

Perception of Search and Rescue Crew of Malaysian Police Air Wing towards General Issues of Search and Rescue

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Abstract- Search and Rescue (SAR) is a process of searching for individuals and rescuing those that are in danger. In Malaysia, several agencies are involved in SAR. One of them is the Malaysian Police Air Wing. We had posed several SAR issues to the crew of SAR of the Malaysian Police Air Wing and we had given them leverage whether to agree, disagree, or remain neutral pursuant to these issues. The results were analyzed and a majority of the crew agreed that SAR had save lives while other issues showed mixed responses.

Index Terms- Aviation Search and Rescue, Search and Rescue Training and Operations

I. INTRODUCTION

Search and Rescue (SAR) can be actuated through several modes whether it is via land, sea, or air. In Malaysia, the Police Air Wing is equipped with several aeroplane and helicopters to perform aerial SAR. The crew of the Police Air Wing were trained to be proficient in the usage of aerial equipment and vehicles.

The American Society for Testing and Materials (ASTM) had laid out several procedures and management systems to be used by personnel when performing or actuating SAR [1]. ASTM had also developed standards for equipment or vehicles to be utilized for SAR operations, whether it is for land, sea, or air [1]. The activities of ASTM is in pursuant to our research as we had touched upon the issue of SAR management in our analyses.

Bezgodov had introduced a method to efficiently perform searches at seas or oceans. Bezgodov used Complex Network Model to represent the pattern or characteristics of objects, such as crashed airplanes or humans, that drifted in lieu with the oceanic waves, current, and wind [2]. Such advances are welcomes as it would ease the burden of SAR personnel.

According to Statheropoulos, one of the issues affecting SAR is the approach or the management of SAR operations. Statheropoulos confided that if the management of SAR operations is efficient, SAR could be concluded swiftly and without unwanted wastage of resources [3]. Statheropoulos had indicated that future development of a rigid and concrete management approach is within grasp [3].

Shabani had indicated that clues or information regarding location of objects, vehicles, or humans to be searched and rescued are sometimes incomplete and without pertinent details [4]. This poses an encumbrance to the SAR efforts and delays the effort to save precious lives. Shabani had proposed a new optimization algorithm to counter this predicament and he noted that this new algorithm is somehow competitive when compared to other existing algorithms [4].

Joshi had argued that variations of Likert Scale existed because certain researchers were inclined to measure certain sentiments of the respondents [5]. Joshi further stated that the Likert Scale gives opportunities to the researchers to capture perceptions of the respondents in lieu with the issues that are being investigated [5]. This augur well with our research where our research was implemented for the purpose of capturing the attitudes of the SAR crew with respect to certain SAR issues. We had used the 3 Point Likert Scale for our research.

Lehmann mentioned that the 3 Point Likert Scale had been validated by various researchers and is suitable to be used in numerous occasions [6]. He gave examples where researchers had utilized the 3 Point Likert Scale due to it's convenience and the scale has passed certain reliability tests [6].

II. LITERATURE REVIEW

According to McMurdo, one of the prominent issues in SAR is the predicament of identifying the smallest possible location of victims within a short period of time [7]. To effectively perform this identification, SAR crew should be well trained in order to correctly and accurately interpret the data or information received. This hence would ensure swift SAR operation and action. We dealt with this issue of training in our research and in this paper.

Reid stated that one of the criteria to perform an efficient SAR is the availability of well trained crews [8]. He gave examples of SAR missions that were performed from the year 2013 till 2017 where data collected during this 5 year span were analyzed to show contrasting features of SAR conducted by civilian and military agencies [8]. We in fact had touched upon and analyzed the issue of training in our research and the results were shown in the results section of this paper.

One of the issues in SAR is the optimization of rest for the SAR crew where this is part of SAR human resource management. Jenkins pointed out that during SAR operations, most crew were deprived of sleep and this had decreased the performance of the crew [9]. Jenkins had studied the sleeping pattern of a set of crew and suggested that the resting period of the crew be optimized or the crew's schedule be properly utilized as this would enhance the productivity and performance of the crew [9].

Another aspect which is vital for SAR crew is the demanding fitness level that is required of each crew member. SAR crew would usually undergo professional fitness training to increase or retain their fitness. We had this issue parlayed to the respondents of our research and this is inline with the study conducted by Silk where he commented that physical fitness is utterly important for individuals involved in SAR [10]. He further analyzed tasks performed by SAR crew and deduced that most of the tasks requires high amount of muscle strength. This thus further cemented the correctness of our approach in conveying to the respondents the issue of professional training.

One issue which is grave in SAR is the risk factor. Several risks are inherent during an SAR operation. We were particularly interested in the experiences of each individual in the SAR team where we had posed the issue of experiences to our respondents. Inexperience individual would endanger an SAR operation and thus increasing it's risk. Our concern was also shared by Cokorilo where she had raised the issue of risk in her paper. She indicated that there ought to be a statistical assessment upon the SAR operations in order to gain a comprehensive risk evaluation [11]. Cokorilo had developed a method to predict the inherent

risk of SAR operations and our research was somehow guided by it.

Likert Scale had shown prominent in the academic world where numerous researchers had used the scale for various and numerous studies and researches. Ferrari had utilized the scale to study procrastination among college students [12]. He had developed several statements and questions and had integrated the Likert Scale to those statements and questions where the students had chosen the appropriate answers from the scale [12]. We had followed suit and our approach was similar.

Albaum had also utilized college students in his research but his study was upon the Likert Scale itself. Albaum had analyzed the appropriate usage of the scale and he deduced that the usage was appropriate for most situations and the scale was able to represent the perception of the intended subjects in an optimum manner [13].

Jauch had measured the professional commitment of academicians by using the Likert Scale and the usage of the scale had allowed him to comprehend the correlation between performance and commitment [14]. This showed that the Likert Scale is robust and the variety of usage of the scale is noticeable where the scale is acceptable among social scientists and researchers.

III. METHODOLOGY

The methodology of our research is shown in Figure 1.

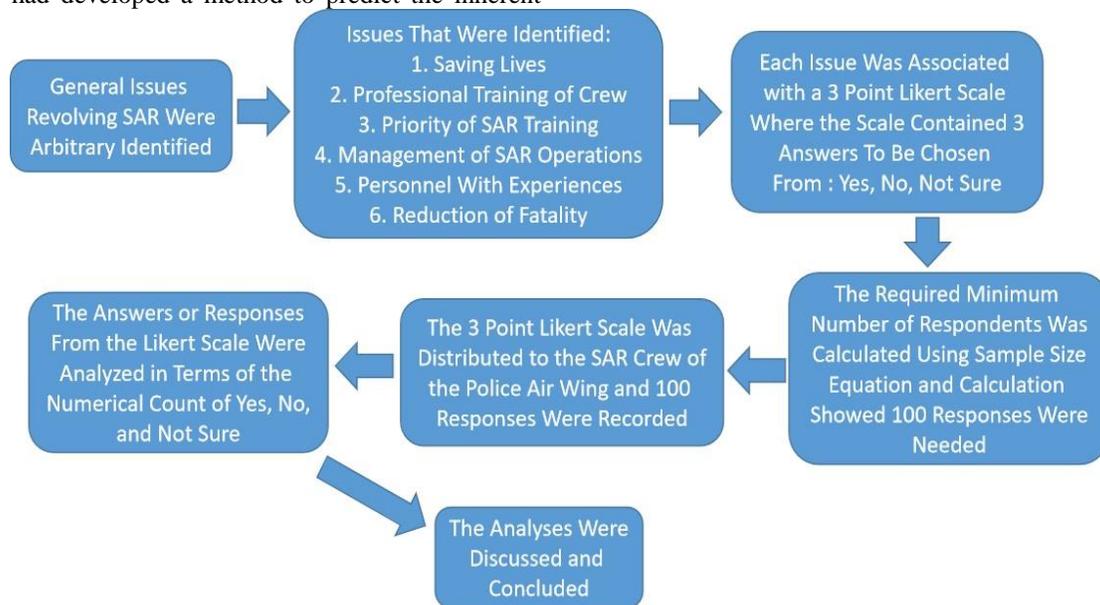


Figure 1. The Methodology to Obtain the Perception of the Crew

The general issues pertaining to SAR were arbitrary identified where the decision was based upon heuristics. We had listed 5 issues that were posed to the respondents. Those 5 issues were Saving Lives, Professional Training of Crew, Priority of SAR Training, Management of SAR Operations, Personnel with Experiences, and Reduction of Fatality. Some of these issues were somehow related to human physical fitness and risk where

we had earlier outlined the correlation in the Literature Review section.

Each of these issues were associated with a 3 Point Likert Scale where the respondents were given choices for their answers. Those choices were Yes, No, and Not Sure. We had calculated the required minimum number of respondents by using the Sample Size Equation. We had inserted these values

into the equation : Population Size = 253 , Confidence Level = 80% , and Margin of Error = 5% . The population size is the total number of individuals from the Malaysian Police Air Wing that were involved in SAR.

The calculation showed that we need a minimum of 100 respondents. The issues along with the Likert Scale were then

distributed to the crew of SAR and we had obtained 100 responses which thus met our minimum requirement. The responses were then analyzed where the number of Yes, No, and Not Sure was quantified, counted and represented in graphical forms. These were then discussed and conclusions were made.

IV. RESULTS

Figures 2, 3, 4, 5, 6, and 7 show the results in graphical form.

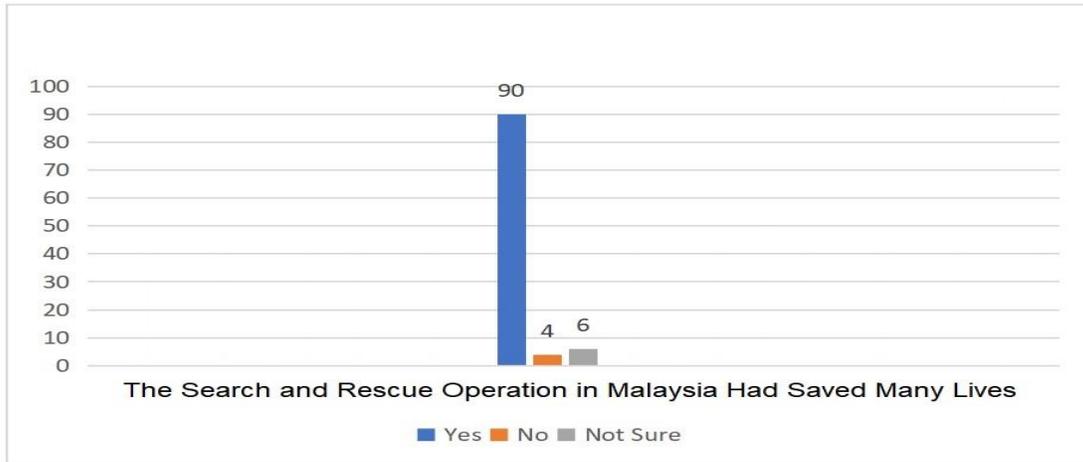


Figure 2. Saving Lives

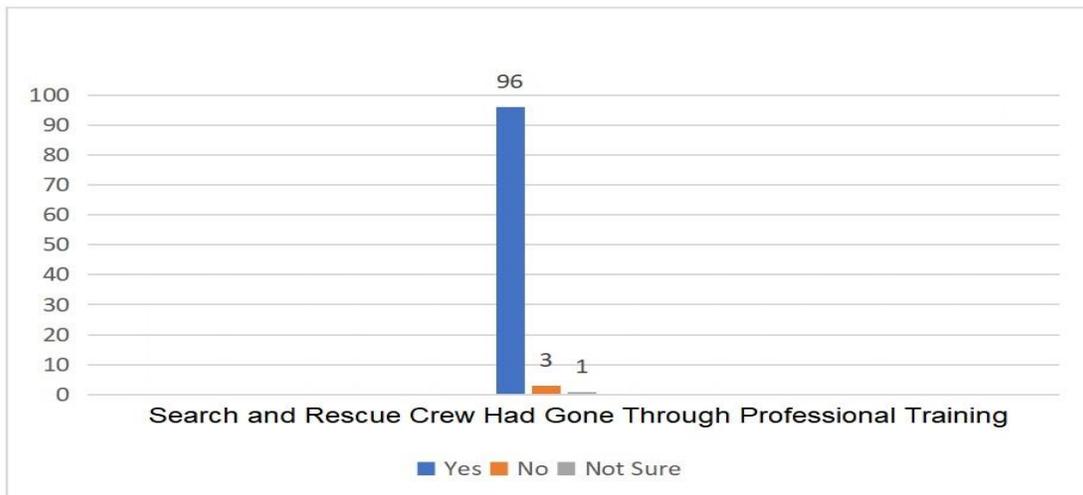


Figure 3. Professional Training

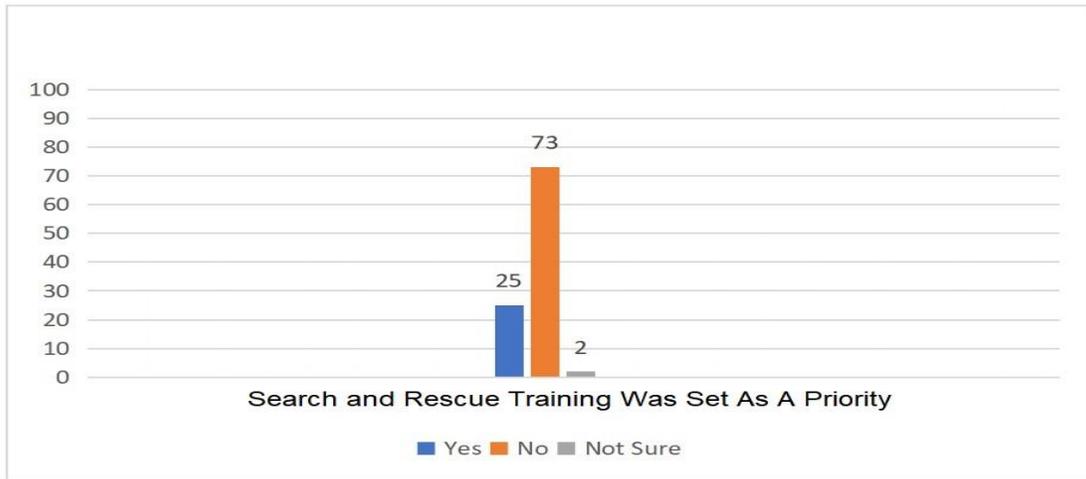


Figure 4. Priority of SAR Training



Figure 5. Management of SAR Operations

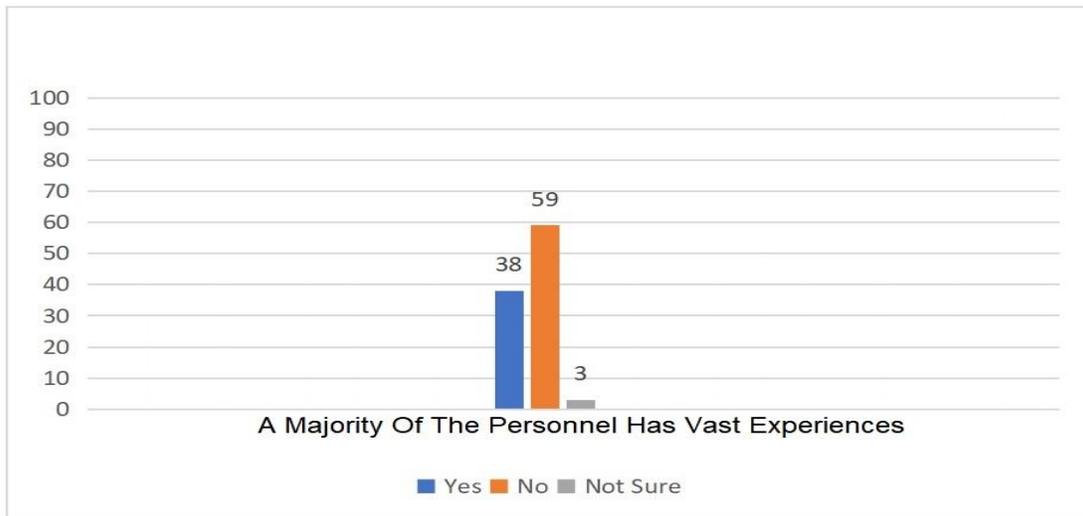


Figure 6. Personnel with Experiences

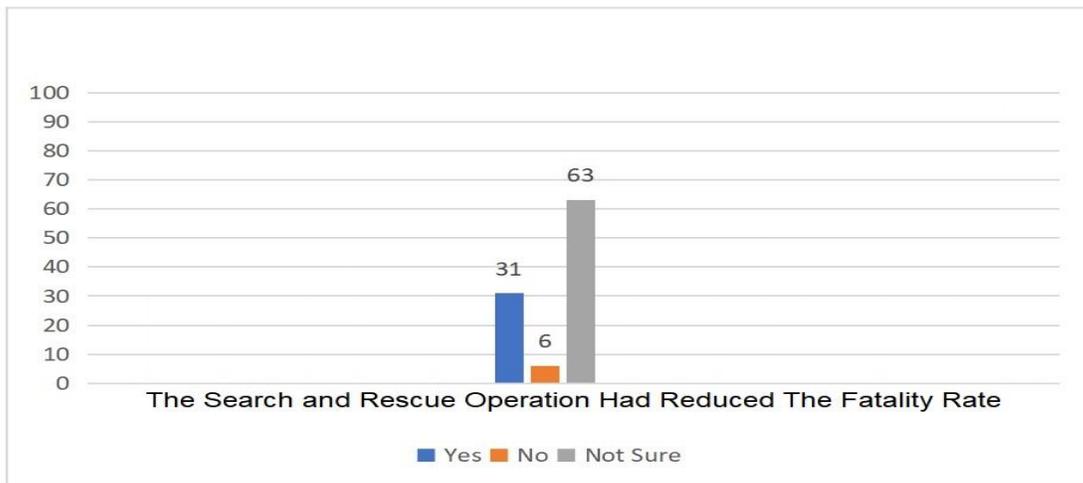


Figure 7. Reduction of Fatality

V. DISCUSSION

From Figure 2, it can be seen that 90 individuals from the SAR crew had agreed that the SAR operations in Malaysia had saved numerous lives. This number represents 90% of the total respondents. We were clearly delighted that a majority of the crew felt that they had contributed to the life saving process and perhaps their perceptions were based upon operational experiences where various lives were indeed saved.

Figure 3 showed the issue concerning professional training. Professional training here encompassed training in several fields such as physical fitness, methodology of SAR, management of SAR, maintenance of equipment, resources planning, and more. Only 3% of the respondents perceived the crew had not gone through adequate professional training while 96% perceived otherwise. We can take note that almost all of the respondents had undergone, in some way, sufficient amount of training pursuant to SAR.

Based upon Figure 4, it seems that 73% of the respondents felt that the SAR training was not set as a priority by certain quarters. This is quite alarming and perhaps most of the training were focused upon certain non SAR entities. This issue requires more investigation in order to unearth the real picture of the situation. There is a possibility that the allocation of training was actuated in stages and there were groups of individuals that had not gone through several training as the waiting list was extensive.

Figure 5 indicated that 97% of the respondents agreed to the notion of improving the management of SAR operations. Not all operations went smoothly as indicated by the literature in the Literature Review Section. In fact, we had pointed out in the Literature Review Section that this was a global predicament, not only constricted in Malaysia. The perceptions of our respondents showed that they were willing to improve themselves and learn from their previous operations. This is a good trait and should be applauded.

By looking at Figure 6, only 38% of the respondents acknowledged that a majority of the crew members had extensive experiences. This could be an indication that most of the individuals in the SAR crew were young and had not matured yet. While this number (38%) may be low, we felt that there was progression in the team where young individuals were roped in and were led by members who were much more experienced. Young individuals were much more fitter and employing this strategy is reasonable as most SAR tasks were arduous and gruesome.

In Figure 7, 63% of the respondents were unsure whether the SAR operations had reduced the fatality level during incidents or catastrophes. It might be because the crew were responsible for the SAR portion only and victims that were saved were subsequently passed to other agencies for treatment and care. Thus this explain the crew's ignorance upon the status of the saved victims.

VI. CONCLUSIONS

The result that we obtained showed that the SAR crew were seemingly critical of the issues that existed in the SAR operations and structure. However a majority perceived and felt that the professional training they received were adequate and sufficient. High portion of the crew stated that there should be improvement with regards to the management of SAR operations. A majority of the crew also stipulated that SAR training should be given uttermost priority. However the SAR crew also indicated that their profession had saved precious lives and had made a significant impact during unwanted events.

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