

STUDY ABOUT HOW EMOTIONAL PERCEPTION OF THE TYPE OF CALL AFFECTS EMERGENCY PERSONNEL RESPONSE

MARIUS SMĂRĂNDOIU¹, ADRIANA STĂNILĂ²

¹Sibiu Mobile Emergency Service for Resuscitation and Extrication (SMURD), General Inspectorate for Emergency Situations (IGSU), ²“Lucian Blaga” University of Sibiu

Keywords: SMURD, emotion, reaction, decision, pre-hospital

Abstract: Introduction: The work of Romanian Mobile Emergency Service for Resuscitation and Extrication known as SMURD teams is highly dependent on the gravity of a call: the more critical a patient, the shorter the time of reaction is. Emergency teams develop an adapted response pattern dependent on the type of the call that jeopardize the quality of pre-hospital action. Materials and methods: Statistical analysis of SMURD national database on a period of 3 years out of which the average ambulance time of response was calculated for different pathologies, time intervals and type of ambulances. Results: Rescue teams speed their way to an emergency such as road accidents trauma but have a slower response for calls like unconsciousness and respiratory failure. When a cardiac arrest (dispatched as “possible cardiac arrest”) is called, the time response improves by 15%. Conclusions: Emergency Medical Service (EMS) response pattern is built upon experience and encountered dramatic situations and not necessarily as a result of objective medical condition.

INTRODUCTION

New findings in the science of emotion have been expressed in the last years, bringing into the light that important decisions and reactions are mostly influenced by human emotions. The studies reveal that emotions constitute powerful, pervasive, and predictable drivers of decision making.(1)

This can be found across different domains and medicine field makes no difference, so important regularities appear in the mechanisms through which emotions influence reactions and behaviours. The work of Romanian SMURD EMS is highly dependent on the gravity of a call: the more critical a patient, the shorter the time of reaction is. When dealing with an unusual situation or a critical patient, the rescuers push their boundaries furthermore to ensure a good outcome of the situation. Experience has taught us that not all critical reported emergencies are indeed life threatening thus leading in developing an adapted response pattern dependent on the type of the call. This aspect can jeopardize the quality of pre-hospital action in reaction time and possibly medical maneuvers. About the nature of emotion, it is widely accepted by psychologists that: “emotions are irrational passive and emotions alter actions”.(2)

“Any action taken based on emotion is not a decision, but a reaction” (3), so the goal of this national study is to identify the emergency priority scale of SMURD teams based on reaction time as a result of their subjective experience and the aspects that can be improved in order to deliver a more accurate and correct action instead of simple reactions. This aspect could improve a lot the pre-hospital performances for the benefit of patients.

MATERIALS AND METHODS

The study is based on statistical analysis of SMURD national database (589873 cases) for a period of 3 years (2010 - 2012). The database is reorganized in such way to allow complex mathematical processing based on Structured Query Language (SQL) interrogation. The average Emergency Medical Services (EMS) time of response is calculated against several selected relevant parameters in order to express the common behaviour.

A selection of pathologies attended is chosen like road accidents, occupational accidents, burns, failings, chest pain, aggression, unconsciousness, shortness of breaths. Another important parameter chosen is time interval. It is well known that the time of the medical call has a big influence on the reaction of the emergency teams. That is why we measured this by comparing different time intervals like night, day, mornings, or afternoons.

Time parameter is extremely important in any analysis of human reaction as it is demonstrated that reaction depends a lot on time.

Besides this we compare the reactions of different type of ambulances (Type C and Type B), meaning Mobile Intensive Care Unit (MICU) and only paramedic ambulances.

RESULTS

Rescue teams all over the country speed their way to an emergency such as road accidents and other traumatic injuries but have a slower response for calls like unconsciousness and respiratory failure.

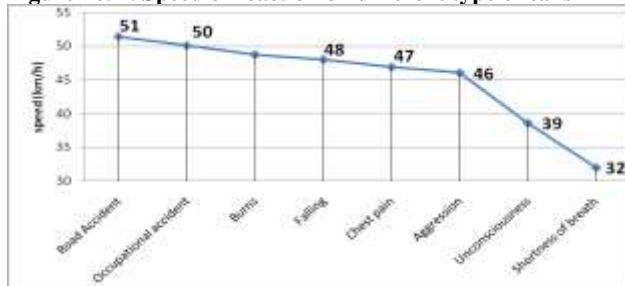
This pattern is present irrespectively of other variables like type of EMS and time of the day.

¹Corresponding author: Marius Smărăndoiu, Str. Lucian Blaga, Nr.2A, Sibiu, România, E-mail: mariussibiu@yahoo.com, Phone: +40269 436777
Article received on 03.08.2021 and accepted for publication on 26.11.2021

For road accidents (43129 cases) we have an average reaction speed of 51 km/h (sd=24) comparing with unconsciousness alerts (87127 cases) having only an average reaction speed of 39 km/h (sd=21) (figure no.1).

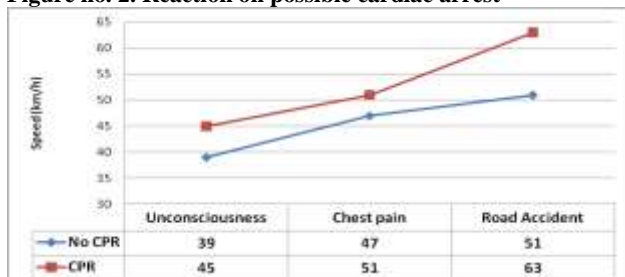
A possible explanation for such a low reaction speed in this case could be the result of numerous false alarms and abuse of the 112 emergency services (another conducted study shows that only 38% of unconscious alerts are unconscious patients).

Figure no. 1. Speed of reaction on different type of calls



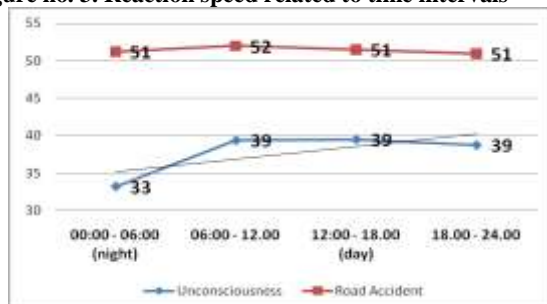
When unconsciousness and respiratory failure alerts are associated with the possibility of a cardiac arrest (dispatched as “possible cardiac arrest”), the time response improves with an average of 15%. Reaction speed for unconsciousness cases (87127) improves from 39 km/h (sd=21) to 45 km/h (sd=23). Because of this association with a possible cardiac arrest, EMS teams recognize the case as a threatening life situation and the time of reaction improves. There is a feeling that false alarms risk decreases in this case so EMS teams speed up.

Figure no. 2. Reaction on possible cardiac arrest



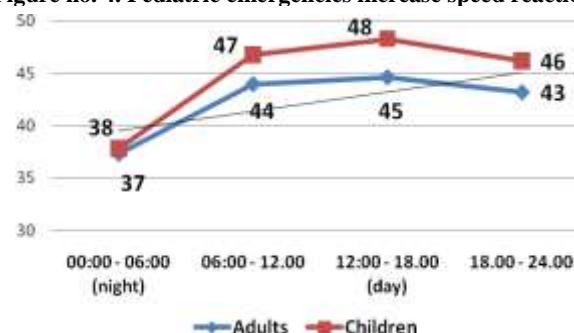
Comparing the trends for different time intervals (day > night), although the average speed tends to remain the same for trauma emergencies (51 km/h), for unconscious and respiratory failure cases the average speed falls (39 km/h -> 33 km/h) (figure no. 3). It seems that EMS teams do not take for granted dispatched cases when it comes to unconsciousness and shortness of breath and one plausible explanation could be the fact that the majority cases being dispatched under this symptom turned out to be other than life threatening emergencies revealing an important indicator of trust in this kind of emergency.

Figure no. 3. Reaction speed related to time intervals



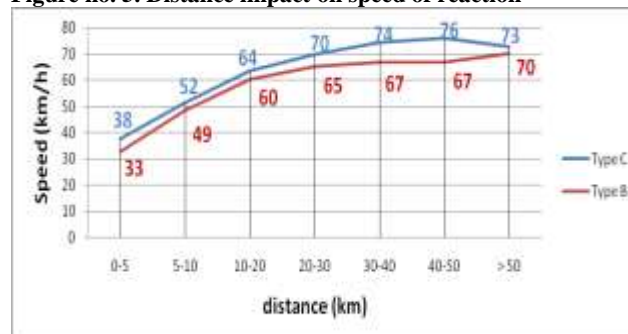
Another aspect taken into consideration is the type of the patient. EMS teams tend to speed up more when they deal with pediatric emergencies comparing with adults no matter of other variables like time of incident or distance (figure no. 4).

Figure no. 4. Pediatric emergencies increase speed reaction



Distance to the emergency site has an important impact on the speed of reaction. When it comes to short distances, under 5 km, a Type C ambulance reacts with a speed of 38 km/h (sd=16) whereas when longer distances are to be covered, over 40 km, the speed increases up to 76 km/h (sd=20). This pattern can be observed in both type B and C ambulances (figure no. 5).

Figure no. 5. Distance impact on speed of reaction



DISCUSSIONS

Human beings, regardless being health professionals or not, are always subject to emotional driven reactions on specific contexts like time or location. The processing of emotion-laden information, such as threat, is fast and prioritized and emotions are adaptive insofar as they prompt actions that are beneficial to the organism, so it generates unexpected and undesired behaviours.(3)

As Givot David declares, “... anyone who has worked in or around this field knows that knee-jerk reactions are so common in EMS management that they have become the norm, the expectation, the standard and it has to STOP!”.(4)

Understanding this phenomenon and taking measures to reduce its impact could improve a lot the outcome. So, we suggest a deeper thought and strategic decisions to be taken to improve the attitude. A basic function of the motor system of all beings is to protect the body from attack, so escape reaction is the most urgent survival strategy being influenced by context proximity like an acute medical case that do not suffer delays.(5)

Paediatric medical calls, accidents or trauma, in general, seems to motivate more the EMS teams than other type of medical issues. Unfortunately, this does not reflect how urgent the case is so hazardous misconception seems to impact more the speed of reaction bringing more risk of medical failure. Emergency medical response in paediatric cases still represents an important subject because of lack of structured data and

sensitivity of the subject.(7).

More and more different artificial intelligence tools are being taken into consideration to possibly facilitate the judgement of callers' emotional states during dispatch conversations. Such model like has the potential to be utilised in practice, by pre-screening emotionally stable callers, thus allowing dispatchers to focus on cases that are judged to be emotionally unstable. Mathematical models and predictions are to be taken into consideration to create such helpful tools.(8)

As more and more professional activities are connected online, having an increased access of computing capabilities, professional human reaction on specific situations like medical emergencies could be improved in such ways to compensate as much as possible the emotional influence.(9)

CONCLUSIONS

In the end nothing good or productive has ever come from a subjective and emotional reaction in EMS or anywhere else and this is highlighted in current study results.

When dealing with trauma, rescuers achieve a better time of response. EMS response pattern is built upon experience and encountered dramatic situations and not necessarily because of objective medical condition.

Pediatric emergencies have a better time of response comparing with adults.

Uncertainty and false emergency calls are more frequently encountered with unconsciousness, shortness of breath, this leading to a poorer reaction time comparing with trauma, road accidents.

When extra details about the dispatched cases associated with false recognition of a critical situation are available, the attitude of EMS team changes.

More and more psychological scientists now assume that emotions are the dominant driver of most meaningful decisions in life or profession (6), but medical field decision should escape this trend.

Technology could be used to improve subjective emotional impact on medical profession.

REFERENCES

1. Whitener S. How Your Emotions Influence Your Decisions. Forbes Coaches Council; 2018.
2. Brady MS. The irrationality of recalcitrant emotions, Springer Science Business Media; 2008.
3. Lima Portugal LC, Alves RCS, Orlando Fernandes O. Interactions between emotion and action in the brain, *NeuroImage*. 2020;214.
4. Givot D. S.T.O.P. knee-jerk reactions in EMS. *The Legal Guardian*; 2013.
5. Bastos AF, Vieira AS, Oliveira JM, Oliveira L, Pereira MG, Figueira I, Erthal FS, Volchan E. Stop or move: Defensive strategies in humans, *Behavioural Brain Research*. 2016;302.
6. Keltner D, Oatley K, Jenkins JM, Understanding emotions. Hoboken, NJ: Wiley; 2014.
7. Genovesi AL, Edgerton EA, Ely M, Hewes H, Olson LM. Getting More Performance Out of Performance Measures: The Journey and Impact of the EMS for Children Program, *Clinical Pediatric Emergency Medicine*. 2108;19(3).
8. Kuan-Chen Chin, Tzu-Chun Hsieh, Wen-Chu Chiang, Yu-Chun Chien, Jen-Tung Sun, Hao-Yang Lin, Ming-Ju Hsieh, Chi-Wei Yang, Albert Y. Chen, Matthew Huei-Ming Ma. Early recognition of a caller's emotion in out-of-hospital cardiac arrest dispatching: An artificial intelligence approach, *Resuscitation*. 2021;167.
9. Qiao Yu, Wenjing Xiao, Sheng Jiang, Mohammed F. Alhamid, Ghulam Muhammad, M. Shamim Hossain.

Emotion-aware mobile edge computing system: A case study, *Computers & Electrical Engineering*. 2021;92.