< 0.05*			

Note. \*p<0.05 significant by applying Chi Square test

**Table 5**

*Practices of Swachh Bharat Abhiyan among the Study Subjects*

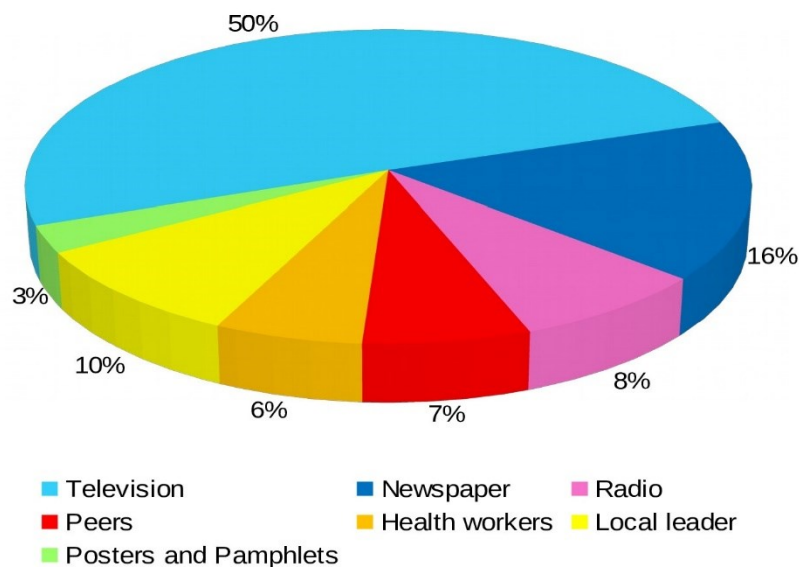
Component	Compliance	Frequency	
		people	%
Subjects having toilet facilities in house	Yes	182	72.8
	No	68	27.2
Subjects preferring open defecation free	Yes	62	24.8
	No	188	75.2
Using community sanitary latrines for defecation	Yes	72	28.8
	No	178	71.2
Proper handwashing after going to latrines	Yes	145	58.0
	No	155	42.0
Using both soap and water after defecation	Yes	19	7.6
	No	231	92.4
Practicing proper steps of handwashing	Yes	3	1.2
	No	247	98.8
Using community bin for solid waste disposal	Yes	142	56.8
	No	108	44.2
Throwing of garbage waste in nearby places	Yes	168	67.2
	No	82	33.8
Participated in SBA activities	Yes	81	32.4
	No	169	67.6
Motivate people to participate in SBA activities	Yes	238	95.2
	No	12	4.8

Television and Newspaper were found to be the main source of information about SBA (Figure 1): 126

participants (50.4%) and 41 participants (16.4%) accordingly.

**Figure 1**

*Distribution of Source for Information*



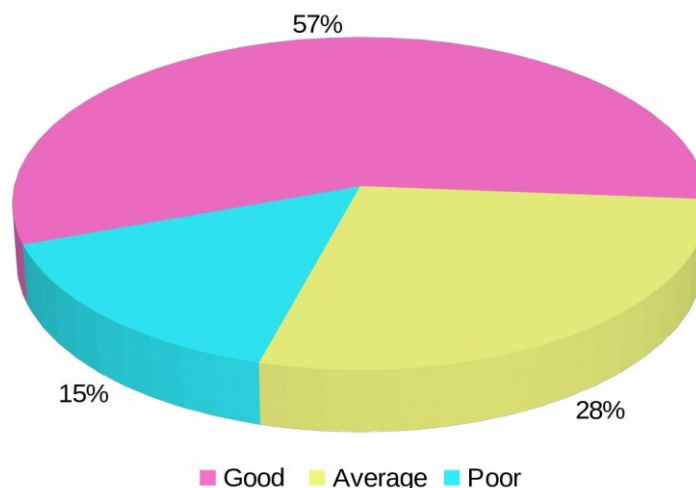


More than half of the study participants 142 (56.8%) had good knowledge score >5, others 70 (28.0%) had

average knowledge and 38 (15.2%) had poor knowledge (Figure 2).

**Figure 2**

*Distribution of Knowledge Score Assessment*

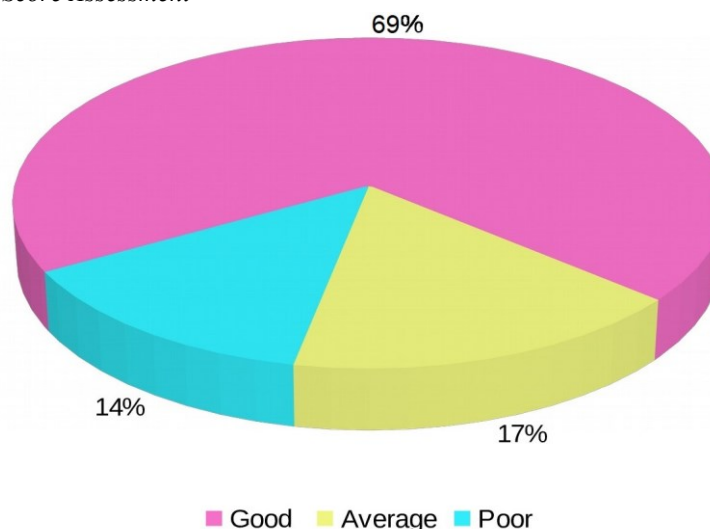


More than half of the study participants 174 (69.6%) have good perception score >5, others 42 (16.8%) have

average perception and 34 (13.6%) have poor perception (Figure 3).

**Figure 3**

*Distribution of Perception Score Assessment*



## Discussion

In the present study, majority of the respondents belonged to 21-30 years' age group (29.6%). Mean age was  $47.6 \pm 9.8$ ; were females 156 (62.7%), and were Hindus 206 (82.4%). Most of them lived in joint family 167 (66.8%). Regarding educational status 99 (39.6%) were illiterate, and rest were literate, only 33 (13.2%) were unemployed rest of them were employed, majority belonged to Socioeconomic Status (SES) Class II and Class III as per BG Prasad Classification updated.

In a similar study conducted in Jharkhand (Asian Development Research Institute, 2017), it was found that 39.0% of their study participants belonged to 21-30 years' age group. Majority were female participants (76.0%) and 34.0% were illiterates.

Another study in Nalgonda district, Telangana (Kishore et al., 2018) showed that 29.6% belonged to 21-30 years' age group, with predominantly female participants (56.1%), 96.6% was Hindus, 62.5% were literates, and 38.4% belonged to middle class similar to our study.

In another study done in Karnataka (Jeratagi et al., 2017), most of them (49.2%) belonged to SES Class IV followed by Class V (42.8%), where as in the present study, no one belonged to SES Class V.

The present study revealed that most of the respondents 226 (90.4%) had heard about SBA, which is similar to the studies 91.31% (Pradhan, 2017) and 93.62% were aware of SBA (Asian Development Research Institute, 2017).



Others studies done in Nalgonda districts that 204 (62.2%) out of 328 participants have heard about SBA (Kishore et al., 2018). In a study, conducted in Uttar Pradesh and Madhya Pradesh, was found that only 24.0% of their study participants were aware of SBA, which was quite low as compared to the present study (Swain & Pathela, 2016).

In the present study, out of 226 subjects who were aware about SBA, majority 165 (82.84%) of them have identified both eliminating open field defecation and promoting proper solid waste disposal as objectives of SBA, which is similar to this study (Kishore et al., 2018). Present study stated that 50 (95%) of the study subjects have identified eliminating open field defecation as one of the objective of SBA which is low compared to the findings in another study 93.0% (Asian Development Research Institute, 2017). 65.0% of the subjects in our study knew that promoting proper solid waste disposal as one of the objectives of SBA, where this is 87.7% (Kishore et al., 2018) and 62.3% (Asian Development Research Institute, 2017).

In our study most of them 183 (73.2%) are aware that ODF is a big threat to environment. Regarding major illness due to open-air defecation only 110 (44.0%) of them are aware about it, 80 (32.0%) of them told diarrhea as major illness followed by fever and cold. In a study conducted in rural areas of Tamilnadu a majority 87.2% (Anuradha et al., 2017) did not know that diseases could be spread due to the practice of open-air defecation, which is consistent with our study. However, in a study only a few out of the sample population (14.5%) were not aware of the harmful effects of open-air defecation (Geeta & Kumar, 2014).

More than half of my study population 142 (56.8%) were aware that handwashing after defecation is only for self-hygiene and 212 (84.8%) were aware about the sequence of events in defecation. Knowledge regarding availability of community latrine is known to most 204 (81.6%) of them in this village. However, similar other studies reported much higher prevalence of handwashing with soap after defecation by 69.8% (Kishore et al., 2018). In another study, 89.0% of their study participants used to wash their hands before eating and 92.0% of them washed after defecation (Swain & Pathela, 2016).

In our study most of them 156 (73.2%) are aware that SWD is a big threat to environment. Similarly, 74.7% respondents were aware solid waste management as very important (Usha et al., 2020).

Regarding major illness due to SWD, most of them 170 (68.0%) of them are aware about it. Knowledge regarding availability of community dustbin is known to most 196 (78.4%) of them in this village.

Television 126 (50.4%) and newspaper 41 (16.4%) were found to be the main source of information about SBA. Similar results television (84.31%) and newspaper (39.21%) were found to be the main source of information (Kishore et al., 2018).

Present study found that 76.8% of the subjects felt that SBA is a useful programme for the community. In another study 76.1% of the subjects agreed that SBA helps in the development of the country and 54.3%

agreed that SBA has brought changes on the ground level (Pradhan, 2017).

In another study conducted in Pune, it was found that 80.4% subjects thought that there is need of SBA and 72.8% felt that SBA is effective (Anuradha et al., 2017). These findings reflect the positive perception of the community towards SBA. In another study found that 85.8% of the subjects felt that SBA is a useful programme for the community (Kishore et al., 2018).

Current study revealed that only 61.6% of the study subjects thought that all the people must actively participate in SBA activities. In similar study, done by Kishore et al. (2018), found 75.6% of the subjects wanted to participate.

Though majority of the participants had positive attitude, interestingly 69.6% felt that political benefits is other side of the coin for propagating SBA which is higher when compared to (Kishore et al., 2018).

Most of them 182 (72.8%) have toilet facilities in home, still 62 (22.0%) prefer for open-air defecation and 72 (28.8%) use community latrines for ODF.

The study conducted at Nalgonda district reported 26.5% as prevalence of open-field defecation, similar to the study findings 33.1% by Anuradha et al. (2017) and 17.0% by Kuberan et al. (2015).

Practices regarding disposal of household solid waste in community dustbins in the present study were 58.2%, 67.2% prefer to throw garbage's in and around house premises.

Although similar study reported even higher proportion (61.0%) of waste disposal at appropriate sites (community dustbins and dump trucks), still 39.0% of them indiscriminately threw the waste (Yaoda et al., 2014), which is slightly higher than the present study (32.4%). Only 4.0% were utilizing community dustbins and most of them (83.0%) disposed household waste in open field (Swain & Pathela, 2016).

Community participation is only 81 (32.4%) in SBA related activities and almost everyone 238 (95.8%) agreed to motivate people in participation of SBA related activities. Only 26.0% of the subjects have participated in SBA activities; however, 59.3% of the participants would like to motivate people to participate in SBA activities (Kishore et al., 2018). Contrast findings were observed in report (Asian Development Research Institute, 2017) which showed that 94.0% subjects have participated in SBA.

Practices regarding personal hygiene, only 58.0% have the habit of handwashing after defecation, 92.4% do not use soap and water for cleaning hands. Contrasting findings were observed 83.0% by Kuberan et al. (2015) and 82.0% by Jeratagi et al. (2017).

## Conclusions

The present study found that majority of the subjects were aware of SBA and its objectives were known only less subjects and most of them were having positive attitude and perception towards SBA. Though most of the people were having positive perception only 32.4% have participated in SBA activities and the main source of information was found to be television and newspaper.





24.8% of the subjects preferred open field defecation and 56.8% of the subjects were disposing solid waste in community bins. The proportion of people disposing solid waste in community bins and using soap and water for handwashing was significantly higher among people who were aware about SBA. Increasing awareness regarding health hazards of open-air defecation and improper disposal of waste will create a change in their behavior in adopting healthy lifestyle. Planning and conducting Information Education Communication activities on this important issue on a regular basis is extremely necessary. Effective political and administrative support is needed to scale up the sanitation program.

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### Ethical Approval

Institutional Ethical Committee approval was obtained from the institution, No. 012/IEC/GTMC/2019 from 03/05/2019.

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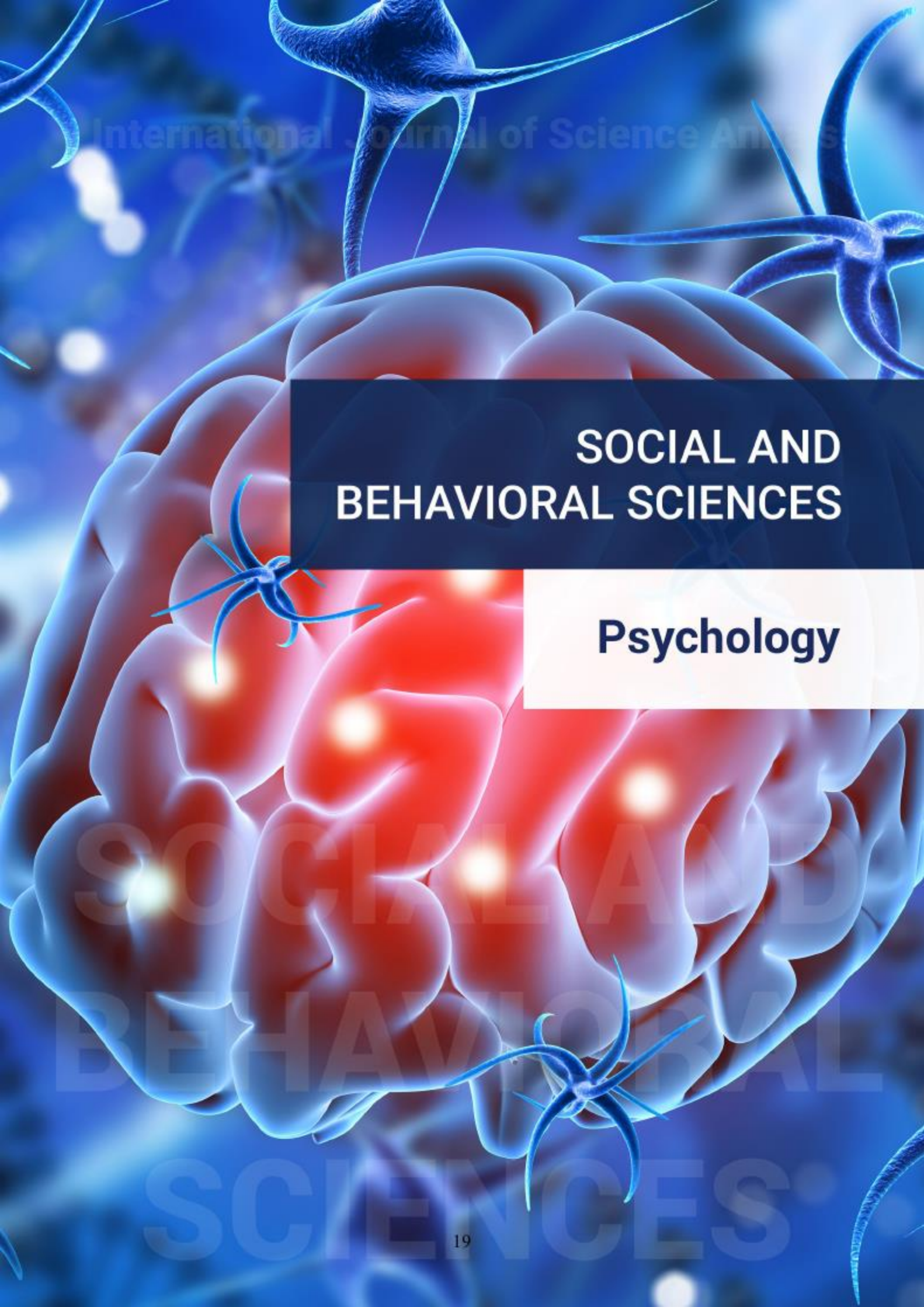
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# **SOCIAL AND BEHAVIORAL SCIENCES**

**Psychology**



## SOCIAL AND BEHAVIORAL SCIENCES. Psychology

### ORIGINAL RESEARCH



# Psychological Distress among Students and Cadets of Universities in the War Conditions



#### Authors' Contribution:

- A – Study design;
- B – Data collection;
- C – Statistical analysis;
- D – Data interpretation;
- E – Manuscript preparation;
- F – Literature search;
- G – Funds collection

Stadnik A. V.<sup>1,4 ABCDEG</sup> , Melnyk Yu. B.<sup>2,3 ADEFG</sup> ,  
Babak S. A.<sup>1 B</sup> , Vashchenko I. V.<sup>1 B</sup> , Krut P. P.<sup>1 B</sup>

<sup>1</sup> Kharkiv National University of Internal Affairs, Ukraine

<sup>2</sup> Kharkiv Regional Public Organization "Culture of Health", Ukraine

<sup>3</sup> Scientific Research Institute KRPOCH, Ukraine

<sup>4</sup> Social-Psychological Center KRPOCH, Ukraine

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#### Background and Aim of Study:

#### Abstract

The full-scale military aggression against Ukraine in February 2022 had an extremely negative impact on the psyche of its residents. This is especially felt by young people who should continue studying at universities in these difficult conditions.

The aim of the study: to identify the specifics of psychotraumatic impact in the conditions of war and martial law on university students and cadets, to detail their level of stress, anxiety and depression.

#### Material and Methods:

The study was conducted in November 2022 based on KNUA, Ukraine. Respondents aged 20-27 were divided into 3 groups: 1) 115 cadets: 85.22% men and 14.78% women, who are outside of permanent deployment; 2) 107 students: 59.81% men and 40.19% women, who are forcibly displaced persons in Ukraine and abroad; 3) 103 students: 50.49% men and 49.51% women, located in Kharkiv and Kharkiv region. A Google-form questionnaire was used to study the level and nature of psychotraumatization. Data collection on the level of stress and its content was carried out using the DASS-21 tool.

#### Results:

Among the group 3 respondents, the psychotraumatic impact is characterized by high tension and the specific weight of vital psychogenia. Severe and extremely severe manifestations of anxiety in group 3 students were 2-3 times higher than the similar indicators of groups 1, 2 respondents. Manifestations of depression among women are the highest in group 3 respondents. Stress was more expressed among men in all groups. Group 3 respondents had the highest stress (distress) indicators among men.

#### Conclusions:

The negative impact of the war in Ukraine on the student youth' mental health requires the active implementation of psychological assistance and psychoprophylaxis measures in accordance with the individual results of psychodiagnostics.

#### Keywords:

mental health, psychotraumatic impact, anxiety, depression, stress, students, war

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#### Information about the authors:

**Stadnik Anatoliy Volodymyrovych** (Corresponding Author) – <https://orcid.org/0000-0002-1472-4224>; stav1963@ukr.net; Doctor of Philosophy in Medicine, Associate Professor, MD, Kharkiv National University of Internal Affairs; Director, Social-Psychological Center KRPOCH, Ukraine.  
**Melnyk Yuriy Borysovych** – <https://orcid.org/0000-0002-8527-4638>; Doctor of Philosophy in Pedagogy, Associate Professor; Chairman of Board, Kharkiv Regional Public Organization "Culture of Health" (KRPOCH); Director, Scientific Research Institute KRPOCH, Ukraine.





**Babak Serhiy Anatoliyovych** – <https://orcid.org/0000-0002-2248-454X>; Doctor of Philosophy in Military Science, Senior Researcher, Head of the Department of Military Training, Kharkiv National University of Internal Affairs, Ukraine  
**Vashchenko Ihor Vladyslavovych** – <https://orcid.org/0000-0002-1444-7538>; Doctor of Philosophy in History, Associate Professor, Kharkiv National University of Internal Affairs, Ukraine  
**Krut Petro Pavlovych** – <https://orcid.org/0000-0003-4554-7870>; Doctor of Philosophy in Philosophy, Associate Professor, Kharkiv National University of Internal Affairs, Ukraine

## Introduction

In February 2022, the Russian army invaded the territory of Ukraine and started a military aggression. As a result, martial law was declared in Ukraine. Violation of the mental health of the population during the war is a well-known problem. War and martial law have a negative impact on the psyche of an individual because they are traumatic in their essence.

Thus, according to the latest research results (Gradus Research, 2022), about 42% of Ukrainian citizens complain of a feeling of tension, and 41% of a feeling of fatigue. 72% of the population of Ukraine call war the most frequent cause of stress.

One of the risk groups and psychological problems in war and martial law conditions is youth, including students. During the war, young people are affected by the following psychogenic factors: physical, mental and information-psychological overload, personal danger and the danger of loved ones, loss of income source or job, loss of home and property, risk of death, etc. All this leads to the emergence of such psychological disorders as anxiety, depression, post-traumatic stress disorder, etc. (Gradus Research, 2022).

As Joshi and O'Donnell (2003) note, mental disorders in war are actually "normal response to abnormal events". This makes it necessary to study the influence of psychogenic factors of war on youth studying at universities and to analyze mental disorders during the war among all categories of students.

*The aim of the study.* To identify the specifics of psychotraumatic impact in war and martial law conditions on university students and cadets, to detail their level of stress, anxiety and depression for the development of psychological assistance and psychoprophylaxis measures.

## Materials and Methods

The study was conducted in November 2022 during the Russian-Ukrainian war.

The respondents of the study were cadets and students studying at the Department of Military Training of the Kharkiv National University of Internal Affairs (KNUIA), Ukraine. The age of the researched was 20-27 years.

We separated three groups from them:

Group 1 is the KNUIA cadets who are outside the borders of permanent deployment on the territory of Ukraine. The group consisted of 115 people, including 98 (85.22%) men and 17 (14.78%) women.

Group 2 is the KNUIA students who are forcibly displaced persons and are in the territory of Ukraine or

outside its borders. The group consisted of 107 people, including 64 (59.81%) men and 43 (40.19%) women.

Group 3 is the KNUIA students who did not change their place of permanent residence during the war and are located in the territory of Kharkiv and Kharkiv region. The group consisted of 103 people, including 52 (50.49%) men and 51 (49.51%) women.

To study the level and nature of psychotraumatization of the KNUIA cadets and students in war and martial law conditions, we used an online questionnaire based on standard Google-forms. We developed it in accordance with the objectives of this research and made public (KNUIA Department of Military Training & KRPOCH, 2022).

The questionnaire is anonymous and consists of 17 questions related to the place of study, gender, age, region of residence and factors of psychological traumatization of the individual in war conditions.

Data collection on the stress level and its content was carried out using the Depression Anxiety Stress Scales (DASS-21) tool. The research was conducted using online networks: Telegram, Facebook, WhatsApp, etc. by sending a questionnaire to respondents. In addition, observation was carried out in all groups during remote and face-to-face classes.

DASS-21 tool (short form DASS, 21 questions) is designed to measure negative emotional states of depression, anxiety and stress. The DASS subscales were evaluated according to the technique (Psychology Foundation of Australia, 2022). The number of cadets and students with normal, minor, moderate, severe and extremely severe symptoms was assessed. According to the "Depression" / "Anxiety" / "Stress" scales, the manifestations of the indicators are: normal (0-3/0-4/0-7 points), minor (5-6/4-5/8-9 points), moderate (7-10/6-7/10-12 points), severe (11-13/8-9/13-16 points), extremely severe (14+/10+/17+). The average score on the scales was calculated as the arithmetic mean of the indicators. The advantage of this technique is its universality, as it is suitable for clinical and non-clinical conditions (Henry & Crawford, 2005).

## Results

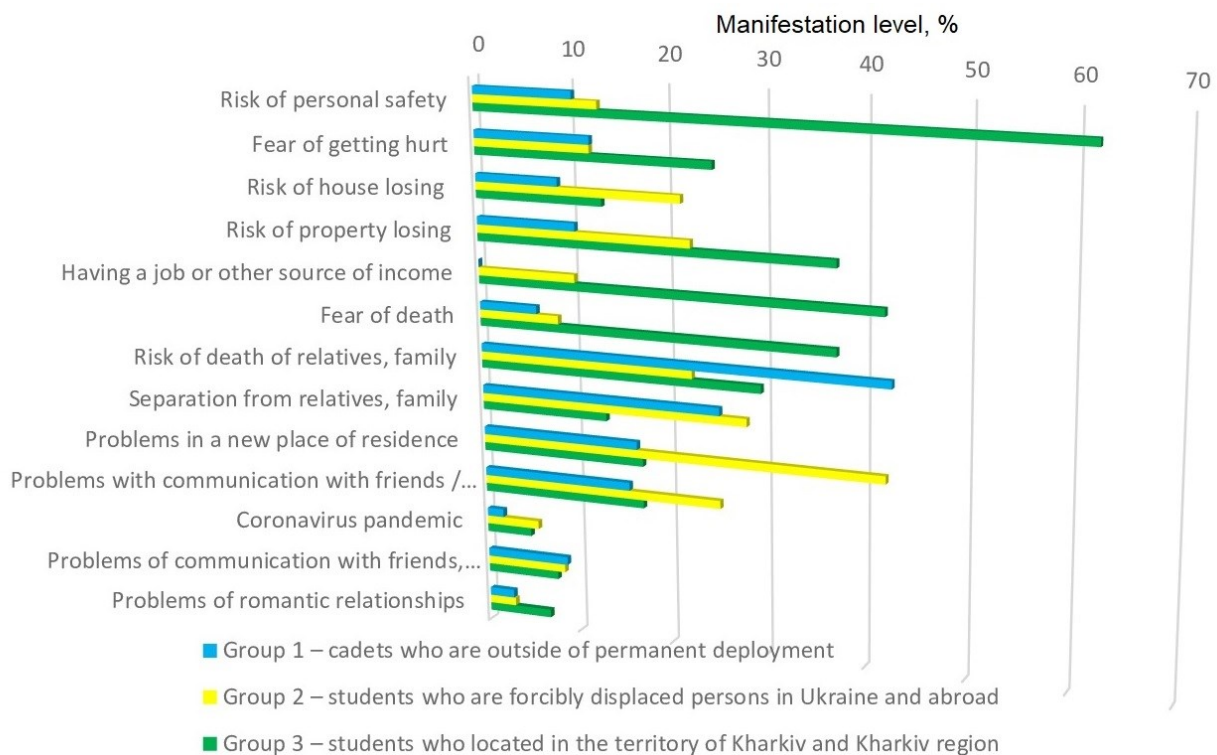
Assessments of the level and nature of psychotraumatization of the KNUIA cadets and students in the war and martial law conditions were found using an online questionnaire (KNUIA Department of Military Training & KRPOCH, 2022). The results are presented in Table 1 and Figure 1.



**Table 1**  
*Psychogenic Factors Affecting to Respondents*

Factors	Group 1 (n=115, including 98 male, 17 female)						Group 2 (n=107, including 64 male, 43 female)						Group 3 (n=103, including 52 male, 51 female)					
	total	%	male	%	female	%	total	%	male	%	female	%	total	%	male	%	female	%
Risk of personal safety	12	10.4	9	9.2	3	17.7	14	13.1	6	9.4	8	18.6	65	61.9	26	50.0	39	76.5
Fear of getting hurt	14	12.2	12	12.2	2	11.8	13	12.2	7	10.9	6	14.0	26	24.8	18	34.6	8	15.7
Risk of house losing	10	8.7	6	6.1	4	23.5	23	21.5	11	17.2	12	27.9	14	13.3	6	11.5	8	15.7
Risk of property losing	12	10.4	9	9.2	3	17.7	24	22.4	12	18.8	12	27.9	39	37.1	21	40.4	18	35.3
Having a job or other source of income	0	0.0	0	0.0	0	0.0	11	10.3	7	10.9	4	9.3	44	41.9	39	75.0	5	9.8
Fear of death	7	6.1	6	6.1	1	5.9	9	8.4	3	4.7	6	14.0	39	37.1	17	32.7	22	43.1
Risk of death of relatives, family	49	42.6	36	36.7	13	76.5	24	22.4	13	20.3	11	25.6	31	29.5	14	26.9	17	33.3
Separation from relatives, family	29	25.2	17	17.4	12	70.6	30	28.0	12	18.8	18	41.9	14	13.3	5	9.6	9	17.7
Problems in a new place of residence	19	16.5	11	11.2	8	47.1	45	42.1	28	43.8	17	39.5	18	17.1	12	23.1	6	11.8
Problems with communication with friends / loved ones	18	15.7	14	14.3	4	23.5	27	25.2	15	23.4	12	27.9	18	17.1	8	15.4	10	19.6
Coronavirus pandemic	2	1.7	1	1.0	1	5.9	6	5.6	3	4.7	3	7.0	5	4.8	2	3.9	3	5.9
Problems of communication with friends, acquaintances	10	8.7	8	8.2	2	11.8	9	8.4	5	7.8	4	9.3	8	7.6	5	9.6	3	5.9
Problems of romantic relationships	3	2.6	2	2.0	1	5.9	3	2.8	2	3.1	1	2.3	7	6.7	5	9.6	2	3.9

**Figure 1**  
*The Level of Manifestation of Psychogenic Factors According to Three Groups of Respondents*





Based on the obtained results, it was established that for group 1 of respondents (cadets), the most important factors of mental trauma are the risk of death of relatives, family (42.61%), separation from relatives, family (25.22%), and problems of adaptation to a new place of residence (16.52%).

For group 2 of respondents (students who are in the territory of Ukraine and beyond), problems of adaptation to a new place of residence are relevant (42.06%), separation from relatives, family (28.04%), problems with communication with friends/relatives (25.23%).

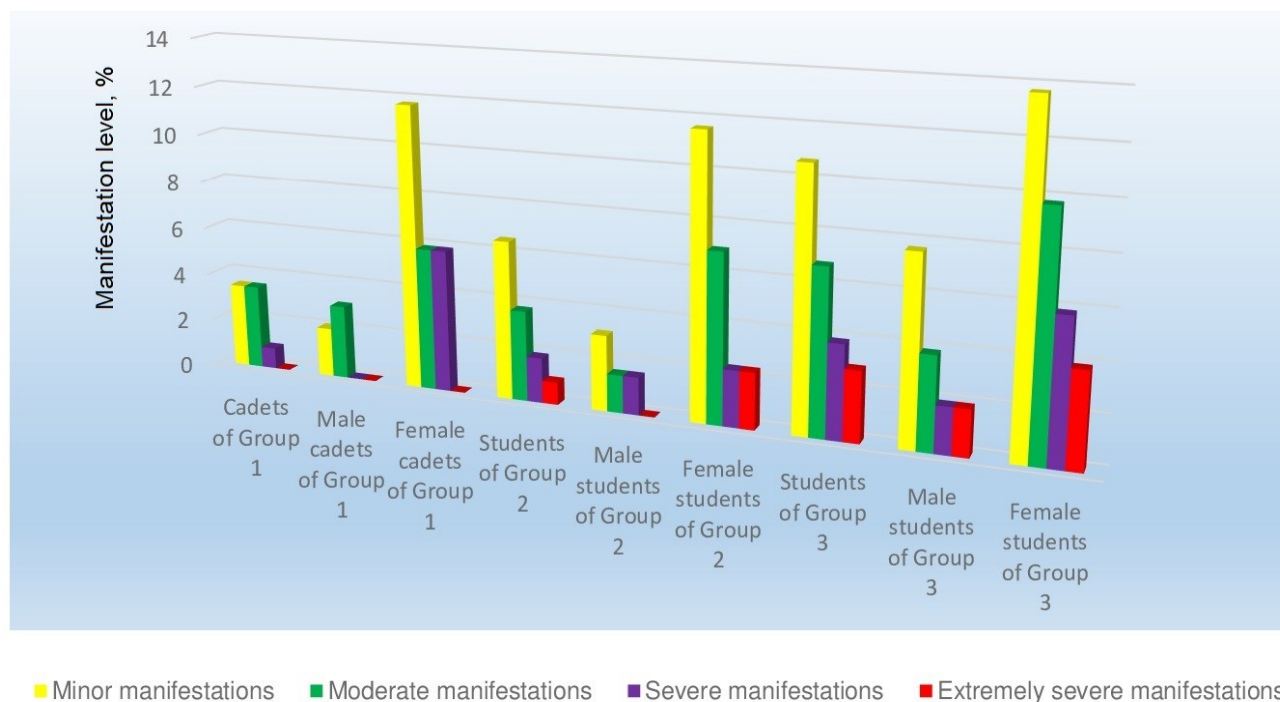
At the same time, for group 3 respondents (students located in Kharkiv region), the indicators of mental trauma were higher than other groups and included the following: personal safety risk (61.90%), lack of work or other source of income (37.14%), fear of death and risk of property loss (37.86%). The high specific weight of vital psychogenia among the respondents of group 3 is explained by the complex military-humanitarian situation and essentially inhuman conditions of existence in Kharkiv and the region (daily rocket attacks, frequent stays in shelters, lack of light, water and heat in some areas, deaths and injuries of the population from shelling and anti-personnel mines, etc.).

The smallest specific weight for group 3 respondents is the following psychogenies: the coronavirus pandemic and romantic relationship problems, which do not exceed 5-6%.

The significance of the problems of living in a new place for the respondents of groups 1 (42.06%) and 2 (16.52%) is explained by a certain uncertainty of the situation regarding the duration of the war in Ukraine and the deterioration of the life quality in the new place. The relevance of problems with communication with friends/relatives for groups 2 (25.23%) and 1 (15.65%) is caused both by their significance for respondents and the importance of communication using mobile and Internet communication for young people in general. It is related to the dissemination of socially significant information, which is a cognitive resource in the process of forming ideas, opinions, value orientations and adequate behavior. Therefore, the violation of mobile and Internet communication after the Russian shelling of Ukraine is always perceived sensitively by the youth. Further detailing of symptoms of mental trauma was carried out using the DASS-21 tool.

Manifestations of anxiety among the KNUIA cadets and students in the war and martial law conditions are shown in Figure 2.

**Figure 2**  
*The Level of Manifestation on Anxiety among Respondents*



Based on the research conducted using the DASS-21 tool, we found the following quantitative results on the "Anxiety" scale.

For respondents of group 1: the absence of anxiety symptoms was observed in 92.17% of people, minor and moderate manifestations of anxiety appeared in 3.48% of people, severe – in 0.87% of people, and a critical level of anxiety was not observed.

For group 2 respondents: the absence of anxiety symptoms was observed in 86.92% of servicemen, minor – in 6.54%, moderate – in 3.74%, severe manifestations of anxiety were observed in 1.87% of people, and extremely severe manifestations of anxiety appeared in 1 (0.93%) student.

For the respondents of group 3, severe (3.88%) and extremely severe (2.91%) manifestations of anxiety



were 2-3 times higher than similar indicators of groups 1 and 2.

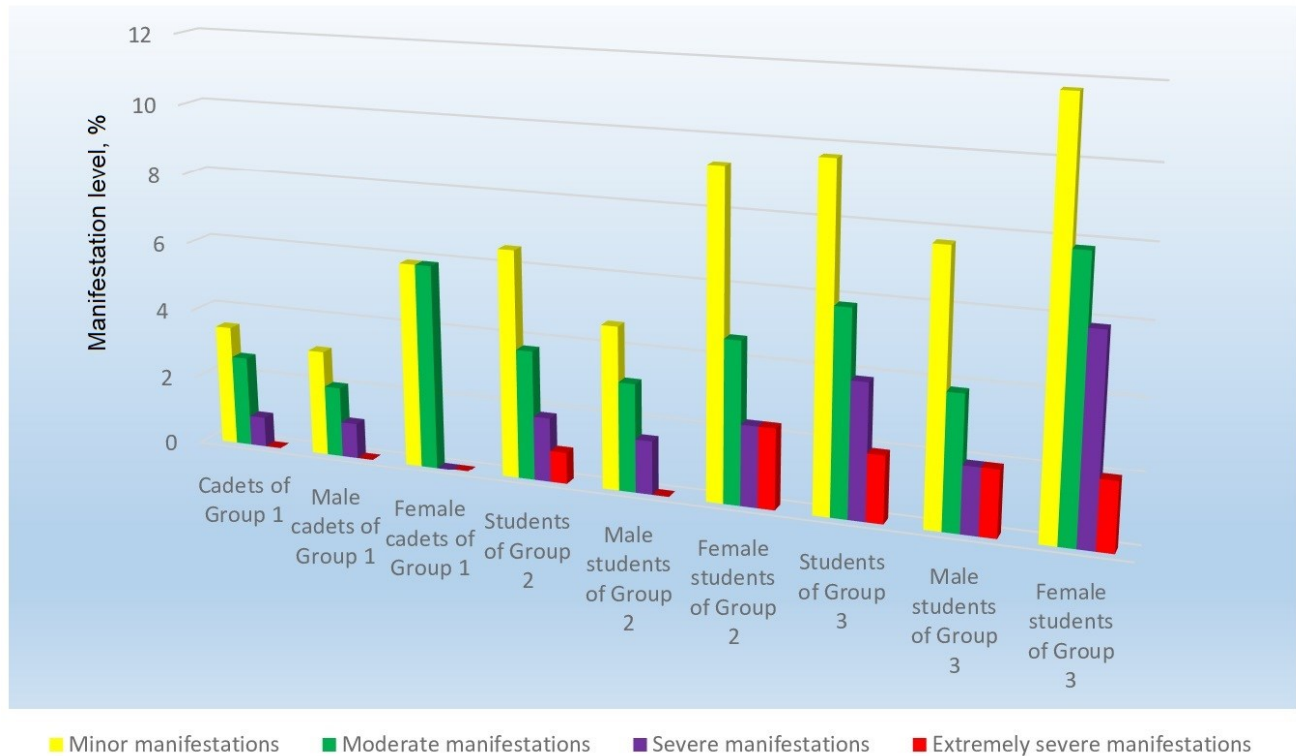
It should be noted that, according to the results of the study, anxiety is more pronounced in women of all groups. The absence of anxiety symptoms was observed only in 66.67% of women in group 3, 76.74% and

76.47% of women in groups 2 and 1. At the same time, similar indicators for men in groups 3, 2, 1 were 84.62%, 93.75%, 94.90%, respectively.

Manifestations of depression among the KNUIA cadets and students in the war and martial law conditions are shown in Figure 3.

**Figure 3**

*The Level of Manifestation on Depression among Respondents*



According to the “Depression” scale, the absence of depressive symptoms was observed in respondents of group 1 (93.04%), group 2 (86.92%) and group 3 (78.64%). Minor manifestations of depression were observed in 3.48% of group 1 respondents, in 6.54% of group 2 respondents, and in 9.71% of group 3 respondents. Moderate manifestations of depression in respondents of group 1 amounted to 2.61%, which is significantly less than in respondents of groups 2 (3.74%) and 3 (5.83%). Severe depression was present in 1.87% and 3.88% of students of groups 2 and 3, which is significantly higher than the indicators of cadets in group 1 (0.87%). Extremely severe manifestations of depression were not observed in the cadets of group 1, while they were observed in students of groups 2 (0.93%) and 3 (1.94%).

Gender characteristics: depression is more pronounced in women of groups 2 and 3. The rate of absence of depression in women of groups 2 (81.40%) and 3 (88.24%) is less than similar indicators for men in groups 2 and 3: 93.02% and 94.12% respectively. Among male cadets of group 1 (94.12%), the rate of absence of depression is slightly higher than among females (88.24%).

Manifestations of stress among the KNUIA cadets and students in the war and martial law conditions are shown in Figure 4.

The study indicators according to the “Stress” scale for group 1 are as follows: absence of stress symptoms was observed in 93.91% of cadets; minor manifestations of stress were observed only in 3.48% of people; moderate manifestations in 1.74% of people; they were severe in 0.87% of people.

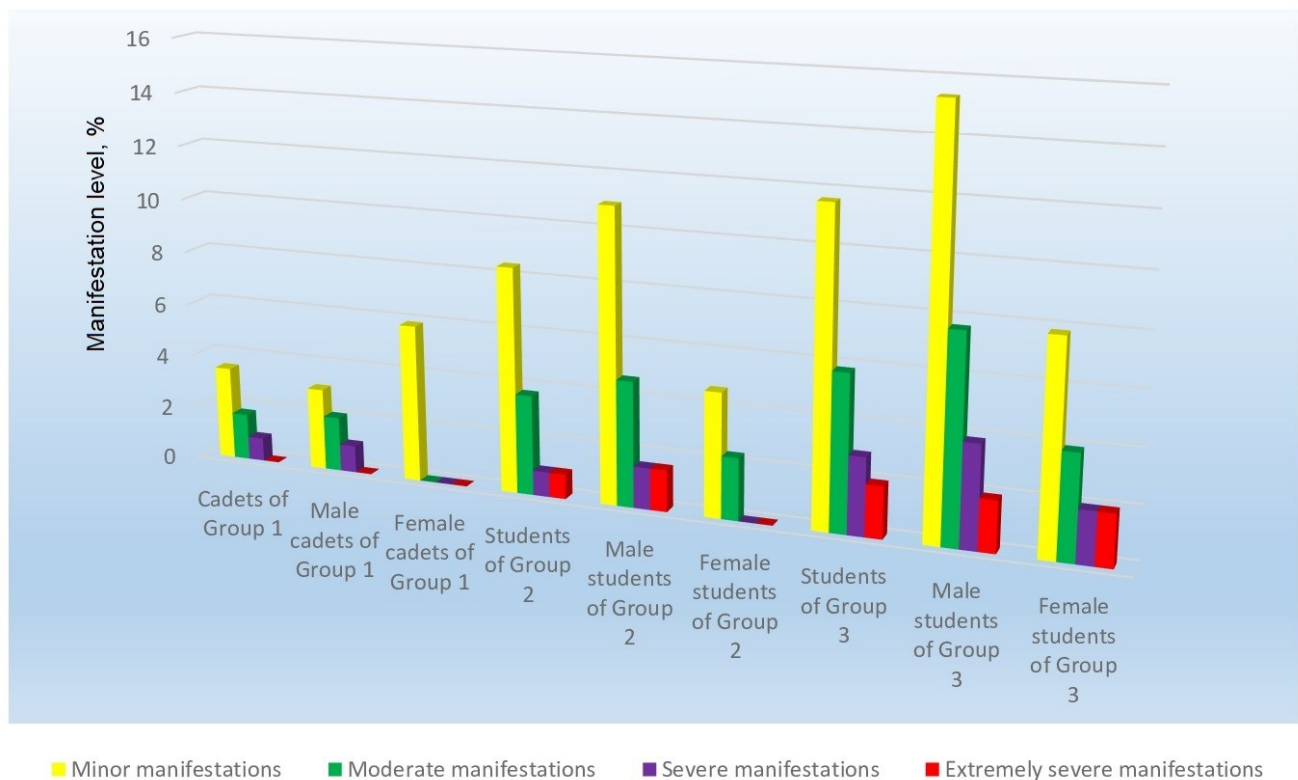
For students of group 2, the indicators were slightly higher: minor manifestations of stress were observed in 8.41% of people, moderate manifestations in 3.74%, severe and extremely severe manifestations (distress) in 0.93% of people.

Group 3 of students had the highest indicators: minor manifestations of stress were observed in 11.65% of people; moderate manifestations in 5.83% of people; severe manifestations in 2.91%, extremely severe manifestations (distress) in 1.94% of people.

It should be noted that according to the results of the study, stress was more pronounced among men compared to women in all groups. Moreover, the highest indicators of stress (distress) among men were among male students of group 3. The absence of stress symptoms was observed in 71.15% of men in group 3, 81.25% in group 2, and 93.88% in group 1. Similar indicators for women of groups 3, 2 and 1 were 84.31%, 93.02%, 94.12%, respectively.



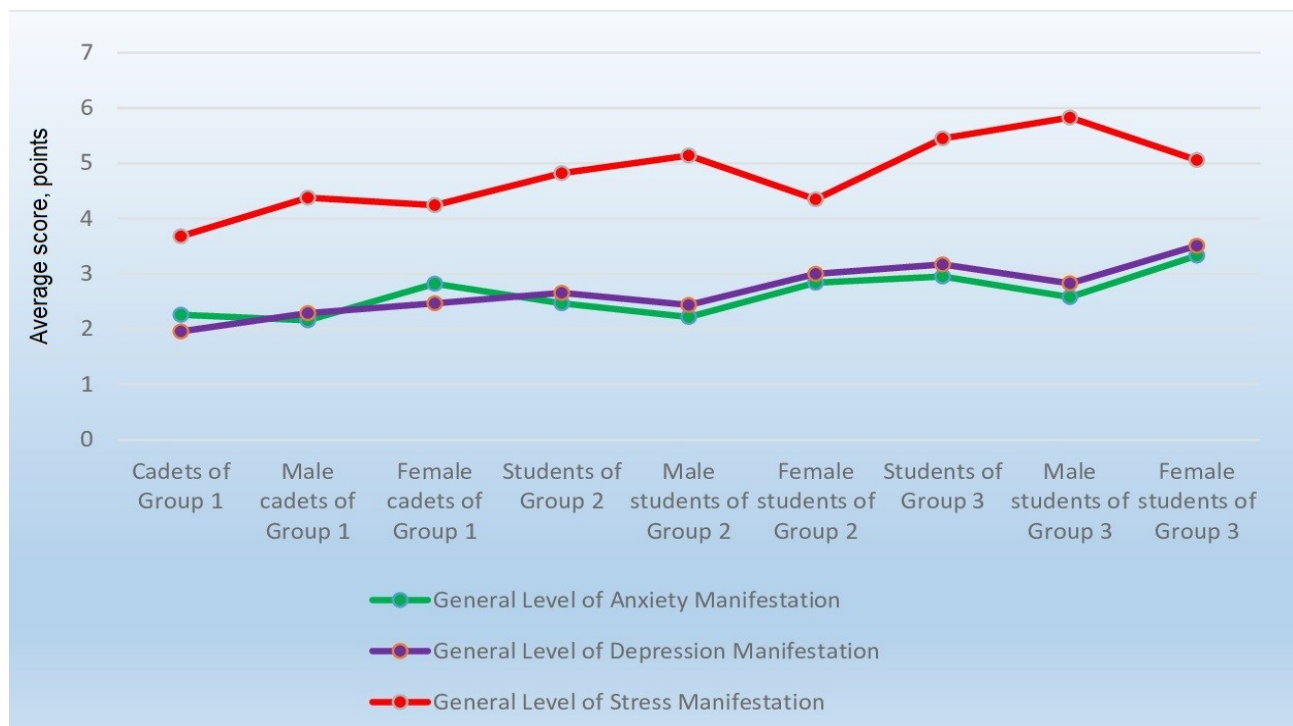
**Figure 4**  
*The Level of Manifestation on Stress among Respondents*



The general indicators of anxiety, depression and stress among the KNUIA cadets and students in the war and

martial law conditions are shown in Figure 5 and Table 2.

**Figure 5**  
*The Level of Manifestation on the General Indicators of Anxiety, Depression and Stress among Respondents*





**Table 2**

*Manifestations of Anxiety, Depression and Stress among the Respondents*

Manifestation level	Group 1 (n=115, including 98 male, 17 female)						Group 2 (n=107, including 64 male, 43 female)						Group 3 (n=103, including 52 male, 51 female)					
	total	%	male	%	female	%	total	%	male	%	female	%	total	%	male	%	female	%
Absent	106	92.17	93	94.90	13	76.47	93	86.92	60	93.75	33	76.74	78	75.73	44	84.62	34	66.67
Minor	4	3.48	2	2.04	2	11.76	7	6.54	2	3.13	5	11.63	11	10.68	4	7.69	7	13.73
Moderate	4	3.48	3	3.06	1	5.88	4	3.74	1	1.56	3	6.98	7	6.80	2	3.85	5	9.80
Severe	1	0.87	0	0.00	1	5.88	2	1.87	1	1.56	1	2.33	4	3.88	1	1.92	3	5.88
Extremely severe	0	0.00	0	0.00	0	0.00	1	0.93	0	0.00	1	2.33	3	2.91	1	1.92	2	3.92
Average score (Anxiety)	2.26		2.18		2.71		2.47		2.22		2.84		2.95		2.58		3.33	
Absent	107	93.04	92	93.88	15	88.24	93	86.92	58	90.63	35	81.40	81	78.64	44	84.62	37	72.55
Minor	4	3.48	3	3.06	1	5.88	7	6.54	3	4.69	4	9.30	10	9.71	4	7.69	6	11.76
Moderate	3	2.61	2	2.04	1	5.88	4	3.74	2	3.13	2	4.65	6	5.83	2	3.85	4	7.84
Severe	1	0.87	1	1.02	0	0.00	2	1.87	1	1.56	1	2.33	4	3.88	1	1.92	3	5.88
Extremely severe	0	0.00	0	0.00	0	0.00	1	0.93	0	0.00	1	2.33	2	1.94	1	1.92	1	1.96
Average score (Depression)	1.96		2.29		2.47		2.66		2.44		3.00		3.17		2.83		3.51	
Absent	108	93.91	92	93.88	16	94.12	92	85.98	52	81.25	40	93.02	80	77.67	37	71.15	43	84.31
Minor	4	3.48	3	3.06	1	5.88	9	8.41	7	10.94	2	4.65	12	11.65	8	15.38	4	7.84
Moderate	2	1.74	2	2.04	0	0.00	4	3.74	3	4.69	1	2.33	6	5.83	4	7.69	2	3.92
Severe	1	0.87	1	1.02	0	0.00	1	0.93	1	1.56	0	0.00	3	2.91	2	3.85	1	1.96
Extremely severe	0	0.00	0	0.00	0	0.00	1	0.93	1	1.56	0	0.00	2	1.94	1	1.92	1	1.96
Average score (Stress)	3.68		4.38		4.24		4.82		5.14		4.35		5.45		5.83		5.06	

The average score on the “Anxiety” scale for group 1 was 2.26 points, which is less than the indicators of groups 2 (2.47 points) and 3 (2.95 points). In our opinion, this is explained by the long-term uncertainty of the military and humanitarian situation in Kharkiv and the region at the time of the study. It should be noted that the average score on the “Anxiety” scale for female students of groups 3 (3.33 points) and 2 (2.84 points) was approximately 1.29 times higher than that of male students. This manifested in them in the form of helplessness, uncertainty, helplessness, powerlessness, insecurity, loneliness, premonition of failure, inability to make a decision, etc.

The average score on the “Depression” scale for group 3 was 3.17 points, which is also significantly higher than the indicators for groups 2 (2.66 points) and 3 (1.96 points). Among the gender features on the “Depression” scale, it is possible to note that the average score of female students in the territory of Kharkiv and the region was the highest among all groups and amounted to 3.51 points. For male and female cadets of group 1, the average score on the “Depression” scale was significantly lower and practically did not differ: 2.47 and 2.29 points, respectively. This is explained, in our opinion, by the standard protected conditions of accommodation and training. Depression manifested itself in them during classes in the form of bad mood, low self-esteem, pessimism, apathy, lethargy, quick fatigue, constant dissatisfaction, abandonment and hopelessness. The average score on the “Stress” scale for students of group 3 was the highest among all respondents (5.45 points). In our opinion, this is explained by the high

psychogenic influence of the military-humanitarian situation in Kharkiv and the region that existed at the time of the study. It should be noted that the average score of groups 1, 2, and 3 on the “Stress” scale among men was significantly higher than among women, and amounted to 4.38, 4.35, and 5.83 points, respectively, which was manifested when communicating in online classes in the form of irritability, aggression, excessive optimism, drowsiness, tension and irritability.

## Discussion

Studying the mental health of student youth who continue their education in war and martial law conditions remains an insufficiently studied topic. Since for a long time European countries with a high level of development of the higher education system were not in war and martial law conditions. Kharkiv is the most student city of Ukraine, with more than 30 state institutions of higher education (universities, academies), as well as a large number of scientific institutions, colleges and private educational institutions of various types. Therefore, one of the Kharkiv universities, which provides education for both students and cadets, was chosen for the study. In addition, the choice of the research participants was determined by the fact that they all studied at the KNUA Department of Military Training. After graduation, they received a military rank and could be involved in military operations.

So, the relevance of this study was determined by the need to provide both psychological assistance to students and cadets, as well as assistance in organizing the



educational process for all stakeholders in the conditions of the war active phase.

A comprehensive study (developed questionnaire and DASS-21 tool) made it possible to identify psychogenic factors affecting cadets and students in war and martial law conditions, as well as to detail psychopathological symptoms on "Anxiety", "Depression", and "Stress" scales.

Current academic publications in psychology, medicine, pedagogy, as well as the authors' own experience allowed us to build the methodological basis of our research.

The presence of a humanitarian crisis negatively affects the mental health of the population and can lead to serious psychological and social consequences. Youth exposed to conflict face intense emotional stress that can lead to lifelong mental health and psychosocial problems (UNICEF, 2022).

In addition, it must be taken into account that in the context of the contemporary world globalization, the influence of a war-taking place in one country will inevitably lead to consequences in other countries as it affects international issues of politics, economics, population migration, healthcare, etc.

Mental health effects of war also cut across all strata of civilians. So there is an urgent need not only for cross-national research on the mental health effects of war on civilians using improved methods of study, but also for a continuous re-evaluation of the nosology of these effects (Karam & Ghosn, 2003).

Early experience of the individual affects the state of mental health. This fact should be considered. As early as World War II, the effects of war on mental health and persistent symptoms in children were studied. Among other, the earliest reaction is that to sirens and noise in general. It was found that the incident was assimilated in varying degrees according to the stage of development of the child's personality. The extraordinary toughness of the child and his flexibility in adapting to potentially threatening situations has been proven (Bodman, 1941). After the end of the World War, local wars broke out in different parts of the globe. Scientists regularly conducted research on the impact of war on people in various aspects of population migration (Mesa-Vieira et al., 2022), their mental health, etc. In their opinion, the experience of war and displacement can have profound effects on children's affective development and mental health. However the mechanisms underlying these effects remain unknown (Michalek et al., 2022).

Current research on post-traumatic stress disorder interventions for children and adolescents affected by war points to a positive experience. Improved social skills were indicated following most interventions. Nevertheless, the paucity of evidence on effective treatment options for war-affected children and adolescents was highlighted (Alzaghouli et al., 2022).

Our study correlates with the results of the research by Veronese et al. (2022) on social support, resilience and mental health in low-intensity warfare context among a sample of Palestinian university students living on the Gaza Strip. These researchers note an increase in mental

distress in the form of anxiety, depression, and acute stress.

It is known that mental health and psychosocial support programmes are some of the least expensive activities in humanitarian response. However, they can have a priceless impact on the lives of people who need them (International Federation of Red Cross and Red Crescent Societies, n. d.).

According to independent experts, Russian military aggression against Ukraine is an intended genocide (New Lines Institute for Strategy and Policy & Raoul Wallenberg Centre for Human Rights, 2022).

Therefore, researchers are confident that this war will cause significant damage to the mental health of the Ukrainian population (Shevlin et al., 2022).

It should not be forgotten that the mental health status of the Ukrainian population, in particular university students, has already been weakened by the impact of the COVID-19 pandemic (Melnyk et al., 2020).

Scientists suggest that the cumulative impact of COVID-19 and the war in Ukraine will severely compromise physical and mental health globally, affecting Ukrainians in particular (Kalaitzaki et al., 2022).

In our previous research, we studied the problem of diagnostics and prevention of mental disorders to preserve a personality's mental health (Melnyk & Stadnik, 2018); psycho-diagnostic methods "Resistance to military mental traumatization" was used to study the impact of war on the mental state of an individual (Melnyk, Prykhodko, & Stadnik, 2019). Resistance to post-traumatic stress reactions was checked using the following methods: "Mississippi Scale for Estimating Post-Traumatic Reactions", "Depression Anxiety Stress Scales", and "Insomnia Severity Index" (Melnyk & Stadnik, 2020; Melnyk, Stadnik, & Pypenko, 2020).

Many years of experience in studying the problem of preserving mental health of a personality allowed us to develop and test effective means of preserving mental health and preventing mental disorders in war and martial law conditions.

First of all, we focus on the fact that this research should be comprehensive both in the aspect of personality diagnosis and in the aspect of medical-psychological support providing. The developed model of medical-psychological support of specialists' professional activity, which is verified on military-men in war conditions (Melnyk, Prykhodko, & Stadnik, 2019), showed the effectiveness of this approach.

Traditional methods of psychological, educational, physical cultural and healthy work can also be an effective means of preserving the mental health of student youth (Melnyk, 2019). Among the effective methods of psychological assistance to student youth in war and martial law conditions, we can recommend using psychological transformation games. In particular, based on KNUIA, we used the psychological transformation game "My Dao", which proved the effectiveness of the applied technique in these conditions (Melnyk & Stadnik, 2021).



## Conclusions

Therefore, the war in Ukraine has a negative impact on the mental health of student youth. Despite the inhuman conditions of existence, especially in the territories of active hostilities (Kharkiv region), young people have a huge potential for psychological stability. Conducted studies have shown that for students of KNUIA who did not change their place of permanent residence and who are in the territory of Kharkiv and the region, the psychotraumatic impact during the war is characterized by high stress and the specific weight of vital psychogenies: risk of personal safety, lack of work or other source of income, fear death and the risk of property loss. For students of higher education institutions who are forcibly displaced persons and are outside active hostilities (on the territory of Ukraine and beyond) and cadets who are outside permanent dislocation, the following psycho-traumatic factors are relevant: risk of death of relatives, separation from family and problems of adjustment in a new place of residence. In addition, the problem of communication with friends and relatives is relevant for students and cadets who are outside permanent deployment. In our opinion, this is explained by the importance of communication using mobile and Internet connections for young people.

Further detailing of psychopathological symptoms, which was carried out with the help of the DASS-21 tool, showed that in students who are located in the territory of Kharkiv and the region, according to the "Anxiety" scale, severe and extremely severe manifestations of anxiety were 2-3 times higher than similar indicators of groups 1, 2. In our opinion, this is explained by the long-term uncertainty of the military and humanitarian situation in Kharkiv and the region during the study. Anxiety is more expressed among women of all groups than among men. The average score on the "Anxiety" scale for female students of groups 2, 3 was approximately 1.29 times higher than that of male students. This manifested in them in the form of helplessness, uncertainty, powerlessness, insecurity, loneliness, premonition of failure, impossibility to make decisions, etc.

Extremely severe manifestations of depression were not observed in cadets who are outside permanent deployment. At the same time, students of groups 2, 3, located in the territory of the Kharkiv region, in Ukraine and abroad, had such manifestations. Gender specifics of the manifestation of depression: its greatest manifestation among female students of groups 2 and 3. For male and female cadets of group 1, the average scores on the "Depression" scale were significantly lower and practically did not differ from each other. This is explained, in our opinion, by their standard protected accommodation and training conditions. Depression during classes manifested itself in them in the form of bad mood, low self-esteem, pessimism, apathy, lethargy, quick fatigue, constant dissatisfaction, abandonment and hopelessness.

Stress was more pronounced in men compared to women in all studied groups. This manifested itself when communicating in online classes in the form of

irritability, aggression, excessive optimism, drowsiness, tension and irritability. Students of group 3 had the highest levels of stress (distress) among men. In our opinion, this is due to the high psychogenic influence of the military and humanitarian situation in Kharkiv and the region.

We see the prospect of further scientific research in the development of effective psychological assistance and psychoprophylaxis measures among student youth.

## Ethical Approval

The study protocol was consistent with the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a prior approval by the Institution's Human Research Committee.

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## SOCIAL AND BEHAVIORAL SCIENCES

### Health Care Sciences





SOCIAL AND BEHAVIORAL SCIENCES. Health Care Sciences

ORIGINAL RESEARCH



# Blast Crisis in Chronic Myeloid Leukemia: An Immunophenotypic Analysis



## Authors' Contribution:

A – Study design;  
B – Data collection;  
C – Statistical analysis;  
D – Data interpretation;  
E – Manuscript preparation;  
F – Literature search;  
G – Funds collection

Singh Ak.<sup>1 ABCDEF</sup> , Singh An.<sup>1 ABCDEF</sup> , Kanaujia S.<sup>1 BCDE</sup> ,  
Kushwaha R.<sup>1 ABCDEF</sup> , Singh U. S.<sup>1 ADE</sup>

<sup>1</sup> King George's Medical University, India

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## Background and Aim of Study:

### Abstract

There are two different phases of untreated chronic myeloid leukemia – chronic phase, and blast crisis – according to the World Health Organization classification of Hematolymphoid tumors. The blast cells in the chronic myeloid leukemia blast crisis can express myeloid, lymphoid, bi-phenotypic, monocytic, megakaryocytic, and erythroid phenotypes. The immunophenotype of blast population determines how chronic myeloid leukemia – blast crisis patients respond to treatment, hence flowcytometric examination is required. The aim of the study: to assess immunophenotyping outcomes of flowcytometry performed on the chronic myeloid leukemia – blast crisis.

## Material and Methods:

A five-year retrospective descriptive analysis was carried out in Pathology Department at King George's Medical University Lucknow, India (2017-2021). The patient's peripheral blood and bone marrow aspirate samples were analyzed. Clinical, hematological, and immunophenotypic data were retrieved. The flow cytometry samples were prepared using the standardized "lyse-stain-wash" method.

## Results:

A total of 43 cases of chronic myeloid leukemia – blast crisis were retrieved from the departmental archive in 5 years. The mean age of study population was 39.62±14.86 years. There were 24 males and 19 females. 27 patients were diagnosed with myeloid blast crisis, 14 cases of B-lymphoid blast crisis and 2 cases of mixed phenotypic acute leukemia.

## Conclusions:

Identification of the blast lineage of patients with chronic myeloid leukemia – blast crisis is crucial since the existence of atypical blast phenotypes influences the disease treatment and prognosis.

## Keywords:

immunophenotyping, flowcytometry, chronic myeloid leukemia, lymphoid blast, myeloid blast, mixed phenotypic acute leukemia

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## Information about the authors:

**Singh Akanksha** (Corresponding Author) – <https://orcid.org/0000-0001-5398-6203>; [assiduous2007@gmail.com](mailto:assiduous2007@gmail.com), MD, Senior Resident, Department of Pathology, King George's Medical University, Lucknow, India.

**Singh Anurag** – <https://orcid.org/0000-0002-1979-8847>; MD, Senior Resident, Department of Pathology, King George's Medical University, Lucknow, India.

**Kanaujia Sweta** – <https://orcid.org/0000-0003-3369-1664>; MD, Resident, Department of Pathology, King George's Medical University, Lucknow, India.

**Kushwaha Rashmi** – <https://orcid.org/0000-0002-0581-2177>; MD, Professor, Department of Pathology, King George's Medical University, Lucknow, India.

**Singh Uma Shankar** – <https://orcid.org/0000-0002-9748-9484>; MD, Professor, Head of the Department of Pathology, King George's Medical University, Lucknow, India.



## Introduction

Chronic Myeloid Leukemia (CML) is a myeloproliferative neoplasm that is characterized by a balanced translocation between chromosome t (9;22) (q34; q11), leading to the formation of the Philadelphia (Ph) chromosome (Narang et al., 2016). It mainly affects older persons and seldom happens in youngsters, but can occur at any age. There is an increased number of granulocytes and their immature precursors, including occasional blast cells, seen in the peripheral blood smear. CML accounts about 20% of all adult leukemias (Pandey & Pal, 2021).

According to the latest updated fifth edition of the World Health Organization (WHO), there are two different phases of untreated CML: Chronic phase (CP), and Blast crisis (BC). Blast crisis of CML according to the WHO is defined by: 1) presence of  $\geq 20\%$  myeloid blasts in the peripheral blood or bone marrow; 2) presence of extramedullary blasts proliferation; or 3) presence of increased number of lymphoblasts in bone marrow or peripheral blood. The significance of low-level B-lymphoblasts or optimal cut-off for lymphoblasts remain unclear (Khoury et al., 2022). The blasts in the CML blast phase (CML-BP) can express myeloid, lymphoid, bi-phenotypic, monocytic, megakaryocytic, and very infrequently erythroid phenotypes (Khemka et al., 2019; Rahnemoon, 2022).

BC develops as a result of persistent BCR-ABL activation, which causes genomic instability and an accumulation of further chromosomal abnormalities. Acute leukemia symptoms could be seen in patients with blast transformation (e.g., bleeding diathesis, bone pain, night sweats, weight loss, and fatigue). Complete blood counts, an extensive metabolic panel, a bone marrow aspiration, and a biopsy should be performed all during the initial assessment of BC patients. Flow cytometry, immunohistochemistry, and cytogenetics should be requested for the latter. The immunophenotype of the blast population determines how CML-BP patients respond to treatment; hence, flowcytometric examination is required in every case of blast crisis (Hehlmann et al., 2016). Almost all CML-CP patients will develop BC in 3-5 years without treatment, although in the tyrosine kinase inhibitor (TKI) era, this dreaded transition is now extremely uncommon. Most CML-BC cases are myeloid, but up to one-third of them have the potential to become lymphoid BC. The B-cell lineage is more prevalent, and lymphoid blast crisis makes up about 30% of CML-BC. T-cell BC is a very infrequent presentation for patients (Yohannam & George, 2022).

Most individuals with CML will respond very well to TKI therapy when it is administered during the chronic phase (CML-CP), which is characterized by granulocytic proliferation. The prognosis is still bad for those who advance to the blast phase, with less than 20% of patients in the modern period surviving for five years. Response to TKI therapy is the most crucial indicator of advancement. Age, spleen size, and basophil count are other variables predicting likelihood of transformation or mortality.

Sensitive detection of aberrant haematopoietic populations is made possible by flow cytometry. Flow cytometry has been thought to be of limited use at this stage of the disease since CML-CP is characterised by proliferation of mostly granulocytes and granulocytic precursors without immunophenotypic aberrancy or maturation arrest. However, there are reports of aberrant lymphoblast populations being found when flow cytometry has been used, and there is conflicting information regarding the risk of the blast phase developing as a result. mortality (Barge et al., 2022).

The initial targeted treatments for CML were tyrosine kinase inhibitors (TKIs). The first-generation TKIs were introduced as the primary therapy in 1998, and they stopped the disease's natural development. With the accomplishment of morphological, clinical, and molecular remission targets, this has allowed patients to sustain chronic phase disease. The speed and depth of molecular remission have improved after the advent of second and third generation TKIs (Hodkinson et al., 2022).

*The aim of the study.* To assess the immunophenotyping outcomes of flowcytometry performed on CML-BP cases at a tertiary care facility in North India.

## Materials and Methods

A five-year retrospective descriptive analysis was carried out in the Pathology Department at King George's Medical University in Lucknow, North India (January 2017 – December 2021). A total of 43 cases of CML with blast crisis were retrieved from January 2017 to December 2021 and included in the final study. The cases in which flowcytometry analysis and/or BCR-ABL translocation identification were not performed, were excluded from the study. The patient's peripheral blood and bone marrow aspirate samples were analyzed. Clinical, hematological findings and immunophenotypic data were retrieved from records. For immunophenotyping of blasts, peripheral blood was used in 28 patients and bone marrow aspirate samples in 15 patients respectively. The flow cytometry samples were prepared by using the strict protocols and standardized "lyse-stain-wash" method.

For immunophenotyping of the blasts the antibody panel was comprised of CD13, cCD13, CD14, CD15, CD33, cMPO, MPO, CD64, CD14, cCD79a, CD117, CD19, CD20, CD10, CD22, cCD22, CD2, CD4, CD5, CD7, CD8, CD3, sCD3, cCD3, CD34, CD38, CD25, TdT (terminal deoxynucleotidyl transferase), and HLA-DR. In order to help with blast gating in all of the tubes, CD45PerCP was utilized as an anchor marker. 2 ml of samples (Peripheral blood or Bone marrow) were collected in Ethylene Diamine Tetraacetate (EDTA) vacutainer and analyzed using a dual laser BD FACS-Canto II, and FACS Diva software.

The single-cell basis of flow cytometry analysis makes it possible to examine multiple populations at once and detect low-level aberrant populations, particularly when a larger number of events are studied to boost sensitivity (Tembhare et al., 2020).





## Results

The flowcytometry findings of total of 43 cases of CML-BP were retrieved from records. The patient's mean age included in the study was  $39.62 \pm 14.86$  years. There were 24 males and 19 females (M:F=1.2:1) showing male predominance. 27 patients were diagnosed with myeloid blast crisis followed by 14 patients with B-lymphoid blast crisis and 2 patients with mixed phenotypic acute leukemia (MPAL). Table 1 presents an epidemiological profile of study population.

The mean age of patients in myeloid blast crisis, lymphoid blast crisis, and mixed phenotypic acute leukemia subgroups was  $41.88 \pm 14.76$ ,  $34.79 \pm 15.30$ , and  $44.00 \pm 8.49$  respectively. There was no statically significant correlation noted for age ( $p=0.331$ ) and gender ( $p=0.194$ ) distribution in different subgroups of blast crisis (Table 2).

The results of present study showed that B-lymphoid blast crisis had aberrant co-expression of CD13 and CD33 in four cases (28.57%) along with three case (12.50%) of myeloid blast crisis having aberrant expression of CD7 (Table 3).

**Table 1**

*Epidemiological Profile of Study Population*

Parameters	Age range	Patients	
		number (n)	percentage (%)
Age (n=43)	1-10 years	2	4.65
	11-20 years	3	6.98
	21-30 years	6	13.95
	31-40 years	14	32.56
	41-50 years	8	18.60
	51-60 years	7	16.28
	>60 years	3	6.98
Total		43	100.00
Gender (n=43)	Male	24	55.81
	Female	19	44.19
	Total	43	100.00

**Table 2**

*Age and Gender Distribution in Different Subgroups of Myeloid, Lymphoid and Mixed Phenotypic Acute Leukemia – Blast Crisis*

Parameters	Myeloid blast crisis (n=27)		Lymphoid blast crisis (n=14)		Mixed phenotypic blasts (n=2)		p-value
	Mean	Standard deviation	Mean	Standard deviation	Mean	Standard deviation	
Age (years)	41.88	14.76	34.79	15.30	44.00	8.49	0.331
Gender:							
Male	17	62.96	7	50.00	0	0.00	0.194
Female	10	37.04	7	50.00	2	100.00	

**Table 3**

*Immunophenotypic Profiles in Cases of CML-Blast Phase*

Parameters	Myeloid blast crisis (n=27)		Lymphoid blast crisis (B-lineage) (n=14)		Mixed phenotypic blasts (n=2)		p-value
	Positive		Positive		Positive		
	n	%	n	%	n	%	
CD13	24	92.31	4	28.57	2	100.0	<0.001*
CD33	26	100.0	6	42.86	2	100.0	<0.001*
cMPO	27	100.0	0	0.00	2	100.0	<0.001*
CD64	2	22.22	0	0.00	0	0.0	0.523
cCD79a	0	0.00	0	-	1	100.0	0.025*
CD117	16	76.19	1	10.00	1	100.0	0.002*
CD19	2	8.70	11	91.67	1	100.0	<0.001*
CD20	0	0.00	11	84.62	0	0.0	<0.001*
CD10	2	8.00	13	100.00	1	100.0	<0.001*
cCD22	0	0.00	2	100.00	1	100.0	0.821
CD5	0	0.00	0	0.00	1	100.0	0.002*
CD7	3	12.50	0	0.00	1	50.0	0.080
cCD3	0	0.00	0	0.00	1	50.0	<0.001*
CD34	26	100.00	10	76.92	2	100.0	0.031*
CD38	5	50.00	5	71.43	0	-	0.598
CD25	1	11.11	1	16.67	1	50.0	0.462
TdT	2	10.00	9	81.82	2	100.0	<0.001*
HLA-DR	24	100.00	11	100.00	1	100.0	-

Note. \*Significant ( $p < 0.05$ )



## Discussion

CML is a disease that results from the reciprocal translation of genes on chromosomes 9 and 22 (Asif et al., 2016). The fused BCR-ABL protein has altered tyrosine kinase activity (Rajkumar et al., 2016).

The prognosis for CML patients depends on the disease stage at presentation, although even for people diagnosed in CP, survival rates might vary significantly. Patients with chronic phase CML have myeloid cells at all stages of maturity (CP). Contrary to acute myeloid leukaemia (AML), the flow cytometry (FC) approach enables the detection of aberrant cell surface markers. FC is a straightforward diagnostic tool for (CP-CML) since it is used to estimate the proportions of immature cells (Blast) in the late stages of the disease. This is a disease in adults and extremely rare in childhood. This retrospective study analyzed 43 cases of chronic myeloid leukemia – blast crisis over a period of 5 years. In the present study on flowcytometric analysis, the most common blast phenotype in the blast crisis was myeloid (62.7%) followed by B-lymphoid blast crisis (32.5%) and mixed phenotypic acute leukemia (4.7%). Out of two cases, of MPAL, one case was of T-Myeloid and the other was of B-Myeloid phenotypic blast crisis. A study conducted earlier also showed similar results (Narang et al., 2016). Their study was comprised of 15 cases, which showed 14 cases of myeloid blast crisis and a single case of lymphoid (B-lineage) blast crisis. The evolution of CML into blast crisis is common in myeloid type followed by lymphoid type (Shi et al., 2015). A previous study also showed blast crises in CML are of myeloid phenotype in the majority of cases and lymphoid phenotype in 30% of cases (Bonifacio et al., 2019).

Chronic immunological dysfunction and T-cell fatigue are brought on by CML, a disease that primarily results from long-term immune cell activation in an immunosuppressive milieu.

In the present study, we found four cases of B-lymphoid blast crisis with aberrant co-expression of CD13 and CD33 along with one case of myeloid blast crisis with aberrant expression of CD7. Another study conducted by Hegde et al. (2020) on chronic myeloid leukemia showed two cases displaying mixed phenotypic features comprising each one of myeloid and megakaryocytic differentiation. The treatment of CML-BP patients depends on the immunophenotype of the blast population hence it is mandatory to do flowcytometric analysis in each and every case of blast crisis (Assi & Short, 2020; Wang et al., 2021). Atypical lymphoblast populations in CML are listed as a potential sign of an aggressive disease course in the WHO classification of myeloid neoplasms (Arber et al., 2016; Chen et al., 2020). There are some study limitations, including the fact that it was conducted at just one hospital and there was no patient follow-up. Newly diagnosed cases of CML-BC are treated with first-generation TKIs, according to European Leukemia Net (ELN) 2018 data (imatinib, nilotinib, dasatinib and bosutinib). Third or fourth generation TKIs should be used to treat patients who do not react to first generation TKIs. For patients with the BCR-ABL coding domain T315I mutation, ponatinib is the TKI of

preference. Additionally, polychemotherapy is advised for these patients. Patients who have had TKI treatment before and go on to develop AP or BC are regarded as receiving TKI treatment that has not previously been given. Allogenic stem cell transplantation is the best treatment choice for CML-CP patients who have grown resistant to at least two TKIs (Hegde et al., 2020).

After a BC diagnosis, the average survival time is thought to be 2-4 months. There are noticeable differences in the proliferation, differentiation, adhesion, and apoptosis of malignant cells during the blast crisis compared to those during the chronic phase, which is well recognised. New, non-random molecular or genetic alterations are thought to be the cause of the blast transformation. Trisomy 8, trisomy 19, isochromosome 17, and mutations in the p53, RB, or RAS pathways are the reported most frequent genetic anomalies. In myeloid BC, inactivating mutations of the genes p53 and RUNX1 are present, whereas inactivating mutations of the genes CDKN2A/B have been found in lymphoid blast crisis. Response rates to normal induction therapy are less than 20–30% for CML-BC with an unique blast phenotype. Similar to other cases of CML with BC, patients with the erythroid or megakaryocytic blast phenotype get the same care. Cases with lymphoblastic differentiation, on the other hand, are managed as acute lymphoblastic leukaemia (Hegde et al., 2020).

It is suggested that molecular or genetic changes, such as trisomy 8, trisomy 19, isochromosome 17, t(3;21), mutations in p53, RB gene, RAS pathway, or p16/ARF pathway, are responsible for the blast transformation of CML. T-cell acute lymphoblastic leukaemia (T-ALL) and BCR-ABL1-positive bilineage leukaemia might be difficult to distinguish from CML blast crisis of T-cell lineage. De novo BCR-ABL1-positive T-cell ALL has several characteristics, such as bone marrow involvement, small BCR breakpoint mutations, TCR gene rearrangement mutations, children or teenage age group, and no prior history of CML. Clonal T-cell gene rearrangement (TCR) is not usually present in early immature T-cell neoplasms (like T-ALL), therefore its absence does not always rule out a T-cell blast catastrophe. A diagnosis of CML in a T-cell blast crisis would be supported by BCR-ABL1 positive in both myeloid and lymphoid cells, as opposed to just the lymphoid component as it was found in our case.

5–10% of CML patients eventually progress to advanced phase while on therapy, despite the ground-breaking results TKI in CP-CML achieved. Most of the processes underlying TKI failure, the development of illness, and cytogenetic changes are yet unclear. TKI failure is caused by BCR-ABL1 dependent mechanisms, including mutations in the ABL1 kinase domain, amplification of the BCR-ABL1 oncogene, and high levels of BCR-ABL1 mRNA expression. When the anaplastic threshold is achieved and additional oncogenes eventually cause progression in a BCR-ABL1-independent manner, unchecked BCR-ABL1 signalling causes genomic instability and a more chaotic state. The increased aggressive behaviour of CML clones expressing high amounts of BCR-ABL1 can be explained by both



quantitative and qualitative factors (Bonifacio et al., 2019).

Acute biphenotypic leukaemia (ABL) is uncommon and predominantly affects children. ABL has no predetermined diagnostic standards (Ivanov et al., 2020). The BCR-ABL1 inhibitor has no effect on the various leukaemia cells (mainly cells of the granular chain) in CP-CML, whereas TKIs are mostly focused at the progenitor cell group. It is very predictive to use CD34 expression. The expression of CD34 might fluctuate from time to time, and this variation may be caused by the sensitivity of the monoclonal antibodies used, as well as by technical considerations (such as the sensitivity of the flow cytometry method) and the standards used to obtain a positive result.

CML blast crisis (CML-BC), despite recent advancements in the treatment of early-stage illness, continues to provide a therapeutic challenge. Less than 30% of patients with CML-BC respond to normal induction chemotherapy, making it highly resistant to the condition. When compared to de novo acute leukaemia, conventional chemotherapy has been substantially less effective in treating this illness, with non-responders having a mean survival time of only 2 to 4 months following diagnosis of blast crisis. In CML-BC, numerous chemotherapy regimens have been explored, with varying degrees of effectiveness. Although imatinib was studied in individuals with CML-BC, the majority of CML-BC instances currently occur in patients who are already receiving imatinib-based therapy and going through the blastic phase as a result. As a result, there is no established standard of care for CML-BC patients. The future course of new treatment modalities will be decided by further research into the molecular transformation processes of chronic-phase CML-BC and strategies to address these molecular abnormalities. Despite significant efforts, the prognosis for CML in the blast catastrophe remains depressing. Currently, extending the chronic phase and postponing the start of the blast crisis is the most effective way to increase survival in CML (Esfahani et al., 2006).

A TKI treatment was recommended before allogeneic SCT for all patients in advanced phase in earlier ELN treatment guidelines. Especially for AP patients, most recent guidelines recognised the value of frontline TKI treatment without the necessity for a future transplant. Both ELN and NCCN advise treating newly diagnosed AP patients with TKI alone; transplantation is only considered as a last resort for those who do not respond to treatment as expected. Only imatinib 600 mg daily has a market authorisation in the European Union for frontline use in newly diagnosed patients in advanced phase, although this drug's efficacy is constrained by the emergence of BCR-ABL1 kinase domain mutations, which are more common in this situation than in CP. Both retrospective and prospective trials have shown the high efficacy of frontline treatment with nilotinib or dasatinib, as well as the impressive DMR rates. Intriguingly, in the randomised prospective studies on CP patients, the amount of benefit from 2nd generation TKIs over imatinib was more pronounced in high-risk patients,

underscoring the limitations of imatinib in treating a more aggressive disease.

Numerous initial variables at the time of CML diagnosis have been linked to various probabilities of progression. Current prognostic models identify high-risk patients who are more likely to develop AP-CML or BP-CML. The EUTOS long-term survival (ELTS) score, in instance, indicates three risk categories with significantly varying risks of death from progression in advanced phase.

The kinetics of response to treatment is the most important indicator of progression. Numerous studies have shown that failure to diminish BCR-ABL1 by 10% after three months is associated with a higher risk of progression to the advanced phase and worse survival when using frontline imatinib and 2nd generation TKIs. During the first several months of treatment, measuring the BCR-ABL1 transcript halving time may help to improve the sensitivity and specificity of response measurement.

Finally, patients who receive consistent, standardised monitoring are at a decreased risk of progression than those who receive less frequent monitoring. Despite proper monitoring and an apparent satisfactory response to TKI, abrupt onset of BP may occasionally happen. We believe that all newly diagnosed CPCML patients should preferably receive frontline treatment based on the ELTS scoring system, and non-low-risk patients should be given consideration for 2nd generation TKIs or closely monitored for an early molecular response when imatinib is chosen as the treatment of choice (Bonifacio et al., 2019).

### Conclusions

Identification of the blast lineage of patients with CML – blast crisis is crucial since the existence of atypical blast phenotypes influences the treatment strategy. Flow cytometry with an extended panel of antibodies is utilized to assist in blast lineage determination and detection of aberrant antigen expression in CML – blast crisis.

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### Ethical Approval

This study had been approved by the Institutional Ethics Committee, King George's Medical University, Lucknow, India (No. 461/Ethics/2022 from 06.06.2022).

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**SOCIAL AND  
BEHAVIORAL SCIENCES**

**Rehabilitation**



## SOCIAL AND BEHAVIORAL SCIENCES. Rehabilitation

### ORIGINAL RESEARCH



# Significance of Palliative Care for the Quality of Life for Oncology Patients



#### Authors' Contribution:

- A – Study design;
- B – Data collection;
- C – Statistical analysis;
- D – Data interpretation;
- E – Manuscript preparation;
- F – Literature search;
- G – Funds collection

Nikolov A.<sup>1</sup> ABCDEFG , Georgieva L.<sup>2</sup> DEFG

<sup>1</sup> Dental Clinic "Zahnzentrum Rudow", Germany

<sup>2</sup> Medical University – Sofia, Bulgaria

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#### Background and Aim of Study:

#### Abstract

Oncological diseases are one of the biggest problems that can cause irreparable harm to human health. The significance of various types' medical care on the quality of life for patients with malignant diseases remains an urgent research problem.

The aim of the study: to provide empirical data for the significance of palliative care in supporting the quality of life for patients with gastric cancer.

#### Material and Methods:

The study was conducted at the University Hospital of Heidelberg, Germany. A representative sample of the study subjects consisted of 378 patients diagnosed with gastric cancer. Comparative analyzes to approaches in cancer prevention, as well as 5-year survival among patients with gastric cancer in Germany, Bulgaria, Japan, and Singapore were used.

#### Results:

The majority of the patients in the study sample from Germany died in their homes or in hospices (91.2%), while only a small proportion died in the hospital (8.7%). Based on the international comparison, we concluded that in Bulgaria, the ongoing treatment and care of terminally ill patients differ significantly in terms of their scope, development level and impact on the patients. The 5-year survival rate for stomach cancer in Bulgaria is 3%, which is much lower than in Asian countries, where there is a significantly higher survival rate for this disease: Singapore 10-30%, Japan 12-35%.

#### Conclusions:

The significance of the palliative care to support the quality of life for oncological patients has been constantly increasing in recent years. Systemic and long-term palliative care provides the necessary support for quality of life and can affect the 5-year survival of oncological patients. This is confirmed by our study in Germany, where rates are 28-30%. The authors recommend providing professional, high-quality palliative care as needed to ensure quality of life for patients with malignant diseases.

#### Keywords:

palliative care, life quality, 5-year survival, patients, stomach cancer, mortality from gastric cancer

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#### Information about the authors:

**Nikolov Alexander** (Corresponding Author) – <https://orcid.org/0000-0001-5414-9378>; [alexander\\_nikolov1988@yahoo.de](mailto:alexander_nikolov1988@yahoo.de); PhD student, Dental Clinic "Zahnzentrum Rudow", Berlin, Germany.

**Georgieva Lidia** – <https://orcid.org/0000-0002-9320-9203>; Doctor of Medical Sciences, MD, Professor, Medical University – Sofia, Sofia, Bulgaria.





## Introduction

Malignant diseases are one of the biggest problems of our time. In recent years, the frequency of their occurrence has increased significantly worldwide.

Stomach cancer is the fifth most common cancer in the world and the third most common cause of death due to cancer. The importance of palliative care for the duration and quality of life of gastric cancer patients is constantly increasing (Smyth et al., 2020).

Although the quality of their prevention and treatment have improved, the morbidity and mortality from gastric carcinoma in both sexes continues to raise with the increase in the life expectancy of the population. (Ilic & Ilic, 2022),

Gastric carcinoma cases burden modern society, with both the severity of their course and their high financial cost for the social system. This fact obliges us to continue to study the essential reasons for this and to try to actively counteract them, not only through primary and secondary prevention, but also through the prevention of the mental and social impacts of the disease (Hanauske, 1997).

Stomach cancer is the fifth most common cancer in the world. It is the third leading cause of death from cancer (after lung cancer and liver cancer), with, according to statistics from 2020, 750,000 deaths worldwide. It occurs twice as often in men than in women and occurs in more than half of cases in patients over 75 years of age (Lordick et al., 2011).

Most of the cases of this carcinoma are caused by factors such as lifestyle, including poor diet, smoking, obesity, alcohol use and infection with *Helicobacter pylori* bacteria (Deliyski, 2000).

Stomach cancer changes the lives of patients and of their relatives. The disease and its treatment can burden the patient not only physically, but also mentally (Ajani et al., 2010). Consequences of the disease include family problems, financial worries, professional and social burdens, early retirement. When stomach cancer is in an advanced stage, it most often cannot be removed and the treatment of cancer patients is palliative. Palliative care aims to alleviate the mental and physical suffering of the patients and are of great importance for the duration and quality of life of the patients (Harada et al., 2020).

The word "hospice" comes from the Latin "hospitium" and means guests of monasteries. The first hospices date back to the Middle Ages, when members of religious orders housed dying people, where they cared for them until they died. The actual concept of modern hospice care was built by two medical persons in the 1970s in Great Britain – Cecily Saunders and Elizabeth Kübler-Ross, who developed hospices with the effective treatment of pain as their main goal. Even at this early stage of development of care for dying patients, there is a developed sensitivity for preserving a dignified life, which is also related to the treatment of pain and other symptoms having a direct impact on the patient's quality of life in his last days. The first palliative care unit was built in 1975 at the Royal Victoria Hospital in Montreal, Canada.

Currently, there are departments of palliative medicine in over 50 countries around the world, including the USA, Germany, France and the Republic of Bulgaria. In some countries such as New Zealand, Sweden, Norway, Canada, Australia and Great Britain, there are even university departments of palliative medicine and specialization of palliative medicine doctors (Deliyski, 2000). It is interesting to note that in Great Britain there is an overall very well-developed teaching program in this medicine for all professional groups involved in palliative care. The integration of palliative medicine is so advanced in UK healthcare that more than 50% of patients who die from gastric cancer are cared for by specialist palliative care teams (Adolph et al., 2014).

In 2020, there are 51 registered palliative and hospice beds per 1 million inhabitants in the UK, 200-day hospices and 370 home care teams complement the palliative care system. In the United Kingdom, only a short time after the foundation of the hospice "St. Christopher" in 1975, the idea of hospice became a phenomenon, leading to numerous hospices being founded in the 1970s. Unlike the well-organized system in Great Britain, in other Western European countries, separate palliative wards and hospices were established for the first time in the 1980s, and a health system covering palliative medicine was established at first in 1990s.

It is difficult to give exact statistics for the different European countries. In general, it should be noted that especially in the years from 1990 to 2015, a significant number of palliative and hospice facilities were registered. In Sweden, the number of inpatient units increased from 2 to 22, and in 1994, and in Poland from 16 (1992) to 83 (1993). In France, their number increased from 6 (1992) to 30 (1994). Norway started very early with palliative medicine and the training and specialization of medical staff in this field was strengthened from the beginning on. Another important aspect in Norwegian healthcare is the introduction of the so-called "Supportteam" to support palliative cancer patients. From 1984 to 1996, the number of these hospital/home teams increased to 210. The first title of "professor" in the field of palliative medicine took place in Norway in 1994, and a year later, the first department for palliative care was established. In 1989, the European Association for Palliative Care (EAPC) was established and in 2004, it had already more than 50,000 collective members.

The World Health Organization (WHO) describes palliative medicine as treatment for patients with incurable, progressive and advanced disease with a limited life expectancy, for whom the main goal is to improve the quality of life. This definition limits palliative treatment options not only for malignant diseases (in this case stomach cancer), but also excludes many patients with chronic diseases and disabilities. Although alleviating pain is the task of all physicians, regardless of the type of disease and how advanced it is, palliative care clearly aims to mitigate suffering at the end stage, when the focus of treatment is entirely on





increasing and improving the quality of life, not the life extension. Focusing on pain control and symptom relief become the primary goal of therapy (Cunningham & Schulick, 2007).

Another very essential element of palliative medicine for patients with stomach cancer is communication with the seriously ill or dying patient and his relatives. Honesty in communication, delivering bad news, and grief support are examples of this. Thirdly, the ability of the patient to lead as normal life as possible, such as carrying out old habits that give him/her pleasure and maintaining contact with relatives, should be noted. Although palliative care, as defined above, is not limited to the treatment of patients with incurable gastric cancer, it should be noted that traditionally palliative care is established in the field of tumor diseases. Palliative care does not exclude chemotherapy, radiation therapy and/or surgical therapy. A condition for the implementation of these therapies is, however, that the benefits of these measures are greater than their potential adverse impact for patients (Kelsen & Atiq, 1993; Scarpi et al., 2019).

In summary, palliative medicine is characterized by the following points (Koizumi et al., 1999):

1. Comprehensive control of the patient's pain and symptoms.
2. Integrating the physical, social and spiritual needs of patients, relatives and the treating team, both during and after illness and death.
3. Accepting death as a part of life. When life ends, death should neither be hastened nor delayed. Palliative medicine rejects euthanasia.
4. Competence on the important issues of communication and ethics.

The task and aim of palliative medicine are to provide support to the patient suffering from stomach cancer so that he has the best possible quality of life until his end. This is possible thanks to the cooperation of capable palliative bases with family doctors, social care and hospital departments, as their main goal is to ensure optimal round-the-clock treatment of palliative ill patients. (Kilpatrick & Johnson, 1999; Kitzes & Anderson, 2003).

*The aim of the study.* To provide empirical data for the significance of palliative care for patients with gastric cancer. In particular, we focus on the analyses of the role of palliative care for improvement of the duration and quality of life of stomach cancer patients and discussed potential mitigation of the negative mental and social impacts of the disease.

## Materials and Methods

To address the research question, we used various empirical data as well as literature review.

Firstly, we performed descriptive statistics of data from an own study conducted with a total sample of 378 gastric cancer patients at the University clinic in Heidelberg in order to analyze place of death and potentially palliative care of stomach cancer patients.

Secondly, we compared prevention approaches as well as hospice and palliative care in eastern European

countries with Bulgaria as an example, western European countries with Germany as an example as well as more advanced world Asia countries, in particular Singapore and Japan.

Lastly, we analyzed available statistics about incidence, prevention, 5-year survival of stomach cancer in the selected countries.

## Results and Discussion

Table 1 presents the results about place of where the death of patients occurred. The data is collected in an own study conducted with gastric cancer patients. The results show that 345 deaths (91.2%) did not occur at the hospital. In other words, the majority of the patients died in their homes or in hospices.

**Table 1**  
*Place of Death of Patients with Stomach Cancer*

Parameters	Patients	
	people	%
Death occurred at home or in a hospice	345	91.2
Death occurred in the hospital	33	8.7
Total	378	100.0

Although the terms hospice care and palliative care are often used interchangeably, the main difference between the two should be noted. While palliative care has a broader scope, including patients with various diseases and needing long-term specialized and active general care for their physical, psychosocial and spiritual condition, hospice care is focused on patients in the terminal phase of their illness. It can be summarized that hospice care is part of palliative care with the important clarification that it includes the preparation of the patient and his family on topics related to the end of life and implies even more intensive care for the physical, psycho-social and mental condition of the patient in the last months of his/her life. This clarification also constructs one of the important moral questions faced by specialists caring for patients in a terminal stage, namely – is it necessary for the patient to know about the approaching death (Kern et al., 2007; Klaschik, 2009). According to the Law on Medical Institutions of the Republic of Bulgaria, a hospice is a medical institution “in which medical and other specialists carry out long-term medical monitoring, supporting treatment prescribed by a doctor for a person with chronic debilitating diseases and medico-social problems” (Methodist Le Bonheur Healthcare, n. d.). In contrast, in countries with better-developed services for terminally ill patients (USA, England, Austria, Germany, etc.), this definition focus on the concept of “hospice care”, which is aimed precisely at the nature of the care itself rather than the physical location where it is provided. This can be the patient's home or a specialist facility – the right to decide is in their hands and/or in the hands of the family when the patient is unable to decide for himself.



Differences in the handling of the concept itself could be considered as an indicator of the degree of development (or stagnation) of these concerns in the respective country, as they reveal the way in which a given phenomenon is thought of in a society (Arvanitis et al., 1990; Klaschik, 2009).

Comparing the different prevention approaches in Bulgaria and in the countries of Western Europe, we could conclude that in Bulgaria the ongoing treatment and care of the terminally ill differ significantly in terms of the scope of the patients, rates of development and effect on the patients.

The five-year survival rate in patients operated on for Ca ventricles shows significant differences according to the stage of the disease and is relatively low. The following

survival rates are typical for Japan (a country with a high mortality rate from stomach cancer): for advanced stages (IIIB and IV) it is between 5-17%, for potentially curable stages (IV-II-IIIa) it is between 18-35%, for early gastric cancer it is between 78-95%, with Japanese authors traditionally reporting higher survival for all stages (Krastev, 1980).

Table 2 shows that in countries like Japan, where 20 years ago the incidence per 100,000 people was 77 only with changes in diet, lifestyle, and environment, it has dropped to 42 per 100,000. This high survival rate in Japan is also due to the good palliative care (Japanese Gastric Cancer Association, 2021; Kato & Asaka, 2012).

**Table 2**

*Incidence, Prevention; 5-Year Survival of Stomach Cancer in Selected Countries*

Country	Incidence (per 100,000 people)	Preventive measures	Screening	5-year survival, %
Germany	13	Yes	Yes, active	28-30
Bulgaria	14	No	No	3
Singapore	37-39.2	Yes	Yes, active	10-30*
Japan	42	Yes	Yes, active	12-35*

Note. \*1<sup>st</sup> - stage up to 90%.

The 5-year survival rate from stomach cancer in Bulgaria is much lower than countries in Asia, where a significantly higher incidence per 100,000 population is observed. The reasons for this are complex. One of the suspected reasons may be insufficient provision and access to quality post-operative, long-term care and palliative care. Another reason could be the difficult access to the main method of detecting and proving gastric carcinoma, such as fibrogastroscopy and video-assisted fibrogastroscopy with biopsy. These highly specialized studies require precise, expensive equipment, which is still extremely insufficient in Bulgaria. In addition, this equipment requires highly specialized personnel with many years of experience, which currently only large oncology centers have.

This difficult access of the population to such specialists greatly complicates early detection, which subsequently determines the low 5-year survival rate. Just the opposite conclusion is necessary for countries like Japan and Singapore, which, despite their high morbidity per 100,000 people, are the undisputed champions in early detection, rapid complex treatment, good palliative care and many times higher 5-year survival rate (Methodist Le Bonheur Healthcare, n. d.).

## Conclusions

The significance of the palliative care for the quality of life with a diagnoses cancer of the stomach constantly increases during the past decades. It is possible that the good long-term palliative care can influence the 5-year survival rate of the cancer patients. Therefore, additional studies on this direction are necessary. By then, provision of an increasing, according to the needs, amount of good quality palliative care is recommended.

## Ethical Approval

The study protocol was consistent with the ethical guidelines of the 1975 Declaration of Helsinki as reflected in a prior approval by the Institution's Human Research Committee.

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## LETTER TO THE EDITOR





## LETTERS TO THE EDITOR

### LETTER TO THE EDITOR



## The Development of Resilience of Schoolchildren as a Basis for Health Care in the Conditions of Martial Law



Kostina V. V.<sup>1,2</sup> , Pypenko I. S.<sup>2,3</sup>

<sup>1</sup> H. S. Skovoroda Kharkiv National Pedagogical University, Ukraine

<sup>2</sup> Scientific Research Institute KRPOCH, Ukraine

<sup>3</sup> Educational Center KRPOCH, Ukraine

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**Information about the authors:** **Kostina Valentyna Viktorivna** (Corresponding Author) – <https://orcid.org/0000-0003-2410-7497>; [Vkostina2014@gmail.com](mailto:Vkostina2014@gmail.com); Doctor of Pedagogical Sciences, Professor, Professor of Department of Social Work and Social Pedagogy; H. S. Skovoroda Kharkiv National Pedagogical University; Scientific Research Institute KRPOCH, Ukraine.

**Pypenko Iryna Sergiivna** – <https://orcid.org/0000-0001-5083-540X>; Doctor of Philosophy in Economics, Associate Professor, Scientific Research Institute KRPOCH; Director, Educational Center KRPOCH, Ukraine.

### Dear Editor,

The problem of preserving and strengthening the health of schoolchildren became acute this year for all specialists in the field of education in connection with serious difficulties of an objective nature, which are associated with work in the conditions of a full-scale military invasion from Russia, when on the competence of specialists in the formation of resilience in children and youth depends not only the success of educational activities in particular, but also the preservation of the nation's gene pool in general.

Researchers note that for the development of resilience in an individual, it must experience adversity or threats during its own development, as there must be a past or current danger for its formation (Olsson et al., 2003), as well as the interaction between risk factors, protective factors and vulnerability factors that lead to the successful acquisition of a certain ability to recover (resilience), or maladjustment (Pakhnenko, 2022). Social capital (social resources, community effectiveness), economic development (opportunities for economic

support), human capital (knowledge, leadership) and physical community resources are among the components of ensuring community resilience.

According to Kireieva (2022, p. 6), a person's presence in situations of high level of uncertainty and, at the same time, low level of awareness and controllability prompts them to engage a wide range of adaptive capabilities, among which such personal characteristics as resilience (ability to regenerate) and optimism (positive confidence in expectations) are important, which are resources for effective adaptation to difficult/atypical life situations. It was established (Kireieva, 2022) that with age, the formation of resilience and optimism in difficult conditions requires the involvement of a greater number of predictors (reflection of past living experience and overcoming difficult life situations, awareness of new circumstances and one's state of health and transformation of behavior patterns in the difficult conditions of the present, presence of positive expectations in the future).



Formation of a children's health culture, starting from the first days of their schooling, can play an important positive role in this. This will help develop their resilience in the future (Melnyk, 2002). Characteristics important for the development of resilience include the following: stable acceptance of reality, deep, supported by strong values faith in the meaning of life, ability to improvise (Coutu, 2002); social features (developing friendships, the ability to establish positive relationships with others, possessing effective communication skills that require the appropriate use of language and finding help), emotional features (a strong sense of self-efficacy, high self-confidence, high self-esteem and self-acceptance, emotional control and awareness skills, quick ability to adapt to new situations, ability to resist anxiety and obstacles), cognitive/academic features (high achievement motivation, ability to consider and plan for the future and deal rationally with stressful and traumatic events, ability to create many more internal attributes, than external attribution) (Karatas & Cakar, 2011).

Resilience is considered (Hrishyn, 2021) as a quality of the personality that determines the possibility of resisting stress and successful adaptation afterwards due to the development of adaptation to changing life circumstances, stress resistance, psychological well-being, success in leading activities, and among the factors of resilience are determined: regulatory (ability to self-regulate, vitality, self-control, motivation for success, active coping); cognitive (optimistic attributive style, cognitive flexibility, meaningfulness of life, its focus on achieving a certain goal, developed spiritual intelligence); emotional (predominance of positive emotions, good mood, ability to regulate emotions) and socio-behavioral (effective holding in childhood, good upbringing, good relationships with adults in childhood, presence of partners and friends, presence of social support and the ability to seek support from others).

Sychynska (2022, p. 72) proves that parental support is a significant external resource that contributes to the positive development of personality in adolescence and, integrating with the psychophysiological qualities of adolescents, becomes a platform for the formation of their resilience.

Furthermore, researchers (Melnyk et al., 2022) define the development of physical and social activity as an important factor in the development of the adaptive capabilities of young people when overcoming complex social challenges today.

Researchers from the Harvard School of Public Health (Betancourt & Khan, 2008 ) claim that a number of protective processes contribute to sustainable mental health outcomes in children, if viewed through the lens of the child's social ecology. Restoring the disrupted social ecology is fundamental to improving preventive and rehabilitative measures for war-affected children. The researchers see the restoration of the opportunity to learn and develop vocational skills as a condition for the development of hope and tools for future success in life and emphasize that in situations of displacement for children and youth during wartime, educational programs can perform a protective function, since children are then

under more centralized supervision and there is an opportunity to create systematic mechanisms to check their mental and physical health, as well as to promote social connections between children, professionals and other adults in the community by involving beneficiaries in collective action on behalf of children. Scientists also prove that in relation to the support of children affected by war, there is evidence of the positive impact of emotionally warm relationships between children and the staff of children's institutions, which provide them with assistance for the development of resilience and mental health and protection against psychotraumatic disorders in later life.

Frounfelker et al. (2019) also emphasize the need to provide children affected by armed conflicts with basic needs, a psychologically favorable environment, opportunities for education and professional training, and other resources that contribute to their positive psychosocial development and mental health, and emphasize the importance of family involvement in the child's healing process.

As the researchers (Kravtsova & Kravtsov, 2022) note, in the conditions of war in Ukraine, the issues of preserving the life of a specific person and the vital activities of the community come to the fore, which involve the preservation of physical and mental integrity, health and social welfare of the victims, as well as communities - in the occupied territories, in the areas of hostilities and in the regions that accommodate displaced people, when the need to develop a comprehensive approach to maintaining, preserving and restoring the mental health of various strata of the population in the war and post-war period becomes urgent, when an effective system of medical and social rehabilitation, maximum socialization of the affected persons, creation of full-fledged communications, legal support, restoration and continuous improvement of the safety and comfort of the environment as a factor of physical and psychological safety should be established. The researchers single out the following health care priorities aimed at ensuring the stability and sustainability of the development of the territorial community: formation of a public space on the territory that is safe and comfortable for living; social adaptation and reintegration of combatants and internally displaced persons, especially children; psychological assistance to community members and internally displaced persons; support, full-fledged development and patriotic upbringing of children and youth.

During the introduction of martial law in Ukraine, educational and methodological support for the education process useful for the development of student youth resilience was worked out (Kornienko et al., 2022) – developed by researchers of the extracurricular education laboratory of the Institute of Educational Problems of the National Academy of Sciences of Ukraine, an end-to-end curriculum with after-school education of the health direction “Fundamentals of life safety in combat conditions” (ensures the training of schoolchildren in the rules of preserving health and life in combat conditions by familiarizing them with the rules of behavior in the combat zone, teaching how to treat wounds and make



bandages and provide first medical aid for burns, overheating, frostbite, as well as familiarization with the simplest tests for detecting signs of life, which can be implemented in classes of all areas of extracurricular education).

According to the content of the informational and analytical collection "Education in Ukraine under martial law", the main current priority of educational institutions is to ensure the psychological stability of participants in the educational process who suffered from Russian armed aggression (Shkarlet, 2022). According to the research of the Institute of Educational Analytics, with the beginning of the aggression of the Russian Federation against Ukraine, the number of appeals to the psychological service of educational institutions regarding the psychological support of children in war conditions, the provision of psychological assistance, including emergency, overcoming stress, experiencing loss, grief, sadness and suffering, psychotherapeutic work with children who lost their parents, home, health and suffered injuries, survived the bombing, became refugees, IDPs - 446,368 appeals (Shkarlet, 2022): 54.5% appeals from children, 24.2% appeals from parents or legal representatives, 2.5% appeals from other family members, 17.2% appeals from teaching staff, 1.6% appeals from groups with limited mobility. Prevention of suicidal manifestations and inclinations among children is also an important area of activity of the psychological service – 49,777 appeals: 33.2% appeals from parents, 18.8% appeals from pedagogical workers, 31.1% appeals from schoolchildren and 16.9% appeals from other interested persons and public organizations.

Useful developments in this direction are the use of information space to create resilient environments and applications that create circles of support for subjects of the educational process (Shkarlet, 2022): educational chatbot of the Ministry of Education and Culture EducationUaBot (section "Psychological support" with provision resources and information for parents); Telegram channel "Support the child" (with placement of psychological advice and materials on psychological trauma, games, exercises, toys, audio and video materials for pedagogical workers and parents); professional development course for pedagogues "First psychological aid to participants in the educational process during and after the end of hostilities" (10 multimedia lessons in the international SCORM format, additional materials and practical trainings, during which educators learn about psychological conditions, learn to provide psychological first aid using methodological manuals of Save the Children, and also receive recommendations on the redirection of the International Standing Committee); psychological support project "PORUCH" from the Ukrainian Institute of Cognitive-Behavioral Therapy and the All-Ukrainian Community Center "Volunteer"; Telegram channel "Take care of yourself" (a number of materials on psychological support for adults in general and on the occurrence and impact of aggression on the human condition during war, recommendations on stabilization of emotional state and stress management in particular); on the website of the DNU "Institute for the

Modernization of the Content of Education" a page "Materials for use in work during military operations" has been created (information on the best practices of psychological and pedagogical support and support of participants in the educational process in conditions of military operations and armed conflicts, methodological recommendations "Psychological First Aid. Algorithm of actions").

Pedagogical workers and psychologists of educational institutions are important subjects in the formation of children's and youth's resilience.

This imposes a great responsibility on these professionals, who need to maximize their innovative potential and pedagogical competencies (Melnik & Pypenko, 2017) in these extreme conditions.

With the support of foreign and domestic social institutions, a number of initiatives are being implemented in Ukraine for the training of pedagogical workers and psychologists with the aim of forming professional competencies to provide psychological support for children during education and providing psycho-social support (Shkarlet, 2022): conducting training and supervision of psychologists with the help of a short group intervention called "Teaching the recovery method" based on cognitive-behavioral therapy (Children and War Foundation); training of trainers from institutes of postgraduate pedagogical education according to the training programs: "Cultivating resilience skills for teachers", "Cultivating resilience skills for students", "Basics of psychological counseling regarding common difficulties that arise in the field of mental health in children" (Center of Health and Self Development "Family Circle"); on the adaptation and exchange of educational resources on the basics of mental health "Cycle of well-being" for teachers, parents and children (National Center for Improvement of Scotland); adaptation of four online courses on social-emotional learning, work with psychological trauma and stress for pedagogical workers (PSS/SEL) (Childhood Education International); adaptation and implementation of Child/Adolescent Mental Health Support in Education protocols and the ReachNow tool (CCDT tool) that can be used by people without specific mental health expertise to help them identify and refer children with mental health needs (War Child); regarding the implementation of the "Return to Learning" program for teaching staff, Tree App – an application for mental health support for children with built-in socio-emotional learning (Save the Children); regarding the holding of webinars for pedagogical workers (for educators and heads of preschool education institutions, specialists of inclusive resource centers) on psychological support for children (NGO "Support the child").

The analysis of the activity of youth organizations during the martial law testified that the All-Ukrainian Youth Center carried out significant work and prepared Recommendations on the organization of space and activities of youth institutions during wartime. The recommendations provide advice, depending on the location of the youth center, on the protection of visitors to the center, the protection of the informational space



around it, what youth centers should do in the temporarily occupied territory and its activity in order to preserve and strengthen the resilience potential of its members, as well as provide examples of the activities of those successfully operating under martial law youth centers (The All-Ukrainian Youth Center, 2022).

Taking into account the results of the analysis of scientific research and practical experience on the problem of the development of resilience in children and youth, we selected important factors for the design and development of a resilient educational support space (creating a socially favorable supportive environment, involving in the process socio-pedagogical specialists, volunteers and parents of pupils, creating conditions for children and young people to develop a sense of togetherness and confidence in their own strengths, opportunities and future prospects, the formation of self-awareness and self-acceptance skills, the ability to resist anxiety and plan their own actions, the use of art therapy resources and artistic theatricalization) and its approbation was carried out during organization of social and educational influences with children and student youth in educational institutions under martial law (Kostina, 2022). The obtained results proved the effectiveness of the developed social and educational tools and the possibility of their use in the process of professional training of future specialists in the social field to work in conditions of martial law.

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**CONTACT INFORMATION**

Scientific Research Institute KRPOCH  
Kharkiv Regional Public Organization  
“Culture of Health”,  
Zabaikalskyi lane, 6, of. 6,  
Kharkiv, Ukraine, 61105  
Tel.: +38 066 239 77 75  
Email: [ijsa.office@gmail.com](mailto:ijsa.office@gmail.com)  
URL: <http://ijsa.culturehealth.org>

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