Human Negligence Play the Largest Contributing Factor of Airplane Accidents

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Abstract: ***The main objective of this research is to evaluate the impact of human negligence on airplane accident. Another objective is to minimize the percentage contribution of human negligence on airplane accident. This research is being conducted due to the airplane crash that have many related to this topic. Although there are many other factors that related to the crash, but this factor of the topic contributes at almost of the accident occur. From the evaluation that been made from this research, the factors that related to this topic can determined. With the evaluation it can tend to minimize the factors that can contribute to fatal accident. This research been conducted at Galaxy Aerospace (M) Sdn Bhd at Subang branch to determine and actually evaluate the actual causes that these factors contribute to fatal accident. The outcome of this research hopefully can minimize the aircraft fatal not only to these factors but all the factors that are related to it as we want the aircraft industry are the safest transportation in the world.***

Keywords: Human negligence, airplane accidents, aircraft maintenance technicians, SPSS

I. INTRODUCTION

Overview

Accident and incident in every field will never been inescapable. Exactly everyday will be an accident either is it the land, sea, and also air. This matter can lead to many things include damage of things, damage to the human body such as fractures of bones and loss of limbs, loss of profit to company and the worst thing is, loss of live or death. Many factors play a major role to this accidents and incident happened especially the attitude of human factors itself which is human negligence and human inconsistencies. For example, due to the human negligence during work, a sessions court in Shah Alam on April 8 2016 have ordered a private hospital which had been sued to pay RM165,375.81 to a woman [1]. This shows that even a slightly negligence and inconsistencies when working can cause serious damaged not only to the person but also to the company itself.

Statement of Problem

Airplane accident occurs in worldwide comes in many factors. Human negligence plays one of the major factors and it cannot be contained. This became worldwide problem and need to minimize faster. In aviation field, human negligence can be related to engineers and maintenance crew and also slightly on pilot.

The reasons of this research being conduct is to evaluate the impact of human negligence on airplane accident. Besides, the research is to minimize the percentage contribution of human negligence on airplane accident.

Objectives

Human negligence contributes largest factor of airplane accident even since the industry been founded. More airplane accident can occur every year if this factor not been reduced. This research is conducted to achieve the listed objectives:

- To evaluate the impact of human negligence on airplane accident.
- To minimize the percentage contribution of human negligence on airplane accident.

Scope and Limitation

The research is conducted in Aircraft Maintenance Company. Due to the topic is not focusing on any organization or personnel, the questionnaire is on general knowledge on how human negligence can affects in airplane accidents. Thus, it will not consist privacy of any organization and personnel but only questionnaire on general knowledge about how human negligence.

II. LITERATURE REVIEW

According to article "The Presence of Behavioral Traps in U.S. Airline Accidents: A Qualitative Analysis by Jonathan Velazquez" that been published on 11 January 2018 recently, the behavior of neglect the planning of flight is the highest on behavior traps found and seconds highest in behavior traps found on fatal accident only [2].

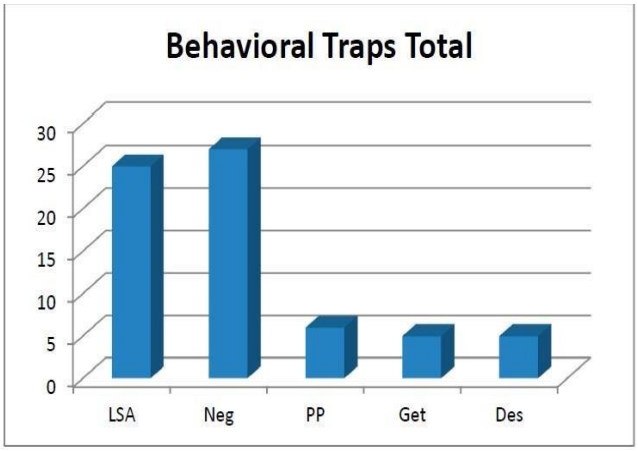

Fig. 1 Frequency count of all behavioral traps found [2]

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Where,
LSA = Loss of Situational Awareness,
Neg = Neglect of Flight Planning, Preflight Inspections, and Checklists,
PP = Peer Pressure,
Get = Get-There-Itis,
Des = Unauthorized Descent Below an IFR Altitude

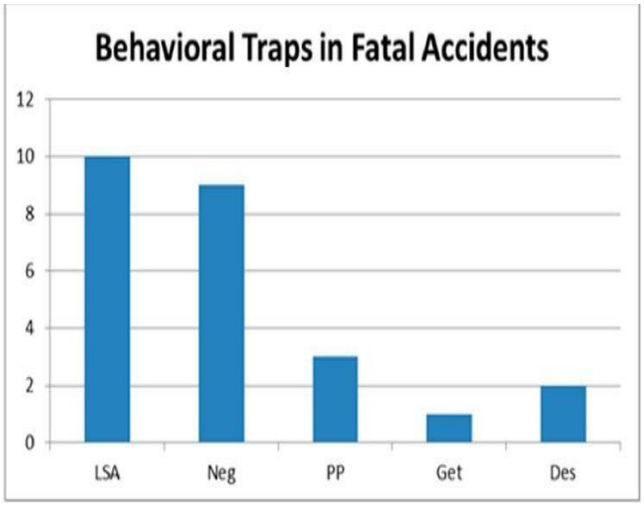

Fig. 2 Behavior Traps in Fatal Accident Only [2]

This shows that even a slightly negligence happens in aircraft industry can be fatal to the aircraft an also the airlines. According to Eric E. Murphy, with the article of "Federal Pre-emption of State Law Relating to an Air Carrier's Services" says that "a passenger could sue in state court for injuries caused by falling luggage or flight attendants in their provision of services." This shown that, passengers have right to sue the airlines if they found that negligence and inconsistency happened before or during the flight that causes the accident happening [3].

Other than that, the airlines also can loss their profit due to the previous accident and incident that can be related to the negligence and inconsistency in their work. They can loss their profit because passengers will choose other airlines that have good record of flying and lesser accident happened on that airlines and not choosing the airlines that cannot handle this matter from happening widely.

According to the Paul Stephen Dempsey on his article "Accidents & Injuries in Air Law: The Clash of the Titans" says about the negligence, "to avoid limitless liability out of all proportion to the degree of a defendant's negligence . . . the right to recover for negligently caused emotional distress must be limited." Hence, the negligence on work can be worst to the airlines because it can make the airlines losses their capability and trustworthiness from the passengers thus make the airlines losses their profit [4]. Thus, the airlines need to come with some sort of idea to minimize the negligence in their workers and implement it so that it can help to growth the airline worldwide.

This view can lead to conflicts with legal systems that are intended to establish liability and blame. In many jurisdictions, it is impossible to distribute responsibility in a piecemeal fashion across many different individuals who together, play a small role in forming the context in which an accident can occur.

III. METHODOLOGY

A set of questionnaires containing a few questions that divided to four section which is Section A, Section B, Section C and Section D.

Section A consist of personal detail of maintenance personnel that include the age, gender, education level and experience.

Section B concentrate on maintenance personnel knowledge that concerning human negligence. This section gives picture on what kind of error that leads to human negligence and the effect if human negligence is detected.

Section C focusing on the effect of human negligence. The upcoming result from this section could be used to raise the awareness of safety and minimize the error that could be bring catastrophic accident in aviation.

Section D will focus on how to minimize the human negligence that could lead to disaster in aviation field. The result can be used to improve the awareness in maintenance line.

The data from questionnaire result will insert to the spreadsheet and will be sort by group. The result than will be stimulate by using Reliability test and can be determine if it is reliable or not. For this research, the 0.7 are the minimum requirement to make this research is reliable. Then the results will be shown on the statistic and graph.

IV. ANALYSIS

The questionnaires are mainly answered with ratings. Those ratings are the point of the objectives, to gain more understanding about this survey towards the students who will go into the aviation industry.

Reliability Analysis

This survey has been done to 21 respondents from Galaxy Aerospace (M) Sdn Bhd. This survey was intended to identify the knowledge of negligence in aviation maintenance. Other than that, this research also conducted to raise awareness of negligence effect when doing maintenance.

The results have been tested by doing reliability test on SPSS software. This to show if the results are following the standard of reliability. The minimum requirement of this test is 0.7.

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
0.766	0.755	22

Fig. 3 Reliability Statistics

Section B: Knowledge in Maintenance

1. Mistake can occur without proper instruction

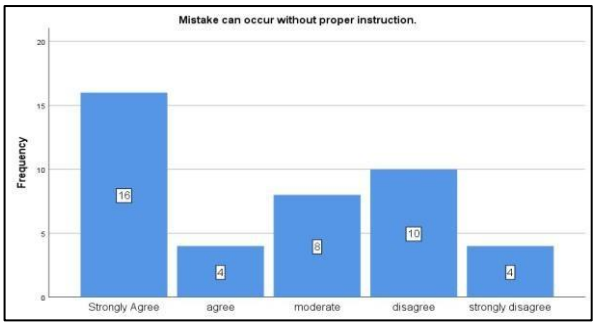

Fig. 4 Q1

Figure 4 shows the results for question 1, mistake can occur without proper instruction. Mostly the respondent's answer Strongly Agree with 16 out of 42 respondents (38.1%). The second highest is Disagree column with 10 out of 42 respondents (23.8%) answer it. The Moderate column comes third with 8 out of 42 respondents (19%) and following with Agree and Strongly Disagree that are comes last with 4 out of 42 respondents (9.5%) each. This shows that many respondents say that mistake may be occur without proper instruction given.

2. Simple decision-making need group discussion

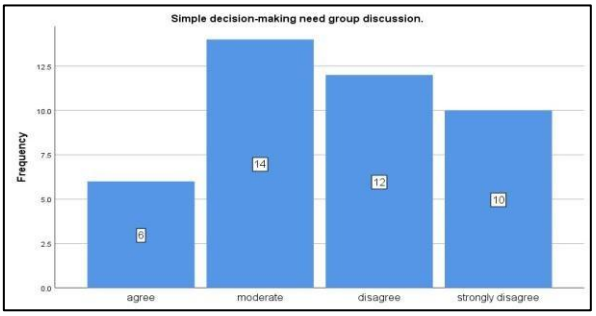

Fig. 5 Q2

Figure 5 show the results of question 2, simple decision-making need group discussion. The respondent's answer is mostly on Moderate category with 14 out of 42 respondents (33.3%). Disagree category comes on second with 12 out of 42 respondents (28.6%) and following Strongly Disagree with 10 out of 42 respondents (23.8%). The forth one goes to Agree category with 6 out of 42 respondents (14.3%) and Strongly Agree comes last with no respondents answer it. Figure 23 shown that many respondents say that simple decision-making not needed for group discussion.

3. Current practice to complete 2 -3 or more task at the same time

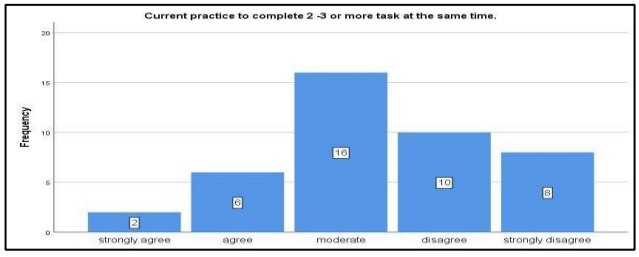

Fig. 6 Q3

Figure 6 shows the results for question 3, current practice to complete 2-3 or more task at the same time. The respondent's answers are most common in Moderate column with 16 out of 42 respondents (38.1%) answer it. Second highest with 10 out of 42 respondents (23.8%) is Disagree, and follow by Strongly Disagree with about 8 out 42 respondents (19%) answer it. The fourth highest are Agree with 6 out of 42 respondents (14.3%) answer it, and lastly are Strongly Agree with 2 out of 42 respondents answer it (4.8%). Hence, many respondents are not doing 2-3 or more task at the same time.

4. Always ask others to do the job without follow up

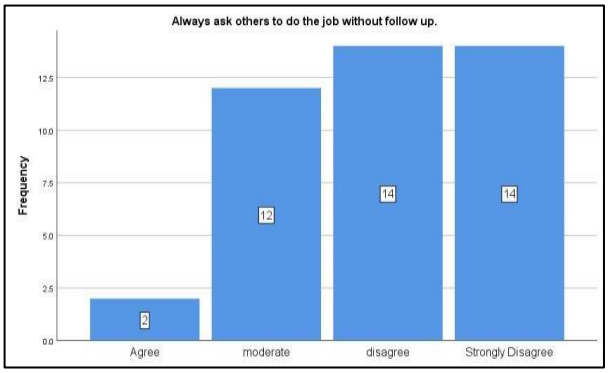

Fig. 7 Q4

Figure 7 shows the results for question 4, always ask other to do the job without follow up. The respondent's answer is most common in Disagree and Strongly Disagree column with 14 out of 42 respondents (33.3%) each choosing the answer. Third highest are Moderate with 12 out of 42 respondents (28.6%) followed by 2 respondents (4.8%) in Agree. Strongly Agree got no respondent choosing the answer. This shown that many respondents will always follows up the job that has been given to others.

5. I always think about my personal matters at work

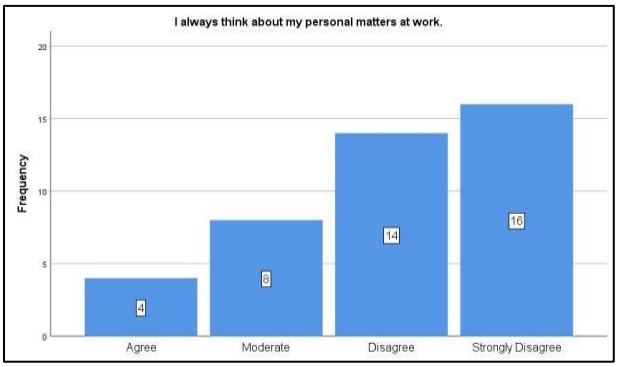

Fig. 8 Q5

Figure 8 shows the results for question 5, I always think about my personal matters at work. The respondent's answer is most common in Strongly Disagree column with 16 out of 42 respondents (38.1%) choosing the answer.

The second highest is Disagree with 14 respondents (33.3%) followed by 8 respondents (19%) in Moderate and Agree with 4 respondents (9.5%). Meanwhile, Strongly Agree got no respondent choose the answer. Figure 26 shown that most of the respondents are very professional as they are not thinking of their personal matters at work.

6. Always feel sleepy at work

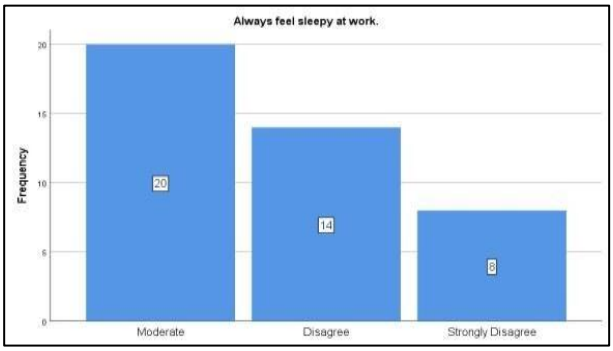

Fig. 9 Q6

Figure 9 shows the results for question 6, always feel sleepy at work. The respondent's answer is most common in Moderate column with 20 out of 42 respondents (47.6%) choosing the answer. Second highest is on Disagree column with 14 respondents (33.3%), followed by Strongly Disagree with 8 respondents (19%). Meanwhile, Strongly Agree and Agree columns get no respondent choosing the answer. This shows that the respondents not always feel sleepy at work and very prepared themselves before start doing their job.

Table. 1 Mean of Section B

	Q1	Q2	Q3	Q4	Q5	Q6
Mean	2.5714	3.6190	3.3810	3.9524	4.0000	3.7143

From the table above, it can conclude that question 1 got the lowest mean compared to the other questions. The question is "Mistake can occur without proper instruction". Hence, most of the employee have average personal knowledge regarding on the relationship of instruction from the leader to the teammates or vice versa because they do not aware that without proper instruction especially while doing the maintenance work, accident can occur either sooner or later.

Section C: Negligence in Maintenance

7. Overload of tasks lead to negligence

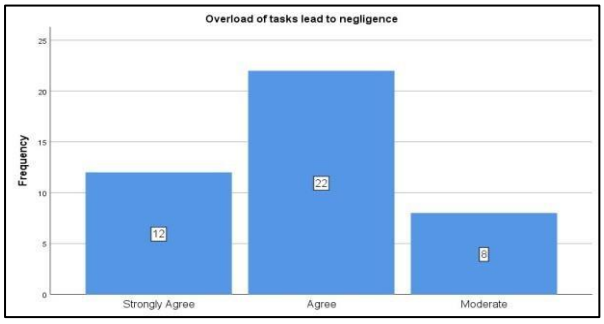

Fig. 10 Q7

Figure 10 shows the results for question 7, overload of tasks leads to negligence. The respondent's answers are most common in Agree column with 22 out of 42 respondents (52.4%) each choosing the answer. Then, it followed by Strongly Agree with 12 respondents (28.6%) and Moderate with 8 respondents (19%). Meanwhile, Disagree and Strongly Disagree got no respondent choosing it. Most of the respondent agreed that overload of tasks will lead to negligence happens.

8. Carelessness while handle of the aircraft can be accepted

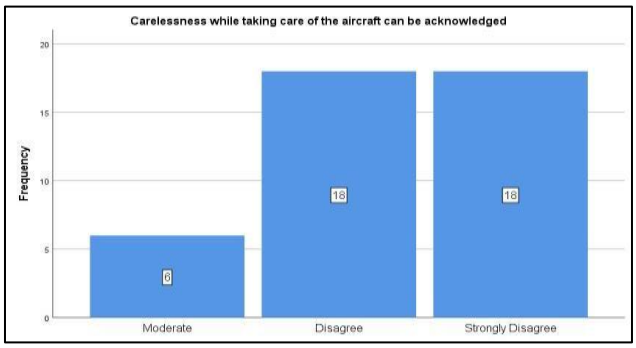

Fig. 11 Q8

Figure 11 shows the results for question 8, carelessness while handle of the aircraft can be accepted. The respondent's answers are common in Disagree and Strongly Disagree with 18 out of 42 respondents (42.9%) each choosing the answer. Then, it followed by 6 respondents (14.3%) in Moderate column, and Agree and Strongly Disagree get no respondent choosing the answer. This shown that carelessness is not accepted especially while handling the aircraft.

9. Overconfidence causes negligence

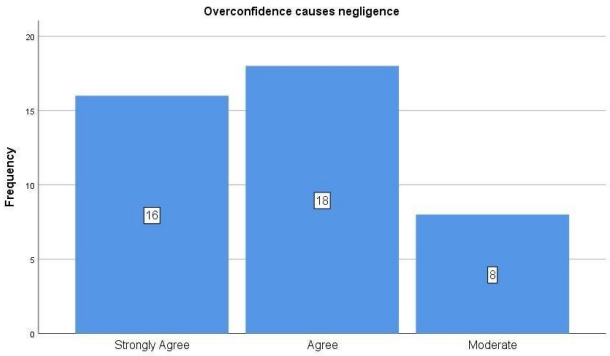

Fig. 12 Q9

Figure 12 shows the results for question 9, overconfidence causes negligence. The respondent's answer is most common on Agree with 18 out of 42 respondents (42.9%) choosing the answer. Second highest is Strongly Agree with 16 out of 42 respondents (38.1%), followed by Moderate with 8 respondents (19%). Lastly, Disagree and Strongly Disagree got no respondent choosing the answer. Hence, overconfidence while doing work can cause negligence to happen.

10. Skipping steps from the manual should be possible

Fig. 13 Q10

Figure 31 shows the results for question 10, skipping steps from the manual should be possible. The respondent's answer is most common in Strongly Disagree with 26 out of 42 respondents (61.9%) choosing the answer. The second highest is Disagree with 16 respondents (38.1%). Meanwhile, Moderate, Agree and Strongly Agree got no respondents choosing the answer. Figure 31 shows that skipping steps from the manual is cannot been done especially while doing the maintenance process.

11. Doing work when excessively hot can influence work performance

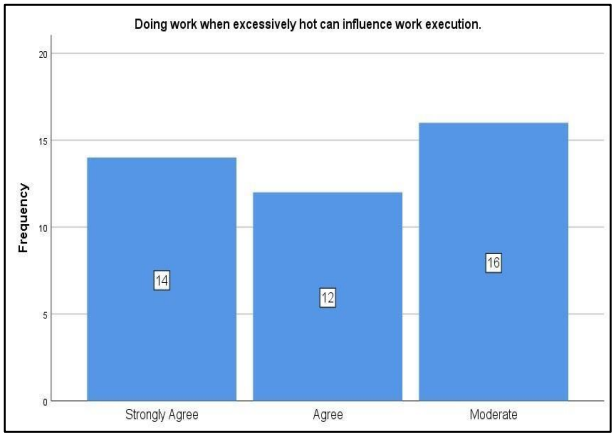

Fig. 14 Q11

Figure 14 shows the results for question 11, doing work when excessively hot can influence work performance. The respondent's answer is most common in Moderate column with 16 out of 42 respondents (38.1%) choosing the answer. Second highest are Strongly Agree column with 14 respondents (33.3%), followed by Agree with 12 respondents (28.6%) choosing the answer. Meanwhile, Disagree and Strongly Disagree get no respondents choosing the answer. This shows that when doing work at excessively hot condition can influence the work performance especially while handling the aircraft.

12. In emergency situation, neglect some procedure is accepted

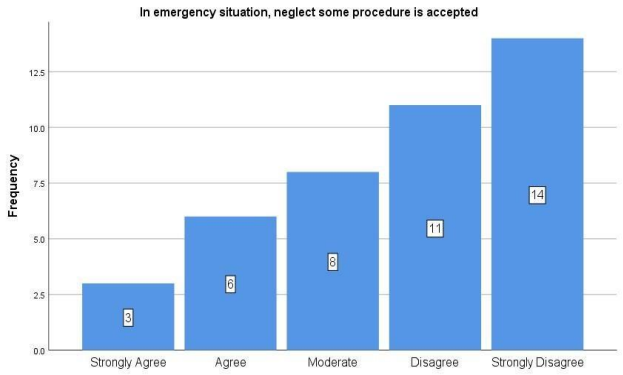

Fig. 15 Q12

Figure 15 shows the results for question 12, in emergency situation, neglect some procedure is accepted. The respondent's answer is most common in Strongly Disagree with 14 respondents out of 42 (33.3%) choosing the answer. Second highest are Disagree column with 11 respondents (26.2%) followed by 8 respondents (19%) in Moderate and 6 respondents (14.3%) in Agree. Meanwhile, Strongly Agree column get the lowest respondents choosing it with 3 respondents (7.1%). This figure can conclude that even in emergency situation, negligence cannot be done especially on maintenance procedure.

Table. 2 Mean of Section C

	Q7	Q8	Q9	Q10	Q11	Q12
Mean	1.9048	4.2857	1.8095	4.6190	2.0476	3.4762

From the data tabulated above, the lowest mean for this section is on question 9 "Overconfidence causes negligence". Obviously, some respondents are not aware that actually overconfidence can influence the work results as the work is related with human life. Once the employee overconfidence in doing their work, they will mostly not recheck their work. Hence, if there is some mistakes, it cannot been detected and accident will happen.

Section D: Preventing of Negligence

13. Explain clearly work progress when doing shift changing

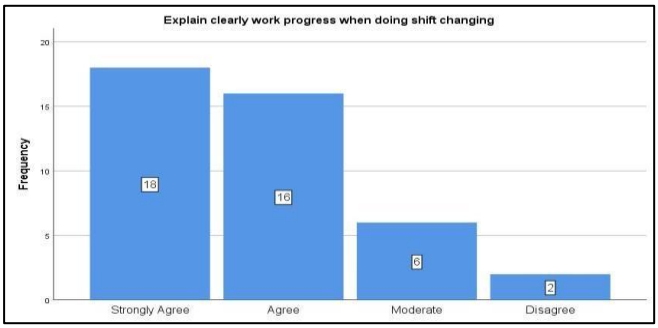

Fig. 16 Q13

Figure 16 shows the results for question 13, explain clearly work progress when doing shift changing. The respondent's answer is most common in Strongly Agree column with 18 out of 42 respondents (42.9%) choosing the answer. Second highest is Agree with 16 out of 42 respondents (38.1%), followed by Moderate with 6 respondents (14.3%) and 2 respondents (4.8%) on Disagree. Strong Disagree gets no respondent choosing the answer. This shows that many respondents say by clearly explain work progress while doing shift changing can prevent negligence from happening.

14. Punishment need to be given if neglecting is happening

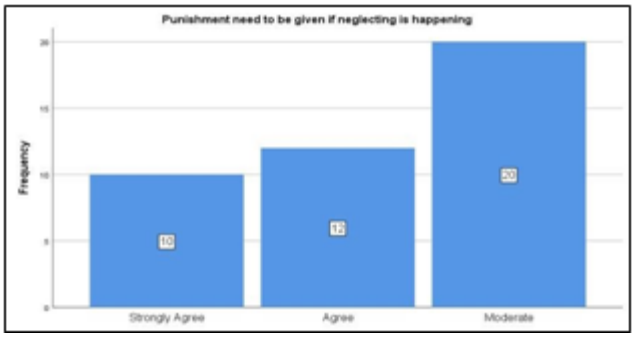

Fig. 17 Q14

Figure 14 shows the results for question 14, punishment need to be given if neglecting is happening. The respondent's answers are most common in Moderate with 20 out of 42 respondents (47.6%) choosing the answer. Second highest is Agree with 12 respondents (28.6%) and followed by 10 respondents (23.8%) in Strongly Agree. For Disagree and Strongly Disagree, both get no respondents choosing the answer. Most of respondents suggested punishment to be given for the personnel that neglecting while doing their job.

15. Double checking of technician work

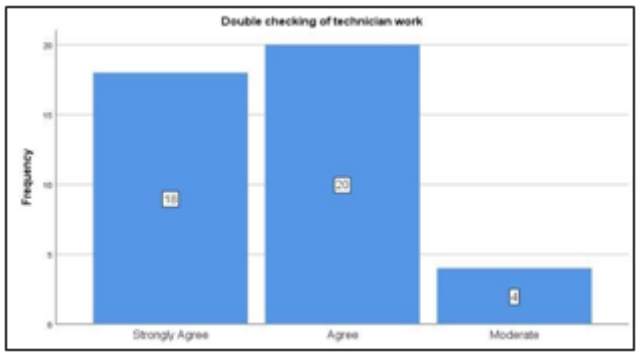

Fig. 18 Q15

Figure 18 shows the result for question 15, double checking of technician work. The respondent's answers are most common in Agree column with 20 out of 42 respondents (47.6%) choosing the answer. Second highest is Strongly Agree with 18 respondents (42.9%) and followed by Moderate with 4 respondents (9.5%). For Disagree and Strongly Disagree, both get no respondents choosing the answer. This shows that, respondents are agree as the double checking the technician works can prevent neglecting to happens.

16. Article related to aircraft accident due to negligence need to be display

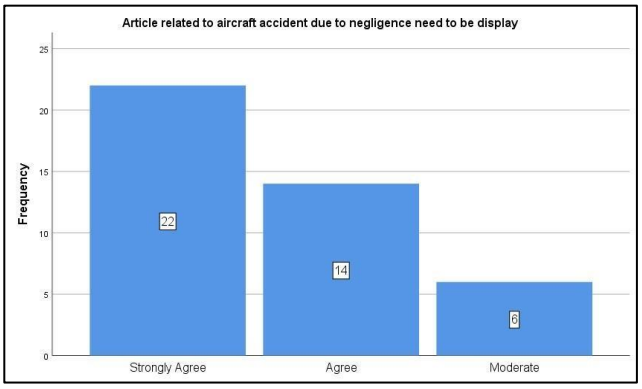

Fig. 19 Q16

Figure 19 shows the results for question 16, article related to aircraft accident due to negligence need to be display. The respondent's answers are most common in Strongly Agree with 22 out of 42 respondents (52.4%) choosing the answer. Second highest is Agree with 14 respondents (33.3%) and followed by Moderate with 16 respondents (14.3%) choosing the answer. For Disagree and Strongly Disagree get no respondent choosing the answer. This shows that many respondents agree that by displaying article related to aircraft accidents due to negligence can help to prevent negligence to happening while doing work.

17. Mark the unfinished work before go to rest or changing the shift

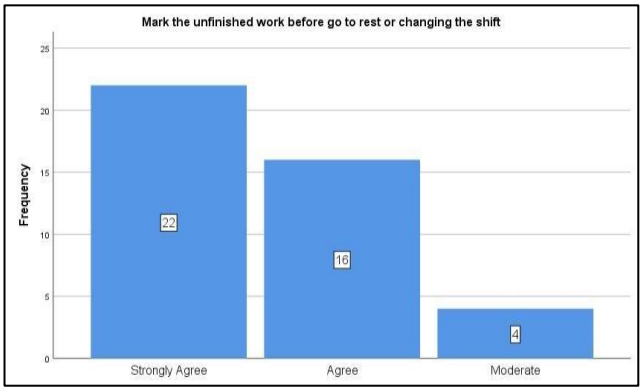

Fig. 20 Q17

Figure 20 shows the results for question 17, mark the unfinished work before go to rest or changing the shift. The respondent's answers are most common in Strongly Agree column with 22 out of 42 respondents (52.4%) choosing the answer. Second highest is Agree with 16 respondents (38.1%) and followed by 4 respondents (9.5%) in Moderate column. For Disagree and Strongly Disagree get no respondent choosing the answer. Figure 38 shows that the respondents strongly agree that the personnel need to mark the unfinished work before leaving the work station as it can help preventing negligence while doing work.

18. Work must be complete on time.

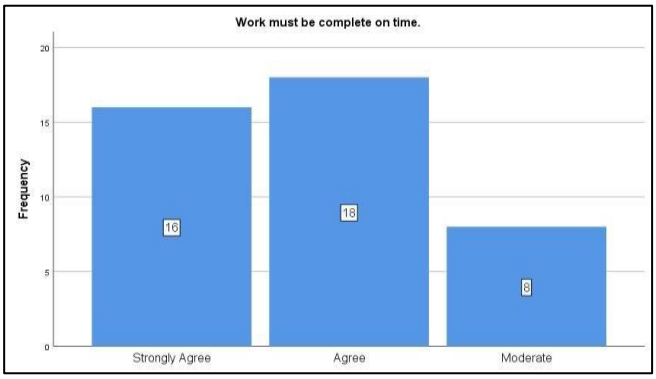

Fig. 21 Q18

Figure 21 shows the answer for question 18, work must be complete on time. The respondent's answer most common in Agree column with 18 out of 42 respondents (42.9%) choosing the answer. Second highest is Strongly Agree with 16 respondents (38.1%) and followed by 8 respondents (19%) choosing Moderate column as their answer. For Disagree and Strongly Disagree get no respondent choosing the answer. The last question that been asked in the survey shows that by doing the work and complete it on time can prevent negligence from happening.

Table. 3 Mean of Section D

	Q7	Q8	Q9	Q10	Q11	Q12
Mean	1.9048	4.2857	1.8095	4.6190	2.0476	3.4762

Table above shows the lowest mean is on question 17 "Mark the unfinished work before go to rest or changing the shift". From here, the employee itself did not aware that when the unfinished work is marked before their leaving the work station, it can prevent from negligence while doing work from happening. Besides, they just take it easy and lazy to mark as it will make them do more job before and after coming to work station. Hence, if the procedure before their leaving the work station is not mark able, chances to skip the next procedure is higher.

V. CONCLUSION

The findings of negligence while doing work can be used for employer, employee and also students as it can help to improve knowledge on negligence itself by knowing the impact of human negligence on airplane accidents. This also can be used to help minimizing the percentage contribution of human negligence that can contribute to airplane crash as the information can benefits the reader and prevent negligence from happening.

The first objective of this study wanted to achieve is to evaluate the impact of human negligence on airplane accident. This research can only able to evaluate the impact but it cannot give feedback to the respondent as there is not wrong or right answer. As to improve the quality of the research, the researcher can give feedback to the respondent by using pamphlet as the medium. This will help them more understand the information in the questionnaires.

The second objective of this study wanted to achieve is to minimize the percentage contribution of human negligence on airplane accident. This study can help many institutions to try minimizing the percentage of human negligence which that can contribute on airplane accident. By means to help them, the researcher can cooperate with any Approved Maintenance Organization (AMO) and Approved Training Organization (ATO) to make talk on negligence for further understanding. While having the event, second survey session can be done. With this, it can help them to increase the awareness about dangerously negligence can be. Further awareness studies must be carried out within smaller divisions of aviation companies to get more accurate and specific data, which in turn can benefit the work and progress that those divisions are thriving on. They include the recent studies which have been done in certain specializations like enhancing one's working skills [5-14], services [15-27] and technology [28-34]. Together, these concentrated efforts will not only improvise safety and save lives, but also important for business opportunities and healthy competitions in the future.

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