

## PHONE CALLER OF PUNJAB EMERGENCY SERVICE (RESCUE 1122) AS 1<sup>ST</sup> RESPONDER: A NOVEL PARADIGM

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### ABSTRACT

*Present research aims to establish the placement of phone caller of Punjab Emergency Service (PES, Rescue 1122) as 1<sup>st</sup> responder in the hierarchy of emergency-dealing units. In contrast to generally-considered 1<sup>st</sup> responder i.e. trained emergency personal; it is purely a novel paradigm. The telephone numbers of the phone callers, calling PES control room Sialkot city (Pakistan) during 1<sup>st</sup> February to 30<sup>th</sup> April, 2016 were collected from the same office after getting written departmental permission. A sample (n = 261) was selected using systematic sampling technique. Each participant was informed about the objective of the study telephonically before recording the responses in a pretested questionnaire. The questionnaire included 3 sections entitled socio-demographic characteristics, initial proceedings (included 8 items), and security & rescue (included 8 items). The items were measured on 5-point Likert scale, rating strongly disagree (1) to strongly agree (5). Results showed a comparatively higher frequency (67.4%, n = 176) of male respondents after SPSS-based statistical analysis. Most of the responses (93.9%, n = 245) indicated lack of first aid training. After chi-squared test, significant association (P= 0.0001) was noticed between gender and involvement-based loss minimization perception of the participants. Physical participation of the caller through initial proceeding in the scene and role in rescue activities was evident via highly remarkable values of normalized importance i.e. 100 and 62.2%, respectively using Multilayer perception neural network technique. Conclusively, the phone caller was found as 1<sup>st</sup> responder after its apparent importance in initiating emergency chain, physical participation in the emergency scene and the loss-minimization perception.*

**Keywords:** Phone caller, Punjab Emergency Service, Rescue 1122, 1<sup>st</sup> responder, Novel paradigm

### INTRODUCTION

An emergency is nothing but a situation which causes sudden risk to life and (or) property. It needs urgent interference of emergency services to prevent the situation from further worsening. In Pakistan, Punjab Emergency Service (PES, commonly called Rescue 1122) is a first leading emergency humanitarian service (*Associated Press of Pakistan*, 2014). “Community safety awareness program” for safer life is one of its priorities (Punjab Emergency Service, 2016).

The Rescue 1122 can easily be accessed through toll free dialing on 1122 using landline or mobile phones. Just like 112 in Europe (Cabo *et. al.*, 2014), easy to remember and quicker to dial characteristics of the number accelerates the emergency response. Person using call tracking identification software receives the call, collects the information and communicates to the wireless operator to dispatch the requisite service(s). In certain cases, the control room

passes advice to the caller about provision of the first aid e.g. cardiopulmonary resuscitation (CPR) and bleeding control till the approach of the support services.

First responder is a person (from emergency service) who is amongst the first people to arrive at emergency site for assistance. The role of the responder necessitates both, physical and mental fitness to cope with stress and uncertainty related with the condition (Hagler, 2012). Similarly, basic life support (BLS) or first aid training is considered mandatory for such officials to deal with medical and other emergencies.

Generally, frequency of road traffic accidents is followed by medical emergency in Punjab (a province of Pakistan). Emergency services cannot access to every emergency scene instantly due to certain constrains. Unluckily, there is also severe deficiency of trained community members. Now, only laypersons/bystanders left who rush to incidence site without delay, summon to 1122, and may participate in rescue and safety activities. Just like emergency service (Cruz, 2016), the bystander perceives that his/her participation reduces the loss of the incidence in term of life and property. Based on roles, the layperson/bystander may be called as community 1<sup>st</sup> responder. However, literature is not available in this context and research gap exists. In this scenario, the present study aims to establish the placement of phone caller of Punjab Emergency Service (PES, Rescue 1122) as 1<sup>st</sup> responder in the hierarchy of emergency dealing objects.

## SIGNIFICANCE OF RESEARCH

First responder is a courageous person who jumps into the incidence scene, ignoring stress and uncertainty related with the condition (Hagler, 2012). Present research on caller of Rescue 1122 may motivate concerned authorities to reconsider the hierarchy of emergency dealing objects for further planning. Social scientists can get benefits from it to frame new research lines on 1<sup>st</sup> responder. It will develop a passion of first aid training and fire prevention in the community. Its outcome may support in neutralization of a wrong perception - females do not participate in emergency incidences.

## LITERATURE REVIEW

According to authors (Latif *et. al.*, 2008), initiation of an integrated emergency/rescue plan is based on summon to emergency service. The emergency unit dispatches the required support and remains in contact with the rescuers. The caller may be even android technology fitted in the motor vehicle (Dhanalakshmi *et. al.*, 2016). On road side accident (RTA), the device sends signals to relatives, emergency service, and nearby hospital about the precise location of the incidence site to reduce the post-accident loss.

Significant improvement in survival after cardiac arrest occurs (Bobrow *et. al.*, 2016) when telephonic caller, bystander performs out-of-hospital cardiopulmonary resuscitation as per continous advices from emergency service. According to a research team Waalewijn *et. al.* (2001), the rate of cardiac rehabilitation using out-of-hospital cardiopulmonary resuscitation (CPR) owes to efficacy of every link of the survival chain for patients older than 17 years. An epidemiological research (Mawani *et. al.*, 2016) on OHCA (out-of-hospital cardiac arrest) indicates almost null survival outcome in countries with less resources.

Trained bystander definitely performs better at the emergency site. In a cluster randomized study (Nord *et. al.*, 2016), DVD-based group (50 min training) of bystander students shows superior CPR skills compared to mobile application (app)-based group (30 min training) in a follow-up of 6 months. A previous study (Naqvi *et. al.*, 2011) concluded that children retain the basic life-saving skills for longer period after learning and performing them with reasonable accuracy.

The outcome of the RTA -based injuries depends upon magnitude of the injuries, level of early care at the scene, and time to reach the hospital. According to author (Getahun, 2015) in Ethiopia, taxi drivers have considerable gaps in knowledge, attitude and skill to deal the incident scene. So, they are not so efficient in decreasing mortality and disabilities. In RTAs, considerable number (about 1/3<sup>rd</sup> of the total) of the victims die before arrival at the hospital (Khorasani-Zavareh *et. al.*, 2009) due to mishandling by the untrained people.

According to a research (Hortensius *et. al.*, 2016), the people with more sympathetic perception promptly indulge in the scene while with more personal distress refrain to do so. Responsiveness in emergency is a social psychology (Plötner *et. al.*, 2015). In the presence of bystanders, some people fail to help. Reciprocal to it, encouragement by elders enhances the helping power of the youth.

It is general perception of the helping layperson that his/her particular support helps in lessening the overall loss of the case. It is the same as emergency service perceives after managed involvement in emergency or disaster such as horrifying flood (Cruz, 2016). According to a motivational study (Kulik, 2016) on 472 volunteers, people in late adolescence have higher motives of social solidarity and of escape from reality through volunteering than in middle and late adulthood. A study on old-aged people (Okun *et. al.*, 2016) states that circumstances-based volunteer cessation deprives the community from the underlined benefits of volunteering such as volunteer satisfaction and enjoyment.

Research team of the present work explored different sources e.g. published articles during literature review. Three aspects of the caller i.e. initiation of the emergency chain, active participation in the incidence, and perception of loss reduction have been investigated, separately. It was concluded that there was not a single evidence of research (especially in Pakistan) showing importance of caller to emergency service e.g. the Rescue 1122.

## **OBJECTIVE**

To establish the placement of phone caller of PES (Rescue 1122) as 1<sup>st</sup> responder in the hierarchy of emergency-dealing objects

## **METHODOLOGY**

The telephone numbers of the phone callers, calling PES control room Sialkot city (Pakistan) during 1<sup>st</sup> February to 30<sup>th</sup> April, 2016 were collected from the same office after written departmental permission. A sample (n = 261) was selected using systematic sampling technique. A questionnaire was designed with close-ended questions. It had three sections entitled socio-demographic characteristics, initial proceedings (included 8 items), and security & rescue (included 8 items). The items were measured on 5-point Likert scale, rating strongly disagree (1) to strongly agree (5). The questionnaire was pretested in a pilot study. Fifty (n = 50) people were contacted telephonically and responses were recorded in the questionnaire. During main study, consent of each responder was obtained before responses.

Coded data of socio-demographic characteristics was subjected to SPSS (version 14) in Windows 2007. Significant association ( $\alpha = 0.05$ ) between socio-demographic characteristics and “importance of the callers” was calculated using chi-square test. Multilayer Perception Neural Network (MLP NN) technique was applied to know the normalized importance of the independent variables towards importance of the callers (dependent variable).

## **DATA ANALYSIS**

Two hundred and sixty one (261) selected emergency telephone callers of the Rescue 1122, Sialkot were interviewed telephonically to fill the pretested questionnaire. No any non-

responsiveness or delay was noticed from the respondents' side. Different percent frequencies were observed against various category of a socio-demographic characteristic, as shown in Table 1. Gender-wise, male respondents were comparatively higher with percent frequency of 67.4% (n = 176) than others. Similarly, vast majority of the responses (68.2%, n = 178) indicated education level of Matriculation or above. Remarkably, higher number of the responses i.e. 51% (n = 133) reported services as profession. In case of residence of the respondents, urban residence had a little edge with 51.3% (n = 134) over its counterpart (rural). Surprisingly, only 6.1% (n = 16) of the study callers were equipped with first aid training to deal with the emergency situations.

**Table 1. Socio-demographic characteristics of responders (n = 261)**

Characteristic	Category		
	Percent frequency (number, n)		
Gender	Male	Female	Shemale
	67.4 (176)	32.6 (85)	0 (0)
Education level	Uneducated	Primary	Matric+
	11.5 (30)	20.3 (53)	68.2 (178)
Profession	Studies	Services	Business
	12.6 (33)	51 (133)	36.4 (95)
Residence	Rural	Urban	
	51.3 (134)	48.7 (127)	
First aid training	No	Yes	
	93.9 (245)	6.1 (16)	

Different socio-demographic characteristics showed different statistical association with the involvement-based, loss-minimization perception of the phone caller in the emergency using chi-squared test (Table 2a). Only gender had statistically strong significant association ( $P = 0.0001$ ) with the perception. However, rest of the 4 characteristics i.e. education, profession, residence and first aid training indicated insignificant association. The data, presented in Table 2b highlighted the cross tabulation (cross tabs for short) of gender and the perception. All the female (n = 85) and most of the male (n = 144) participants perceived that their participation minimized the loss of the incidence.

**Table 2a. Association of characteristic with importance of caller (n = 261)**

Characteristic	p-value (at $\alpha = .05$ )
Gender	0.001
Education	0.910
Profession	0.781
Residence	0.553
First aid training	0.449

**Table 2b. Cross tabulation between gender and loss-minimization perception of caller (n = 261)**

		Gender		Total
		Female	Male	
Perception	No	0	32	32
	Yes	85	144	229
Total		85	176	261

Model summary (Table 3a) developed when finalized data set was presented to Multiple-Layer Perception Neural Network (MLP NN) technique. Percent incorrect prediction of training sample (11.5) is comparatively lesser than that of testing sample. So, there is more than 85% correct prediction in each, training and testing samples. The data of the Table 3b revealed the Case processing summary (Table 3b) with included cases ‘N’. Training sample has been assigned 192 cases which constitute 73.8% of the population while testing is with 68 cases (26.2% of population).

**Table 3a. Model summary for percentage incorrect prediction of the samples**

<i>Phase</i>	<i>Percent incorrect prediction</i>
Training	11.5
Testing	13.2

**Table 3b. Case Processing Summary of the MLP neural network (n =261)**

<i>Sample</i>		<i>N</i>	<i>Percent</i>
<i>Sample</i>	Training	192	73.8
	Testing	68	26.2
<i>Valid</i>		260	100.0
<i>Excluded</i>		1	
<i>Total</i>		261	

Classification of the samples (Table 3c) showed the percent correctness of each category in each sample. There was high percentage of right cases in the training sample (88.5% overall percent correct). However, there appeared some contradiction between the values of observed and predicted categories in the whole data of the Table. There emerged 4 groups of the cases viz. (i) correctly placed ‘Yes’: 228, (ii) correctly placed ‘No’: 1, (iii) incorrectly placed ‘Yes’: 0, and (iv) incorrectly placed ‘No’: 31.

**Table 3c. Classification of phases by Multilayer Perception (MLP) Neural Network**

<i>Sample</i>	<i>Observed</i>	<i>Predicted</i>		<i>Percent Correct</i>
		<i>No</i>	<i>Yes</i>	
Training	No	0	22	0.0%
	Yes	0	170	100.0%
	Overall Percent	0.0%	100%	88.5%
Testing	No	1	9	10.0%
	Yes	0	58	86.8%
	Overall Percent	0.0%	100.0%	85.5%

*Dependent Variable:* involvement-based, loss-minimization perception of the phone caller

Sensitivity analysis of input variables by MLP Neural Network presented a clear picture of normalized importance of the factors towards loss-minimization perception of the callers (Fig 1). Here, percentage normalized importance was found maximum (100%) against initial response (proceeding). However, other component of the physical participation of the responder i.e. security and rescue showed a value of 62.2%.

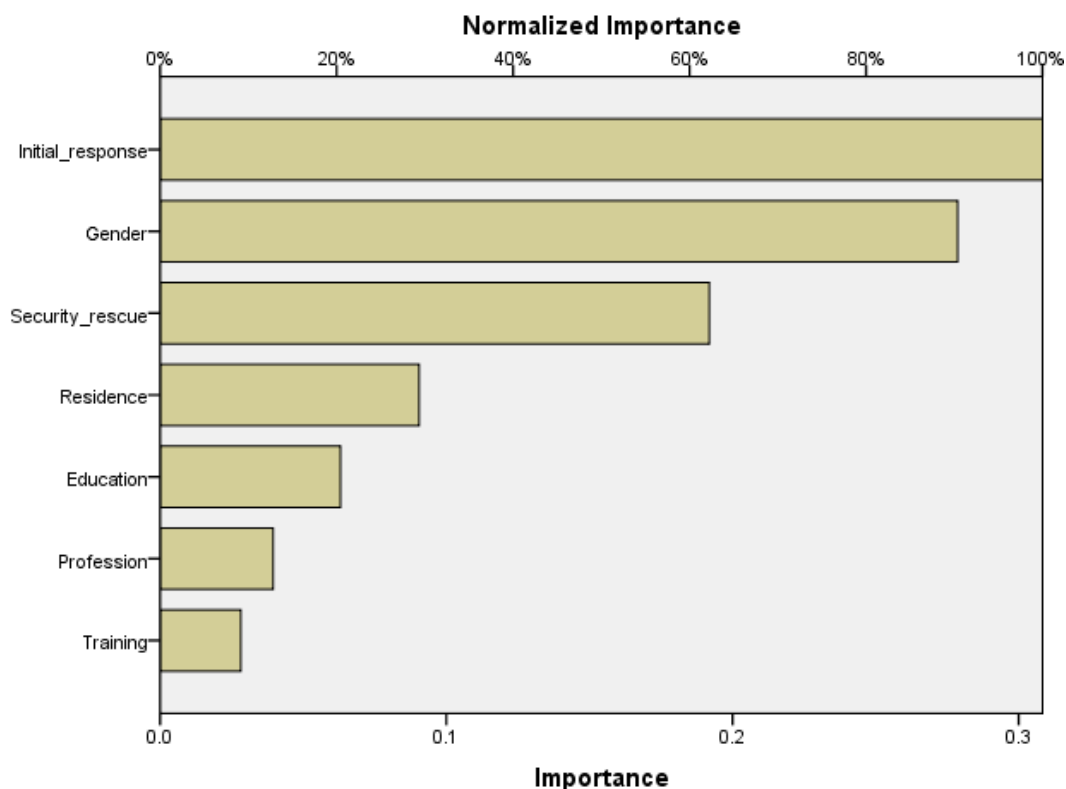


Figure 1. Normalized importance of the factors towards involvement-based, loss-minimization perception of the caller

## FINDINGS AND DISCUSSION

Researchers of the present study reached to the following findings after subjecting the collected data of the questionnaire-based responses of the callers (n = 261) to SPSS for analysis:

Compared to females, more than double the percent frequency in males can be seen in the light of their availability at the incidence sites e.g. road side accident, and emotional conduct. However, females are generally active during medical emergencies like cardiac issues.

Existence of relatively higher frequency against the education level (Matriculation plus) clearly indicates the education-oriented confidence building to step forward during emergency situation.

Covering of more than half (i.e. 51%) of the responses by professionally service men is a matter of interest. The parallel scenario of need-based volunteer role with responsibilities of services highlights the personal integrities of the responders.

Outcome of almost equal frequency (%) of rural and urban residents advocates the generally accepted version “Humanity is independent of geopolitical territories”. Shoulder to shoulder involvement of both kinds of residents is a sign of harmony.

A trained person for First aid keeps the situation from becoming bad to worse by securing the scene and providing temporary treatment before arrival of the professionals. Unluckily, the statistics of the trained persons (only 6.1%) in present study show the weaker trends of the people towards this serious subject.

Output of significant association ( $P = 0.0001$ ) between gender and importance of the callers can be visualized positively with reference to opinion making about importance of caller. Contrary to it, spectrum of the opinion is broad as it is independent of other characteristics *viz.* education, profession, residence, and First Aid training. Appearance of 32 males (after cross tabulation), negating importance of callers in emergency is an astonishing observation which needs to be addressed, specifically.

Higher normalized importance of the callers against initial response of the responder (e.g. willingness, information provision to Rescue 1122) throws light on the active participation of the respondent in the incidence scene before arrival of Rescue 1122 team. Similarly, security and rescue role of the participant has measurable weightage in determination of the importance of the caller in emergency.

## CONCLUSION

According to Anderson and Brown (2010), steeper hierarchy provides more benefits to all the ranks than flatter one". This research is based on perception of the callers of Punjab Emergency Service (commonly called Rescue 1122 – a pre-hospital service) towards their importance in the hierarchy as first responders. Out of the total sample size (261) of the survey under hand, majority of the respondents gave positive opinion about their role in minimizing the loss in the incidences. The perception was found widespread in both the genders i.e. males and females. Other areas of the study like initial proceeding of the caller, and security & rescue activities of the responders also showed importance in making the perception. Conclusively, the researchers found phone caller as "1<sup>st</sup> responder" on the basis of importance of phone call; and caller's physical participation and general perception in minimization the loss of the incidence.

## RECOMMENDATIONS

To enhance the efficiency of phone caller as 1<sup>st</sup> responder in emergency, following measures should be taken:

1. Introduction of GPS (Global Positioning System) for rapid, exact location of the incidence site.
2. Speeding up the first aid training program for the general mass to minimize overall loss.
3. Appreciation of phone caller (1<sup>st</sup> community responder) to Rescue 1122 at all the forums.

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