NEC Nursing Evidence and Care
Integrating Science, Education & Caring Practice
INTERNATIONAL JOURNAL

NEC 2025; 1(1): 67 - 77

Original scientific article

Different Faces of Preoperative Fear: Insights from Cardiac Surgery Patients

Preoperative Fear in Patients Undergoing Cardiac Surgery

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Keywords: anxiety; CRO-SFQ; cardiac surgery patients; surgical procedure; preoperative fear.

Received September 2, 2025; Accepted October 6, 2025

DOI:10.XXXXX/necos.v1.i1.aX (pending)

Abstract

Introduction: Surgical fear refers to the emotional response experienced by patients while preparing for a surgical procedure. The aim of this study was to assess the level of preoperative fear among cardiac surgery patients and to explore its relationship with age, gender, risk factors for chronic diseases, and type of surgery.

Methods: This cross-sectional study was conducted between January and April 2025 at the Department of Cardiac Surgery, Osijek Clinical Hospital Center. A total of 87 patients aged 30 to 75 years, scheduled for elective cardiac surgery (coronary artery bypass grafting, valvuloplasty, or correction of heart defects), were included. Data were collected using the validated Croatian version of the Surgical Fear Questionnaire (CRO-SFQ), which measures short-term and long-term fear of surgery, as well as a questionnaire covering sociodemographic and clinical variables. Statistical analyses included descriptive methods and non-parametric tests (Mann–Whitney, Kruskal–Wallis, and Wilcoxon Signed-Rank tests), with the level of significance set at $P<0.05$.

Results: The median overall surgical fear score was 36 (IQR 23–42). Women reported significantly higher levels of fear compared with men ($P=0.01$). Higher fear scores were also observed among patients undergoing heart valve replacement or reconstruction compared with those undergoing coronary artery bypass grafting ($P=0.04$). No statistically significant differences in fear levels were found in relation to the presence of chronic disease risk factors.

Conclusion: Surgical fear is prevalent among most cardiac surgery patients, with higher levels observed in women and in those undergoing more complex procedures. Integrating systematic preoperative interventions, including patient education and psychological support, into clinical practice may help reduce the emotional burden associated with surgery.

INTRODUCTION

Fear experienced by patients preparing for surgery is a well-recognized emotional state [1]. Surgical fear refers to the emotional response that patients experience while preparing for a surgical procedure, with a reported prevalence of approximately 60 to 80 percent in various populations [2]. It represents a significant burden for patients, healthcare professionals, and the entire healthcare system [3, 4]. Higher levels of preoperative fear are associated with a range of adverse outcomes, including an increased need for anesthetics and analgesics, prolonged recovery from anesthesia, and delayed overall postoperative recovery [2].

In some patients, fear of surgery also includes fear of anesthesia [5]. Other factors that may influence the level of fear before surgery include the type of planned procedure, the time remaining until surgery, previous surgical experiences, the amount of preoperative information provided, and the patient's age and gender [6, 7, 8].

Results from a study examining fear and anxiety in patients undergoing coronary artery bypass grafting indicate that the greatest fear occurs during the waiting period before surgery [8]. Preoperative assessment of surgical fear provides valuable information for improving preoperative care and postoperative recovery, and it represents the first step in planning targeted interventions. Early identification of patients with high levels of preoperative fear, followed by the implementation of targeted strategies such as education, psychological support, and non-pharmacological techniques, can improve postoperative outcomes, shorten hospital stays, and reduce the need for additional medical interventions [2].

A review of 17 systematic reviews including 188 controlled trials and 16,884 participants suggests that preoperative fear and anxiety can be effectively reduced by non-pharmacological interventions provided by nurses [9]. Interventions such as patient education, audiovisual materials, empathic and patient-centered approaches, massage, and music therapy have been shown to reduce preoperative fear with a low risk of adverse effects [9].

Patients undergoing cardiac surgery face numerous preoperative challenges due to the complexity of the procedure, the high prevalence of comorbidities, and the increased vulnerability of this population [10, 11]. These patients are mostly older adults with reduced cardiovascular reserve and multiple comorbid conditions, which significantly increase the risk of perioperative complications and major adverse cardiac events [10–12]. Guidelines from the Society of Cardiology for Enhanced Recovery After Cardiac Surgery (ERAS), the International Society of Cardiology, and the Society of Thoracic Surgeons (STS) emphasize the need for systematic and comprehensive preoperative evaluation to optimize perioperative outcomes [12]. In this context, the assessment of preoperative fear and anxiety is crucial because these conditions are associated with higher perioperative mortality and morbidity and with prolonged recovery [10–14]. Mood changes, anxiety, depression, and fear in the preoperative period can negatively affect recovery after surgery and trigger an unfavorable neuroendocrine response in the postoperative period [15–19]. Among cardiac surgery patients awaiting surgery, fear of the unknown and insufficient information about the planned procedure are key contributors to high preoperative anxiety [8, 13].

No previous study in Croatia has assessed preoperative fear among patients awaiting elective cardiac surgery. Therefore, the aim of this study was to assess the level of preoperative fear among cardiac surgery patients and to examine its relationship with gender, age, risk factors for chronic diseases, and type of surgery

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METHODS

Study design

A cross-sectional study was conducted.

Setting and samples

The study was conducted at the Osijek Clinical Hospital Center between January and April 2025. Participants were patients admitted to the Department of Cardiac Surgery of the Osijek Clinical Hospital Center 24 hours before an elective procedure.

The inclusion criteria were as follows: patients aged 30 to 75 years scheduled for elective coronary artery bypass grafting (CABG), heart valve replacement (aortic valve replacement, mitral valve replacement), or correction of heart defects, and patients who could speak and read Croatian.

The exclusion criteria were: emergency patients, patients undergoing palliative revascularization, patients younger than 30 or older than 75 years, those with a life expectancy of less than one year, those with cognitive or mental disorders, and patients unable to communicate in Croatian.

A total of 100 questionnaires were distributed. Ten patients declined to participate, and three questionnaires were incomplete. Therefore, 87 patients met the study criteria. No control group was used.

Measurements and instruments

The research instrument consisted of the validated Croatian version of the Surgical Fear Questionnaire (CRO-SFQ) and a questionnaire on general and sociodemographic characteristics of the patients. The validation of the Croatian version of the Surgical Fear Questionnaire among adult patients scheduled for elective surgery was conducted by Karačić et al. [20]. Permission to use this version of the questionnaire for the present study was obtained from the author.

The original questionnaire was developed in the Netherlands to assess fear levels in adult patients awaiting elective surgery [21]. It consists of eight items. A score of 0 indicates "not afraid at all," while a score of 10 indicates "very afraid." The questionnaire includes two subscales: one refers to fear of short-term consequences of surgery (SFQ-s), and the other to fear of long-term consequences (SFQ-l). Items 1 to 4 belong to the SFQ-s, and items 5 to 8 belong to the SFQ-l.

The reliability of the Croatian version, as reported by Karačić et al. [20], was 0.79 for the SFQ-s, 0.84 for the SFQ-l, and 0.81 for the total score. The total level of surgical fear is obtained by summing the scores on both subscales. The total score ranges from 0 to 80, while each subscale ranges from 0 to 40. A higher score indicates a higher level of surgical fear [20].

The second part of the questionnaire included sociodemographic data such as gender, age, marital status, education level, and employment status. The section on clinical variables included the presence of comorbidities, risk factors, and the type of surgical procedure.

Data collection and procedure

Data were collected by means of a survey conducted after admission, that is, 24 hours before surgery. Patients participated voluntarily after receiving detailed information about the study topic and objectives. The survey took approximately 10 to 15 minutes to complete. After providing oral and written informed consent, patients completed the questionnaire at their own pace, and the forms were collected by medical staff during the evening rounds. Questionnaires with incomplete responses were excluded from the analysis. The data were accessible only to the lead researcher.

Ethical considerations

The study was approved by the Ethics Committee of the Clinical Hospital Center Osijek (approval number: R1-14818-4/2024). All participants provided informed consent before inclusion in the study. The research was conducted in accordance with the Declaration of Helsinki. Data collection and storage followed ethical standards and principles of human rights protection in biomedical research.

Statistical data analysis

Descriptive statistical methods were used to describe the frequency distribution of the investigated variables. The Shapiro–Wilk test was used to assess the normality of numerical variables (fear of short-term and long-term consequences of surgery and overall surgical fear), and it showed significant deviation from normality for all variables ($P<0.05$).

Non-parametric statistical tests were therefore used in further analyses, and mean values were expressed as median and interquartile range. The Kruskal–Wallis test was used to assess differences between multiple independent variables, while the Mann–Whitney test was applied to examine differences between two independent variables. The Wilcoxon Signed-Rank test was used to assess differ-

ences between two dependent variables. The level of statistical significance was set at P<0.05. Data were processed using JASP software, version 0.19.3 (Department of Psychological Methods, University of Amsterdam, Amsterdam, The Netherlands).

RESULTS

The study included 87 patients who underwent surgery at the Department of Cardiac Surgery. The majority were male, 67 (77.0%), had completed secondary education, 61 (70.1%), and were married, 69 (57.8%). The median age of the patients was 67 years (interquartile range 60 to 74).

Comorbidities were recorded as multiple-choice responses, and most patients reported having hypertension, 65 (33.3%). The majority of patients underwent coronary artery bypass grafting, 45 (51.7%). According to body mass index, most patients were overweight, 40 (46.0%). A total of 56 patients (64.4%) did not use tobacco products, and 47 (54.0%) did not consume alcohol (Table 1).

Table 1. Sociodemographic data of patients and distribution of comorbidities, risk factors for chronic diseases and types of surgical procedures

Variable		n (%)
Gender		
	Male	67 (77)
	Female	20 (23)
Age		
	60 and younger	24 (27.6)
	61 do 70	33 (37.9)
	71 and older	30 (34.5)
Level of education		
	Elementary school	19 (21.8)
	Secondary education	61 (70.1)
	Undergraduate and graduate degree	7 (8)
Type of employment		
	Retired	62 (71.3)
	Unemployed	10 (11.5)
	Employed	15 (17.2)
Marital status		
	Married	69 (57.8)
	Single	11 (12.6)
	Widow/er	17 (19.5)
Surgical procedure		
	Coronary artery bypass graft	45 (51.7)
	Heart valve replacement or reconstruction	25 (28.7)
	Combined procedure	15 (17.2)
	Correction of heart defects and failures	2 (2.3)
Comorbidities		
	Hypertension	65 (33.3)
	Vascular disease	16 (8.2)
	Kidney disease	10 (5.1)
	Hyperlipidemia	60 (30.8)
	Diabetes	40 (20.5)
	Neurological disorders	4 (2.1)
Medication for chronic diseases		
	Yes	77 (88.5)
	No	10 (11.5)
BMI		
	Malnutrition	0
	Normal body weight	19 (21.8)
	Overweight	40 (46)
	Obesity Class 1	20 (23)
	Obesity Class 2	7 (8)
	Obesity (Severe) Class 3	1 (1.1)
Smoking		
	Yes	31 (35.6)
	No	56 (64.4)
Alcohol		
	Yes	1 (1.1)
	No	47 (54)
	Occasionally	39 (44.8)
		Me (IQR)
Chronological age		67 (60 – 74)
BMI		27.5 (25.2 – 31.2)

Note: n – number of examinees, % - percentage; Me – median; IQR - interquartile range

In the part of the questionnaire related to surgical fear, the highest level of agreement was observed for the item "I am afraid of the surgery" (Me = 5; IQR 3–7). The lowest level of agreement was recorded for the items "I am afraid of side effects," "I am afraid that my health will worsen after surgery," "I am afraid that the surgery will not work," "I am afraid that I will not recover from surgery," and "I am afraid of a long recovery time after surgery" (Me = 3; IQR 2–5) (Table 2).

Table 2. Distribution and descriptive statistics of surgical fear

Surgical fear											
N (%)											Me (IQR)
0	1	2	3	4	5	6	7	8	9	10	
I am afraid of the surgery											
0	3 (3.4)	6 (6.9)	12 (13.8)	13 (14.9)	20 (23)	7 (8)	11 (12.6)	10 (11.5)	2 (2.3)	3 (3.4)	5 (3-7)
I am afraid of being anesthetized											
4 (4.6)	15 (17.2)	20 (23.0)	11 (12.6)	16 (18.4)	10 (11.5)	5 (5.7)	3 (3.4)	3 (3.4)	0	0	4 (2-5)
I am afraid of the pain after the surgery											
2 (2.3)	5 (5.7)	6 (6.9)	13 (14.9)	13 (14.9)	20 (23)	12 (13.8)	8 (9.2)	5 (5.7)	1 (1.1)	2 (2.3)	5 (3-6)
I am afraid of side effects											
1 (1.1)	12 (13.8)	15 (17.2)	16 (18.4)	13 (14.9)	14 (16.1)	8 (9.2)	2 (2.3)	3 (3.4)	1 (1.1)	2 (2.3)	3 (2-5)
I am afraid that my health will worsen after surgery											
4 (4.6)	8 (9.2)	16 (18.4)	16 (18.4)	5 (5.7)	15 (17.2)	8 (9.2)	6 (6.9)	7 (8)	1 (1.1)	1 (1.1)	3 (2-5)
I'm afraid the surgery will not work											
9 (10.3)	7 (8)	14 (16.1)	13 (14.9)	11 (12.6)	10 (11.5)	5 (5.7)	3 (3,4)	10 (11,5)	3 (3,4)	2 (2,3)	3 (2-6)
I am afraid that I will not recover from surgery											
7 (8,0)	9 (10,3)	15 (17,2)	10 (11,5)	7 (8)	12 (13,8)	8 (9,2)	7 (8,0)	7 (8,0)	4 (4,6)	1 (1,1)	3 (2-5)
I am afraid of the long recovery time after surgery											
3 (3.4)	4 (4.6)	9 (10.3)	12 (13.8)	12 (13.8)	12 (13.8)	10 (11.5)	9 (10.3)	9 (10.3)	5 (5.7)	2 (2.3)	3 (2-5)

Note: N – number of examinees; % - percentage; 0 – no fear – 10 – huge fear; Me – median; IQR – interquartile range

The median overall surgical fear score was 36 (IQR 23–42). No statistically significant differences were observed between the levels of fear of short-term and long-term consequences of surgery (Table 3).

Table 3. Descriptive statistics and comparison of differences in short-term and long-term consequences of surgery

Fear of surgical procedure	Me (IQR)	*P**
Fear of short-term consequences of surgery	16 (12 – 21)	0.71
Fear of long-term consequences of surgery	18 (10 – 21)	
Fear of surgical procedure (total)	36 (23 – 42)	

Note: Me – median; IQR – interquartile range; P – statistical significance; *Wilcoxon Sign Rank test

The results showed a statistically significant difference in surgical fear according to patient gender (Mann–Whitney test; *P*=0.01), with women reporting significantly higher levels of surgical fear than men. No statistically significant differences in surgical fear were observed with respect to risk factors for chronic diseases (Table 4).

Table 4. Surgical fear according to sociodemographic variables and risk factors for chronic diseases

Fear of operational procedure		
Variable	**Me (IQR)**	***P***
Gender		
Male	33 (21 – 41)	0.01*
Female	39 (32.50 – 51)	
Age		
60 and younger	34 (23.75 – 39.50)	0.34**
61 do 70	33 (19 – 41)	
71 and older	37 (30 – 45.75)	
Level of education		
Primary education	38 (28 – 52.50)	0.10**
Secondary education	35 (23 – 41)	
College and higher education	32 (18.50 – 40)	
Type of employment		
Retired	36.50 (23 – 42.75)	0.57*
Unemployed	35 (26.75 – 46.25)	
Employed	32 (23.50 – 38)	

Table 4. (continued)

Fear of operational procedure		
Variable	**Me (IQR)**	***P***
Marital status		
Married	37 (26 – 44)	0.10**
Single	18 (16 – 35)	
Widow/er	37 (21 – 40)	
BMI		
Normal body weight	26 (17 – 35.50)	0.10*
Overweight	38 (26 – 45.25)	
Obesity Class 1	34 (23 – 41)	
Obesity Class 2 and 3	37.50 (34.25 – 43)	
Smoking		
Yes	33 (22.50 – 43)	0.45**
No	37 (23 – 41.25)	
Alcohol		
Yes and occasionally	17 (13 – 20.25)	0.88**
No	16 (11.50 – 20.50)	
Medication for chronic diseases		
Yes	37 (24 – 43)	0.20*
No	30.50 (17.50 – 39.50)	

Note: Me – Median; IQR - interquartile range; *P* – statistical significance; *Mann-Whitney test; **Kruskal Wallis test

The results showed a statistically significant difference in surgical fear of long-term consequences (Kruskal–Wallis test; *P*=0.04), with significantly higher levels of fear among patients who underwent heart valve replacement or reconstruction compared with those who underwent coronary artery bypass graft surgery (Table 5).

Table 5. Surgical fear by type of cardiac surgery

Type of cardiac surgery	Me (IQR)	*P**
Fear of short-term consequences of surgery		
Coronary artery bypass graft	17 (11 – 20)	
Heart valve replacement or reconstruction	18 (15 – 21)	0.44
Combined procedure	16 (14 – 17.50)	
Correction of heart defects and failures	13 (10 – 16)	
Fear of long-term consequences of surgery		
Coronary artery bypass graft	14 (8 – 20)	
Heart valve replacement or reconstruction	20 (16 – 22)	0.04
Combined procedure	20 (11 – 25)	
Correction of heart defects and failures	9.50 (4.75 – 14.25)	
Overall fear of operational procedure		
Coronary artery bypass graft	32 (19 – 40)	
Heart valve replacement or reconstruction	37 (30 – 47)	0.17
Combined procedure	37 (25.50 – 43)	
Correction of heart defects and failures	22.50 (14.75 – 30.25)	

Note: Me – median; IQR - interquartile range; *P* – statistical significance; * Kruskal Wallis test

DISCUSSION

The aim of this study was to examine the level of preoperative fear among patients undergoing cardiac surgery. The findings indicate that preoperative fear is present in the majority of patients, with higher levels observed in women and in those undergoing more complex surgical procedures. Studies conducted worldwide show that fear and anxiety during the preoperative period vary according to age, gender, marital status, education level, type of surgery, and anesthesia. Other common fears include concerns about surgery delays, waking up early from anesthesia, postoperative pain, financial loss, and death [22–27].

A study conducted in Croatia produced results consistent with international research, confirming that surgical fear levels are similar across populations [1, 3, 21, 22]. These findings also support the validity of the Croatian version of the SFQ as a reliable self-assessment tool for measuring surgical fear in adults undergoing elective procedures [1, 3, 20–22].

In this study, patients reported the highest levels of preoperative fear in questionnaire items related to fear of surgery and postoperative pain. These results are consistent with other studies in which patients also rated fear of surgery and postoperative pain as the most prominent concerns [20, 28]. The mean total fear score in this study was 36 points. In comparison, studies conducted in Sri Lanka [29], the Czech Republic [30], and Turkey [3] reported mean SFQ scores of 31.8, 35.7, and 37.55 points, respectively, while a previous Croatian study reported a mean score of 22.65 [20]. A study of patients awaiting cataract surgery reported a markedly lower mean SFQ score of 8.2 [1], which is considerably lower than values reported for general surgical procedures. These findings suggest that the intensity of surgical fear varies depending on the type of procedure performed.

A Turkish study found that fear levels were higher among patients undergoing neurosurgery and thoracic surgery under general anesthesia, indicating that those awaiting larger and more complex operations tend to experience greater fear [23]. The present study confirmed this trend, showing significantly higher levels of long-term surgical fear in patients undergoing heart valve replacement or reconstruction compared with those undergoing coronary artery bypass grafting.

Patients awaiting cardiac surgery may experience considerable anxiety and uncertainty. A longitudinal study of patients undergoing coronary artery bypass grafting found that fear and anxiety levels fluctuated at three time points: while waiting for surgery at home, during hospitalization the night before surgery, and three months postoperatively. The highest levels were recorded during the waiting period at home, while lower levels were observed in the hospital and at three months after surgery [8].

Several studies have demonstrated that anxiety and fear during the preoperative and postoperative periods after cardiac procedures can negatively affect recovery, contributing to a higher rate of complications, longer hospital stays, and reduced effectiveness of cardiac rehabilitation programs [31]. In Spain, a study found that the prevalence of preoperative anxiety and depression among cardiac surgery patients was 32 percent and 19 percent, respectively. A hospital stay longer than three days before surgery was identified as a major risk factor for preoperative depression. Furthermore, preoperative anxiety was significantly associated with increased postoperative pain and higher analgesic consumption. Anxiety and depression are common mood disorders among cardiac surgery patients over 65 years of age, and prolonged preoperative hospitalization appears to heighten the risk of developing these conditions. The authors therefore recommend minimizing preoperative hospital stays to reduce the emotional burden on patients [32].

The burden associated with coronary artery disease in patients undergoing coronary artery bypass grafting has increased significantly in recent decades, resulting in a higher risk of intraoperative and postoperative complications. This increase is linked to older patient age, a higher proportion of women, a greater incidence of recent myocardial infarction, reduced left ventricular function, multivessel disease, and more comorbidities [33]. Identifying factors that influence preoperative fear and understanding their interrelationships are essential for planning targeted interventions. According to patients themselves, conversation and communication with healthcare staff are among the most effective ways to reduce fear and anxiety [34]. Educating patients about the surgical procedure is also an important approach to decreasing surgery-related fear [29].

The results of this study indicate that surgical fear is gender specific, with women reporting significantly higher levels of fear than men, which is consistent with other studies [30, 35]. This difference may be related to hormonal factors, such as estrogen and progesterone, which influence women's emotional state, as well as psychosocial stress related to family responsibilities [36]. In contrast, men may be less likely to express fear because doing so could be perceived as a sign of emotional vulnerability or weakness [35]. However, some studies have reported no significant gender differences in preoperative fear [29].

In this study, no significant difference in preoperative fear was observed by age. A study from Turkey found that younger patients reported higher levels of fear compared with older patients [23]. Lower fear levels among older individuals may be related to greater familiarity with the hospital environment, as older patients often seek medical care for chronic conditions and may view aging as a natural process associated with acceptance of mortality. Conversely, other studies have shown that increasing age may actually heighten fear of surgery [1, 29, 30].

In the present study, patients with lower education levels had higher fear scores than those with higher education, although the difference was not statistically significant. The role of education level remains unclear because of inconsistent findings across studies. Some research found no significant relationship [8], whereas other studies showed that higher education was associated with lower levels of fear [1]. Preoperative education may reduce uncertainty and surgical fear, helping patients to be better emotionally prepared. Studies that incorporated preoperative education have demonstrated its beneficial effect on the emotional state of patients, particularly in terms of postoperative rehabilitation [37].

Study Limitations and Future Research Directions

This study has several limitations. First, it was conducted on a relatively small sample of patients. Second, the research was carried out at a single clinical center, which limits the generalizability of the findings to the broader population of cardiac surgery patients. Future studies should include larger, mul-

ticenter samples to improve the external validity of findings on preoperative anxiety in cardiac surgery.

Longitudinal research is needed to examine the persistence of preoperative fear and its impact on postoperative outcomes, including recovery trajectories and quality of life. Further investigations should also assess the effectiveness of structured preoperative education programs, with an emphasis on tailoring content to specific surgical procedures (for example, valve replacement versus coronary artery bypass grafting) and demographic groups (for example, gender differences). Additionally, qualitative studies may provide deeper insight into patients' subjective experiences of preoperative fear and their expectations regarding surgery.

Implications for Clinical Practice and Education

The findings suggest that implementing standardized preoperative education and psychological support interventions may reduce uncertainty and preoperative fear among cardiac surgery patients, thereby improving emotional preparedness and potentially enhancing postoperative recovery. Integrating individualized educational modules into routine preoperative care could be particularly beneficial for high-risk groups, such as women and patients undergoing more complex procedures.

For nursing and medical education, these findings underscore the importance of training healthcare professionals in communication skills, psychological support techniques, and the delivery of evidence-based educational interventions. Incorporating these competencies into educational curricula could promote a more patient-centered approach to perioperative care.

CONCLUSIONS

A moderate level of preoperative fear was observed among cardiac surgery patients. Women reported significantly higher levels of preoperative fear compared with men. No significant differences in fear levels were found with respect to patient age. Patients undergoing heart valve replacement or reconstruction exhibited higher levels of fear of long-term consequences compared with those undergoing coronary artery bypass surgery. The overall level of preoperative fear did not differ significantly according to education level, marital status, employment status, or the presence of risk factors.

Funding sources

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Author Contributions

Conceptualization, A.K., S.P. and N.F.; Methodology, Ž.M., M.B and I.B.; Software, A.K., Ž.M. and J.V.; Validation, J.V., M.B. and I.B.; Formal Analysis, Ž.M. and I.B.; Investigation, A.K., S.P., M.B. and S.L.; Resources, A.K., S.P. and S.L.; Data Curation, A.K. and S.P.; Writing – Original Draft Preparation, A.K., S.P. and N.F.; Writing – Review & Editing, A.K., S.P., J.V., Ž.M., M.B., S.L., I.B., and N.F.; Visualization, Ž.M., J.V., M.B. and S.L.; Supervision, I.B. and N.F.; Project Administration, A.K. and M.B.

Declaration of Conflicting Interest:

The author declares no conflict of interest.

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