

NAZIV DISERTACIJE: JAVNO-ZDRAVSTVENI ZNAČAJ I PROCJENA RIZIKA SIGURNOSTI HRANE U DOMAĆINSTVIMA**Autor: Daniel Maestro****Mentor: Prof. dr. Arzija Pašalić****Datum odbrane: 25.05.2022.****DOI: <https://doi.org/10.17532/DD.2022.02>****SAŽETAK**

Uvod: Pravilnom pripremom hrane moguće je prevenirati većinu hranom prenosivih bolesti. Zdravstveni autoriteti izvještavaju o značajnim naporima u prevenciji ovih bolesti, ali i nedostatku podataka o stvarnom broju oboljelih. Značajni naponi uloženi u usaglašavanje legislative na širim geografskim područjima, rezultirali su formiranjem općeprihvaćenog stava da je većina kupljenih namirnica sigurna za konzumiranje. Međutim, neophodno je da potrošači nastave dobre prakse rukovanja, pripremanja i čuvanja namirnica u domaćinstvima. Upravo zbog postojanja naučnih praznina nužno je istražiti izvore mikroorganizama u kuhinjskom okruženju, te kroz evaluaciju znanja, stavova, i prakse osoba koje rukuju hranom u domaćinstvima steći polazno stajalište za formulisanje i dizajniranje programa za promociju i edukaciju stanovništva o sigurnosti hrane u domaćinstvima.

Ispitanici i metode: Istraživanje je provedeno kao presječna, deskriptivno-analitička i eksperimentalna studija u periodu novembar 2020. – juli 2021. godine. Saglasnost za provođenje istraživanja kojim je obuhvaćeno 384 domaćinstva na području Kantona Sarajevo dobivena je od Univerziteta u Sarajevu. Mikrobiološka analiza briseva je provedena u akreditiranoj laboratoriji Odjela za mikrobiološku analizu namirnica, voda i predmeta opšte upotrebe pri Zavodu za javno zdravstvo Federacije Bosne i Hercegovine. Kao instrument istraživanja znanja, stava i prakse stanovništva o sigurnosti hrane u domaćinstvima korišten je prethodno kreiran i validiran „Upitnik o sigurnosti hrane u domaćinstvima“ (Cronbach's alpha=0,842). U domaćinstvima je uzorkovano po 7 briseva radnih površina i pribora u kuhinjama (n=2681) u skladu sa smjernicama standardne metode BAS EN ISO 18593:2019 – Horizontalne metode za uzimanje uzoraka sa površine. Određivanje broja mikrobioloških kontaminanata provedeno je prema standardnim metodama BAS EN ISO 6888-1:2005 – Horizontalna metoda za brojanje koagulaza pozitivnih stafilocoka *Staphylococcus aureus* i druge vrste, BAS ISO 21528-2:2018 – Horizontalna metoda za detekciju i određivanje broja Enterobacteriaceae i BAS EN ISO 4833-1:2014 – Horizontalna metoda za brojanje kolonija na 30 °C tehnikom izlivanja podloge. Ukupni rizik u domaćinstvima je prema kreiranoj matrici podijeljen u tri kategorije: niski (0-10), srednji (11-20), visoki (21-40). Za statističku obradu podataka korišten je

program IBM SPSS Statistics 26.00, a primijenjene su metode deskriptivne i interferencijalne statistike, sa pragom statističke značajnosti od $p \leq 0.05$.

Rezultati: Evaluacijom znanja, stava i prakse utvrđeno je da dobro znanje i stav ima 62% i 66,7% ispitanika, a praksu približno jedna petina (18,2%). U više od polovine domaćinstava (61,5%) izolovane su ciljane bakterije u vrijednostima iznad referentnih. Najveća odstupanja u bakteriološkoj ispravnosti utvrđena su na radnim površinama u kuhinjama (45,8%), daskama za rezanje (34,1%) i slavinama (34,1%). *Staphylococcus aureus* je izolovan u 153, Enterobacteriaceae u 151, a aerobne bakterije u 286 domaćinstava. Prema kategorizaciji ukupnog rizika, 17% domaćinstava na području Kantona Sarajevo spada u kategoriju visokog rizika od hranom prenosivih bolesti u svojim domaćinstvima. Najznačajniji prediktori ukupnog visokog rizika u domaćinstvima su osobe starije od 51 godine, nizak nivo obrazovanja, status samca, prisustvo kućnih ljubimaca i štetnika u kuhinjskom prostoru i neodgovarajuće temperature frižidera. Utvrđeno je postojanje statistički značajne povezanosti ($p < 0,001$) između kategorija ukupnog rizika sa dijelom interesnih varijabli i to učestalost probavnih smetnji na godišnjem nivou, prisustvo štetnika i kućnih ljubimaca u domaćinstvu, te temperatura frižidera. Na osnovu regresionog modela je uočeno da i praksa i znanje i stav imaju utjecaj na ukupni rizik.

Zaključci: Na području Kantona Sarajevo, stanovništvo ima dobro znanje i stavove u pogledu sigurnosti hrane, dok su dobre higijenske prakse u pripremanju i skladištenju namirnica nezadovoljavajuće. Više od polovine ispitivanih kuhinjskih površina i pribora za jelo u domaćinstvima na području Kantona Sarajevo je mikrobiološki neispravno, a kao najrizičnija mjesta za razvoj potencijalnih patogena identifikovane su kuhinjske radne površine i daske za rezanje. Približno polovina domaćinstava na području Kantona Sarajevo je u riziku od nastanka hranom prenosivih bolesti, a više od petine je u kategoriji visokog rizika. Direktan utjecaj na kategorizaciju rizika imaju znanje, stav i praksa ispitanika. Najznačajniji prediktori ukupnog visokog rizika u domaćinstvima su osobe starije od 51 godine, nizak nivo obrazovanja, status samca, prisustvo kućnih ljubimaca i štetnika u kuhinjskom prostoru i neodgovarajuće temperature frižidera. Obzirom da javnost nije upoznata sa rizikom u kojem se nalazi, smatramo da je što hitnije potrebno poduzeti korake u podizanju kolektivne svijesti o javno-zdravstvenom značaju sigurnosti hrane u domaćinstvima

DISSERTATION TITLE: PUBLIC HEALTH SIGNIFICANCE AND FOOD SAFETY RISK ASSESSMENT IN HOUSEHOLDS**Author: Daniel Maestro****Mentor: Prof. dr. Arzija Pašalić****Date of defence: 25. May 2022.****DOI: <https://doi.org/10.17532/DD.2022.02>****ABSTRACT**

Introduction: Proper food preparation can prevent most food-borne diseases. Health authorities report significant efforts in the prevention of these diseases, but also a lack of data on the real number of patients. Significant efforts have been made to harmonize legislation in wider geographical areas, which has resulted in the formation of a generally accepted public view that most food purchased is safe to consume. However, it is essential that consumers continue good practices in handling, preparing and storing food in households. Due to the existence of scientific gaps, it is necessary to investigate the sources of microorganisms in the kitchen environment, and through the evaluation of knowledge, attitudes and practices of food handlers in households to gain a starting point for formulating and designing programs to promote and educate the population on food safety.

Participants and methods: The research was conducted as a cross-sectional, descriptive- analytical and experimental study in the period November 2020 - July 2021. Consent to conduct a survey covering 384 households in the Sarajevo Canton was obtained from the University of Sarajevo. Microbiological analysis of swabs was performed in the accredited laboratory of the Department for microbiological analysis of food, water and items of general use at the Institute of Public Health of the Federation of Bosnia and Herzegovina. The previously created and validated "Household Food Safety Questionnaire" (Cronbach's alpha = 0.842) was used as an instrument for researching the knowledge, attitudes and practices of the population on household food safety. In households, 7 swabs of work surfaces and utensils in kitchens (n = 2681) were sampled in accordance with the guidelines of the standard method BAS EN ISO 18593: 2019 - Horizontal methods for sampling from the surface. Determination of the number of microbiological contaminants was performed according to standard methods ISO 4833-1: 2014 - Horizontal method for colony counting at 30 ° C by substrate pouring technique. According to the created matrix, the total risk in households is divided into three categories: low (0-10), medium (11-20), high (21-40). IBM SPSS Statistics 26.00 was used for statistical data processing, and methods of descriptive and interference statistics were applied, with a threshold of statistical significance of $p \leq 0.05$.

Results: The evaluation of knowledge, attitude and practice found that 62% of respondents have good knowledge, 66.7% have good attitude, and approximately one fifth (18.2%) have good practice. In more than half of the households (61.5%), target bacteria were isolated in values above the reference values. The largest deviations in bacteriological criteria were found on kitchen worktops (45.8%), cutting boards (34.1%) and faucets (34.1%). *Staphylococcus aureus* was isolated in 153, Enterobacteriaceae in 151, and aerobic bacteria in 286 households. According to the categorization of the total risk, 17% of households in the Sarajevo Canton belong to the category of high risk of food poisoning in their homes. The most significant predictors of overall high risk in households are people over the age of 51, low level of education, single status, the presence of pets and pests in the kitchen environment, and inadequate refrigerator temperatures. The existence of statistically significant correlation ($p < 0.001$) between the categories of total risk with a part of interest variables was determined, namely the frequency of indigestion on an annual level, the presence of pests and pets in the household, and the temperature of the refrigerator. Based on the regression model, it was observed that practice, knowledge and attitude have an impact on overall risk.

Conclusions: In the Sarajevo Canton, the population has good knowledge and attitudes regarding food safety, while good hygiene practices in food preparation and storage are unsatisfactory. More than half of the examined kitchen surfaces and cutlery in households in the Sarajevo Canton are microbiologically defective, and kitchen worktops and cutting boards have been identified as the most risky places for the development of potential pathogens. Approximately half of the households in the Sarajevo Canton are at risk of developing food-borne diseases, and more than a fifth are in the high-risk category. The knowledge, attitude and practice of the respondents have a direct influence on the categorization of risks. The most significant predictors of overall high risk in households are people over the age of 51, low level of education, single status, the presence of pets and pests in the kitchen space, and inappropriate refrigerator temperatures. Given that this problem is rarely discussed in our area and that the public is not aware of the risk it is in, we believe that it is urgent to take steps to raise collective awareness of the public health importance of food safety in households.