

FUNCTIONAL, DYSFUNCTIONAL IMPULSIVITY AND SENSATION SEEKING IN MEDICAL STAFF

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SUMMARY

Background: It is important to study impulsivity and sensation seeking in medical staff because they might shed light into the effectiveness of decision-making processes and performed responses. The aims of this study were to specify if functional impulsivity prevailed in medical staff compared to dysfunctional impulsivity; how strong the relationships between functional, dysfunctional impulsivity and sensation seeking were; furthermore, it aimed to differentiate functional and dysfunctional impulsivity, according to the size of the place where medical care was practised.

Subjects and methods: A sample of 323 medical workers and 99 medical students filled in Radoslavova and Velichkov's (2005) questionnaire measuring sensation seeking, functional impulsivity and dysfunctional impulsivity.

Results: Sensation seeking and functional impulsivity in medical staff did not differ statistically significantly ($t_{(421)}=1.171$, $p=0.242$), but functional impulsivity was significantly more intensive than dysfunctional impulsivity among medical personnel ($t_{(421)}=8.132$, $p<0.001$). Sensation seeking was significantly more strongly expressed than dysfunctional impulsivity among medical specialists ($t_{(421)}=7.388$, $p<0.001$). Correlation analysis revealed that sensation seeking in medical specialists was more strongly related to functional impulsivity than to dysfunctional impulsivity ($p<0.001$). The studied medical staff practicing in the capital were more prone to functional impulsivity than the medical staff practicing in towns up to 50,000 inhabitants ($p_{Tukey}=0.007$).

Conclusions: This was the first study to reveal stronger relationships between functional impulsivity and sensation seeking in medical staff than between dysfunctional impulsivity and sensation seeking which were interpreted as an influencing factor of the quality of decision-making responses. Functional impulsivity prevailed over dysfunctional impulsivity in medical occupations, so decision-making in medical care should be more effective and timelier than inappropriate, especially for medical personnel working in the capital.

Key words: dysfunctional impulsivity - functional impulsivity - medics - sensation seeking

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INTRODUCTION

It is important to study impulsivity and sensation seeking in medical staff, because impulsivity influences on effectiveness of decision-making and performed responses (Arce & Santisteban 2006, Dickman 1990, Pitts & Leventhal 2012, Zdravec et al. 2005), on orientation towards hedonistic experiences (Slavchov & Virmozelova 2007). Sensation seeking is a personality feature expressed as an inclination to search for some novel, intense, and varied experiences (World Health Organization 2020), a striving for exciting experiences (Dodonov 1978, World Health Organization 2020) related to well-being (Ravert et al. 2013) and characterized with activity and decisiveness (Franken 1988). Sensation seekers extremely mobilize their own physical and mental abilities to achieve a sense of power over danger and experience ecstatic emotions (Dodonov 1978).

It has been established that emergency medical personnel are highly sensation seeking-oriented, especially young medical employees working full-time (Chng & Eaddy 1999). Sensation seeking positively correlates with functional and dysfunctional impulsivity in youth (Stoyanova & Ivantchev 2021), but scientific literature

regarding the relationships between impulsivity and sensation seeking in medical staff is scarce.

Impulsivity is a personality feature that expresses the tendency to act immediately and non-deliberately to some stimulus without considering risks and consequences before acting, because of an inability to delay gratification and due to a desire for recent rewards (World Health Organization 2020). Functional impulsivity is characterized with quick, accurate, effective information processing (Pitts & Leventhal 2012, Zdravec et al. 2005) and optimal acting (Dickman 1990) with positive outcomes, while dysfunctional impulsivity features with taking quick ineffective decisions (Pitts & Leventhal 2012, Zdravec et al. 2005). Impulsivity is a part of Impulse control disorders that involve various behaviours such as explosive outbursts in interpersonal relationships, fire-setting, kleptomania (stealing), sexual behaviour related to exercising violence, gambling, game addiction, substance use, etc. (World Health Organization 2020). Impulse control disorders include a repeated failure to resist an impulse to perform an act that is rewarding to the person in a short-term perspective, but it has some negative consequences for the individual and/or other people in the long-term future (World Health Organization 2020).

The specialists in helping occupations rarely are impulsive (Boyadjieva 2014), but they are prone to sensation seeking (Chng & Eaddy 1999), and because sensation seeking positively correlates with functional and dysfunctional impulsivity (Stoyanova & Ivantchev 2021), it has been expected that sensation seeking in medical staff would be related more strongly to functional impulsivity than to dysfunctional impulsivity. It has also been expected that functional impulsivity would be more manifested in medical care specialists than dysfunctional impulsivity. Besides, it has been found that dysfunctional impulsivity increases with the increase of the size of place of living, as well as with the increase of density of population of place of living (Giannouli & Stoyanova 2019) which gives some reasons to expect higher impulsivity in medical personnel living and working in the capital and bigger cities compared to small places of residence and practice. The aims of this study were 1) to specify which type of impulsivity prevailed in medical staff; 2) how strong the relationships between functional, dysfunctional impulsivity and sensation seeking were; 3) to explore the difference between functional and dysfunctional impulsivity, according to the size of place of practicing medical care.

SUBJECTS AND METHODS

A cross-sectional study was conducted in 2018. It was approved by Department of Psychology at South-West University "Neofit Rilski" and conformed to the general principles outlined in the Declaration of Helsinki (World Medical Association, Inc. 2008). The subjects gave informed consent and they participated voluntarily and anonymously, without any incentives or penalties. The sample was purposefully selected to consist of medical staff and medical students. The inclusion criterion was based on the participants in the study having to perform any medical service/activity related to physical or mental health at the time of the study.

Subjects

The participants in the study were recruited in several hospitals and universities among those who agreed to participate voluntarily. They were 422 and 323 out of them were medical workers (54 medical doctors with different specialties, 63 nurses, 58 midwives, 8 speech and language therapists, 20 kinesitherapists, 29 psychotherapists, 91 consultative and clinical psychologists), whilst 99 out of them were medical students who already practiced in hospitals. The male participants were 99 (23.5%; 19 studying and 80 working medical specialists) and the female participants were 323 (76.5%; 80 studying and 243 working medical specialists). Binomial test revealed that their proportions differed statistically significant ($p < 0.001$), so the female subjects were about three times more than the male subjects, because the studied nurses and midwives were only female.

Nine of them (2.1%) worked in villages, 114 (27.1%) worked in towns up to 50,000 inhabitants, 241 (57.1%) worked in cities with more than 50,000 inhabitants, and 58 (13.7%) worked in the capital of Bulgaria. Multinomial test indicated that their proportions statistically significant differed (Multinomial $\chi^2(3) = 282.370$, $p < 0.001$) from the expected count in each sub-group of workplaces ($N = 106$).

They revealed that their annual family income varied from low ($N = 111$; 26.3%), through medium ($N = 212$; 50.2%) to high ($N = 99$; 23.5%). Multinomial test indicated that their proportions statistically significant differed (Multinomial $\chi^2(2) = 54.773$, $p < 0.001$) from the expected count in each sub-group of annual family income ($N = 141$).

Their age varied from 24 to 41 years old. Their age was not normally distributed (Shapiro-Wilk test coefficient = 0.791, $df = 422$, $p < 0.001$). Their median age was 26 years old. Interquartile range was 2 years. Most participants (73.5%) were from 24 to 27 years old.

Instrument

Radoslavova and Velichkov's (2005) questionnaire measuring sensation seeking, functional impulsivity and dysfunctional impulsivity was applied. It was created for Bulgarian population based on Dickman's (1990) ideas and on Zuckerman, Kolin, Price and Zoob's (1964) ideas. Its scale of sensation seeking consists of 24 dichotomous items (for example, item 17 "I enjoy in new situations when I cannot predict how the things will turn out", and item 25 "I like travelling without a plan, direction or time constraints"), whose Cronbach's alpha was .80 (Radoslavova & Velichkov 2005). Radoslavova and Velichkov's scale of functional impulsivity consists of 10 dichotomous items (for example, item 18 "I would like a job that requires immediate decisions to be made repeatedly", and item 28 "I have proven many times that I can handle tasks that require fast and accurate actions"), whose Cronbach's alpha was .75 (Radoslavova & Velichkov 2005). Radoslavova and Velichkov's scale of dysfunctional impulsivity consists of 18 dichotomous items (for example, item 23 "I often do or say something without thinking about the consequences", and item 39 "I often make commitments without thinking about whether I can fulfill them"), whose Cronbach's alpha was .81 (Radoslavova & Velichkov 2005).

Statistical analysis

Data are published in Mendeley data repository (Stoyanova 2020). Data were statistically processed by means of JASP 0.14 (JASP Team 2020). JASP is a free software that permits calculation of statistical coefficients, effect sizes and confidence intervals.

The scores on the scales of Sensation seeking, Functional impulsivity and Dysfunctional impulsivity were averaged (i.e., the score on each scale was divided

into the number of items of the scale) for comparing them. Descriptive statistics were calculated. Binomial and multinomial tests were performed for comparing the proportions of sub-groups of participants. The paired sample t-test for comparing the intensity of the studied variables in medical staff was applied. Correlation analysis was applied for establishing the connections between them. ANOVA was performed for comparisons between functional and dysfunctional impulsivity of the medical staff practicing in settlements of different sizes, and 9 participants practicing in villages were excluded from the analysis, because Johanson and Brooks (2010) recommended at least 12 participants in a group for group comparisons.

RESULTS

The participants' scores on sensation seeking, functional and dysfunctional impulsivity (see Table 1) were normally distributed, because their coefficients of skewness and kurtosis ranged between -1 and +1, i.e. their distribution approximated normal data distribution (Hair et al. 2016).

Sensation seeking and functional impulsivity in medical staff did not differ statistically significantly (see Table 2), but functional impulsivity was significantly more intensive than dysfunctional impulsivity among medical personnel, and sensation seeking also was significantly more intensive than dysfunctional impulsivity among medical specialists (see Table 1 and Table 2). The effect size Cohen's *d* was small towards medium (above 0.2, but below 0.5), according to Cohen (1988).

Sensation seeking in medical specialists was more strongly related to functional impulsivity than to dysfunc-

tional impulsivity – see correlation coefficients in Table 3. These correlations remained statistically significant even if controlled for age ($r_{\text{sensation seeking} - \text{functional impulsivity}}=0.287, p<0.001$; $r_{\text{sensation seeking} - \text{dysfunctional impulsivity}}=0.263, p<0.001$; $r_{\text{functional impulsivity} - \text{dysfunctional impulsivity}}=0.242, p<0.001$), annual family income ($r_{\text{sensation seeking} - \text{functional impulsivity}}=0.281, p<0.001$; $r_{\text{sensation seeking} - \text{dysfunctional impulsivity}}=0.272, p<0.001$; $r_{\text{functional impulsivity} - \text{dysfunctional impulsivity}}=0.241, p<0.001$), and size of place of practice ($r_{\text{sensation seeking} - \text{functional impulsivity}}=0.277, p<0.001$; $r_{\text{sensation seeking} - \text{dysfunctional impulsivity}}=0.273, p<0.001$; $r_{\text{functional impulsivity} - \text{dysfunctional impulsivity}}=0.240, p<0.001$).

There were not any statistically significant differences between medical specialists working in the capital, cities, and towns in their averaged scores on their dysfunctional impulsivity ($F(2, 410)=1.747, p=0.176$).

There were some statistically significant differences between the medical specialists working in the capital, cities and towns in their averaged scores on their functional impulsivity ($F(2, 410)=4.867, p=0.008, \eta^2=0.023$, i.e. small effect size, according to Lenhard & Lenhard 2016). The studied medical staff practicing in the capital were more prone to functional impulsivity than the medical staff practicing in towns up to 50,000 inhabitants ($p_{\text{Tukey}}=0.007$, see Table 4). There was a trend, but not statistically significant that the medical staff practicing in the capital were more prone to functional impulsivity than the medical staff practicing in cities with more than 50,000 inhabitants ($p_{\text{Tukey}}=0.211$, see Table 4). There was a trend, but not statistically significant that the medical staff practicing in cities with more than 50,000 inhabitants were more prone to functional impulsivity than the medical staff practicing in towns with less than 50,000 inhabitants ($p_{\text{Tukey}}=0.087$, see Table 4).

Table 1. Means, standards deviations, skewness, and kurtosis of medics' averaged scores on sensation seeking, functional and dysfunctional impulsivity

	Sensation seeking	Functional impulsivity	Dysfunctional impulsivity
Mean	0.520	0.533	0.435
Standard deviation	0.187	0.199	0.203
Skewness	-0.010	-0.093	0.020
Kurtosis	-0.470	-0.107	-0.717

Table 2. Paired sample T-test for comparing the averaged scores on sensation seeking, functional and dysfunctional impulsivity

Measure 1	Measure 2	$t_{(421)}$	p	Effect Size Cohen's <i>d</i>	Lower 95% CI for Effect Size	Upper 95% CI for Effect Size
Sensation seeking	Functional impulsivity	-1.171	0.242	-0.057	-0.152	0.038
Sensation seeking	Dysfunctional impulsivity	7.388	<0.001	0.360	0.261	0.458
Functional impulsivity	Dysfunctional impulsivity	8.132	<0.001	0.396	0.297	0.495

Table 3. Correlation coefficients between sensation seeking, functional and dysfunctional impulsivity in medical staff

		<i>n</i>	Pearson's <i>r</i>	<i>p</i>	Lower 95% Confidence Interval	Upper 95% Confidence Interval
Sensation seeking	Functional impulsivity	422	0.283	<0.001	0.193	0.369
Sensation seeking	Dysfunctional impulsivity	422	0.274	<0.001	0.184	0.360
Functional impulsivity	Dysfunctional impulsivity	422	0.242	<0.001	0.150	0.330

Table 4. Averaged scores on functional impulsivity in medical staff working in capital, cities, and towns

Place of practicing medical care	Mean	Standard deviations	N
Capital	0.588	0.188	58
City more than 50,000 inhabitants	0.539	0.203	241
Town up to 50,000 inhabitants	0.492	0.186	114

DISCUSSION

The findings corroborated the hypothesis that sensation seeking in medical staff would be related more strongly to functional impulsivity than to dysfunctional impulsivity. These results corresponded with the previous findings that the specialists in medical care and helping occupations were prone to sensation seeking (Chng & Eaddy 1999), and sensation seeking positively correlated with functional and dysfunctional impulsivity (Stoyanova & Ivantchev 2021).

The findings supported the hypothesis that functional impulsivity would be more manifested in medical care specialists than dysfunctional impulsivity that may be due to their education and practice that had prepared them to make timely precise and effective decisions concerning human health and life.

Functional impulsivity among medical personnel practicing in the capital was more manifested compared to functional impulsivity among medical personnel practicing in towns with less than 50,000 inhabitants, that in some degree corresponded to the findings that Bulgarian youth's dysfunctional impulsivity increased with the augmentation of the size of place of living, as well as with the augmentation of density of population of place of living (Giannouli & Stoyanova 2019).

This study had some limitations related to using only subjective measures of different types of impulsivity and sensation seeking in medical specialists that were vulnerable to social desirability. The testing condition of anonymity should have reduced their social desirability. A part of our sample consisted of Bulgarian medical students and it was found that Bulgarian students were less prone to social desirability than the students in other 19 countries (He et al. 2015) that also may reduce the effect of social desirability on responding to these scales.

Another limitation was the non-representative sample for Bulgarian medical staff. However, statistical power

of the Pearson correlation method that was applied within the sample consisting of 422 participants was at least 0.99 calculated by means of the software GPower 3.1.9.2 (Faul et al. 2007) that was high sensitivity (Glen 2015).

CONCLUSION

This was the first study to reveal stronger relationships between functional impulsivity and sensation seeking in medical staff than between dysfunctional impulsivity and sensation seeking which were interpreted as an influencing factor of the quality of decision-making responses that might be due to medical education and practice. It was found that functional impulsivity prevailed over dysfunctional impulsivity in medical occupations, so decision-making in medical care should be more effective and timelier than inappropriate, especially for the medical personnel working in the capital. Future cross-cultural studies of the relationships between sensation seeking, and functional and dysfunctional impulsivity in medical specialists from different regions all over the world may further contribute to scientific knowledge in this regard.

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Contribution of individual authors:

All authors contributed to this manuscript by means of taking part into designing the study, literature search, statistical analysis, data interpretation, manuscript writing, and revising the manuscript draft.

References

1. Arce E & Santisteban C: *Impulsivity: A review*. *Psicothema* 2006; 2:213-220
2. Boyadjieva NI: *Empathy, emotional intelligence and personal profile of helping specialists for socio-pedagogical work*. In Dzhonev S, Dimitrov P & Mateeva N (eds): *Sbornik nauchni dokladi ot sedmiya natsionalen congress po psihologia*. Sofia, 31.10-02.11.2014 [Proceedings of the 7th national congress of Psychology. Sofia, 31.10-02.11.2014], 534-542. LMLTD Press, 2014
3. Chng C & Eaddy S: *Sensation seeking as it relates to burnout among emergency medical personnel: A Texas study*. *Prehospital and Disaster Medicine* 1999; 4:36-40
4. Cohen J: *Statistical power analysis for the behavioral sciences*. 2nd ed. Lawrence Erlbaum Associates, Hillsdale, NJ, 1988
5. Dickman SJ: *Functional and dysfunctional impulsivity: Personality and cognitive correlates*. *Journal of Personality and Social Psychology* 1990; 1:95-102
6. Dodonov BI: *Emotsia kak tsennost' [Emotion as a value]*. Politizdat, Moscow, 1978
7. Faul F, Erdfelder E, Lang, A-G & Buchner A: *G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences*. *Behavior Research Methods* 2007; 39: 175-191
8. Franken RE: *Sensation seeking, decision making styles, and preference for individual responsibility*. *Personality and Individual Differences* 1988; 1:139-146
9. Giannouli V & Stoyanova S: *Youth impulsivity in Southern Bulgaria*. *European Psychiatry* 2019; Supplement 1: S35. doi:10.1016/j.eurpsy.2019.01.003
10. Glen S: *Statistical power: What it is, how to calculate it*. *FromStatisticsHowTo.com: Elementary Statistics for the rest of us!* 2015. <https://www.statisticshowto.com/statistical-power/>
11. Hair JF, Hult GTM, Ringle CM & Sarstedt M: *A primer on partial least squares structural equation modeling (PLS-SEM)*. 2nd edition. Sage, Thousand Oaks, CA, 2016
12. He J, Van De Vijver FJR, Espinosa AD, Abubakar A, Dimitrova R, Adams BG et al.: *Socially desirable responding: Enhancement and denial in 20 countries*. *Cross-Cultural Research* 2015; 3: 227-249
13. JASP Team: *JASP (Version 0.14) [Computer software]*. 2020, <https://jasp-stats.org/faq/>
14. Johanson GA & Brooks GP: *Initial scale development: Sample size for pilot studies*. *Educational and Psychological Measurement* 2010; 3: 394-400
15. Lenhard W & Lenhard A: *Calculation of effect sizes*. 2016. https://www.psychometrica.de/effect_size.html
16. Pitts SR & Leventhal AM: *Associations of functional and dysfunctional impulsivity to smoking characteristics*. *Journal of Addiction Medicine* 2012; 3: 226-232
17. Radoslavova M & Velichkov A: *Metodi za psihodiagnostika [Methods for psychodiagnostics]*. Pandora prim, Sofia, 2005
18. Ravert RD, Schwartz SJ, Zamboanga BL, Donnellan MB, Kim SY, Weisskirch RS, Ham LS & Bersamin MM: *The association between sensation seeking and well-being among college-attending emerging adults*. *Journal of College Student Development* 2013; 1:17-28
19. Stoyanova S: *Functional, dysfunctional impulsivity and sensation seeking in medical staff*, *Mendeley Data*, v1. 2020, <http://dx.doi.org/10.17632/vdc47tmgmb.1>
20. Stoyanova S & Ivantchev N: *Associations among functional and dysfunctional impulsivity: Direct and indirect effects on sensation seeking in youth (19-25 years old)*. *Psychological Thought* 2021; 14:115-149
21. World Health Organization: *ICD-11 for mortality and morbidity statistics (Version: 09/2020)*. <https://icd.who.int/browse11/l-m/en>
22. World Medical Association, Inc: *Declaration of Helsinki. Ethical principles for medical research involving human subjects*. 2008. <https://www.wma.net/wp-content/uploads/2018/07/DoH-Oct2008.pdf>
23. Zadavec T, Bucik V & Sočan G: *The place of dysfunctional and functional impulsivity in the personality structure*. *Horizons of Psychology* 2005; 2:39-50
24. Zuckerman M, Kolin EA, Price L & Zoob I: *Development of a sensation-seeking scale*. *Journal of Consulting Psychology* 1964; 6:477-482

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