



Identification of Psychological Conditions and Feelings of Fatigue Among Employees at Makassar Air Traffic Service Center

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ABSTRACT

Air Traffic Control (ATC) remains an active field of work during the pandemic due to the demand from domestic and international travelers. It is crucial for controllers to prioritize both their mental health while on duty and their body's immunity against conditions that make them vulnerable to Covid-19. Therefore, this study aims to review psychological conditions, feelings of fatigue, and quality of life among ATC during the pandemic. A cross-sectional descriptive design was used and the participants were 89 ATC in Makassar Air Traffic Service Center. The data collected included the general characteristics of ATC, DASS-21, KAUPK2, and (WHOQOL)-BREF. Data were collected from February to March 2022, then analysis was carried out using SPSS and Excel software. The results indicated the presence of negative emotional conditions among ATC even outside of their normal traffic control duties. Approximately 24% of ATC reported feelings of fatigue, while the quality of life exhibited a wide distribution of data, ranging from moderate to low. Therefore, it was concluded that the health status of ATC, even with regulations limiting the amount of traffic related to the pandemic period, still needs special attention to maintain performance.

INTRODUCTION

The Covid-19 pandemic has proven to be a terrifying force for the global society, not only due to its ability to damage lives and immunity but also to disrupt social life and the world economy.¹⁻⁵ The global aviation industry has also suffered significant losses.⁶⁻⁹ Indonesia at the beginning of 2022 faced a third wave of Covid-19 due to the Omicron variant.¹⁰ However, there is now a gradual improvement in aviation policies, driven by increased public awareness and Implementation of vaccination.

Airnav Indonesia as the organizer of flight navigation also experienced adaptation during the COVID-19 pandemic when aircraft movements remained relatively low or fail to fully recover.¹¹ However, there has been a slow increase in flight services in 2022, both domestically and internationally. Domestic flights increased by 14% compared to 2021, while international and cross-country flights experienced a significant rise of 70% compared to 2021 and 47% in 2020.¹²

Despite these developments, Air Traffic Control (ATC) continued to be frontline workers who interact with people in an environment highly susceptible to the transmission of the Covid-19 virus. Therefore, the risk of infection among workers, specifically those working in enclosed spaces, remains considerable. A study conducted by Russeng et al., (2021) before the pandemic found that 43.1% of ATC in air traffic controllers at Sultan Hasanuddin Airport experienced fatigue, and there is a significant relationship between workload and shift work with the onset of fatigue.¹³ Several studies also reported that ATC workload can have psychological effects, leading to decreased productivity and potential disruptions or hazards in flight operations.¹⁴⁻¹⁸

Optimal performance is crucial for ensuring flight safety, ultimately saving millions of passengers' lives every day. Therefore, this study aims to review concerns about psychological conditions, feelings of work fatigue, and quality of life for air traffic controllers (ATC), precisely during the third wave of Covid-19 attacks.

MATERIAL AND METHOD

This cross-sectional study was conducted by collecting data from Makassar Air Traffic Service

Center (MATSC), between February and March 2022. Sampling was carried out by using the probability method, culminating in the selection of 89 people at random. The data collected included characteristics of respondents, consisting of name, gender, education, age, years of service, and marital status of employees. This was achieved using a questionnaire through direct interviews with ATC. Data related to Depression, Anxiety, and Stress was obtained in line with (Lovibond, 1995).

Data related to feelings of work fatigue were obtained using the Questionnaire for the Measure of Work Fatigue (KAUPK2) consisting of 17 items. This instrument was prepared by Lientje Setyawati in 1994 and has been tested for its validity and reliability. It was used to measure the feeling of work fatigue as a subjective symptom experienced by ATC employees. Previously, this questionnaire had also been tested for validity and reliability among ATC employees of 30 people. The results showed that all question items were valid and reliable. Data related to the quality of life were obtained from the World Health Organization Quality of Life (WHOQOL)-BREF questionnaire compiled in 2004. Subsequently, analysis was performed using SPSS, and Excel software. This study obtained ethical approval from the Ethics Commission, Faculty of Public Health, Hasanuddin University, with protocol number 14222105002.

RESULTS

The majority or 70.79% of the respondents were male, while 93.26% were in the Diploma/Bachelor category, 75.28% were aged <34 years, the most years of service was >5 years at 67.4%, and 71.9% were married as shown in Table 1.

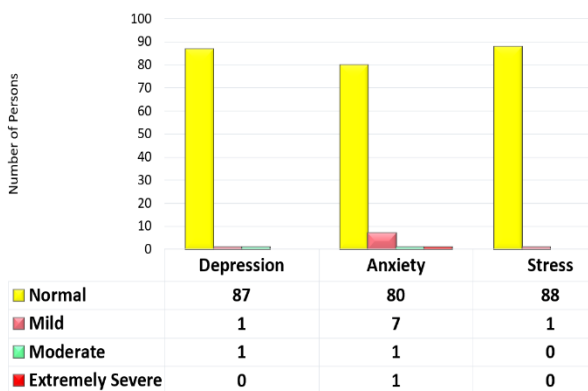
Based on Figure 1, the negative emotional conditions of the Makassar Branch AirNav controllers when measurements were taken during the pandemic varied significantly. A total of two controllers experienced depression at different levels, while for anxiety cases, there were nine controllers with 7, 1, and 1 in the mild, moderate, and extremely severe categories. Meanwhile, stress conditions were only experienced by one controller in the mild category.

As shown in Figure 2, the feeling of fatigue experienced by the controllers after discharging their duties were as follows; 18%, 4%, and 2% in the mild, moderate, and severe categories. Figure 3 shows that thirst, shoulders feeling stiff, pain in the back after work, and memory loss ranked highest among the feelings of fatigue.

Table 1. Characteristics of Respondents

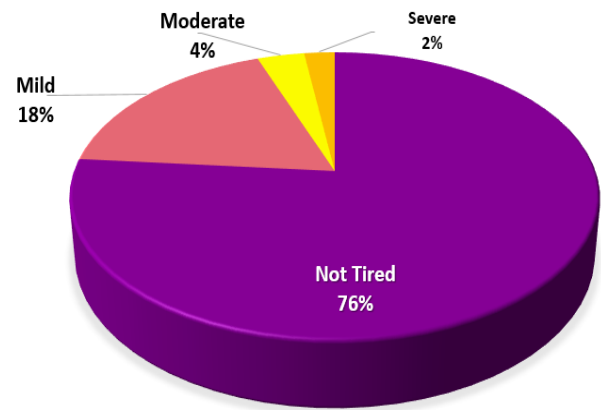
| Characteristics | n=89 | % |
|---------------------------|------|-------|
| Gender | | |
| Female | 26 | 29.21 |
| Male | 63 | 70.79 |
| Education | | |
| Magister Degree | 6 | 6.74 |
| Diploma/Bachelor's Degree | 83 | 93.26 |
| Age (Years) | | |
| < 34 | 67 | 75.28 |
| ≥ 34 | 22 | 24.72 |
| Years of Service | | |
| ≤ 5 Years | 29 | 32.58 |
| > 5 Years | 60 | 67.42 |
| Marital Status | | |
| Single | 21 | 23.60 |
| Widower/Widow | 4 | 4.49 |
| Married | 64 | 71.91 |

Source: Primary Data, 2020



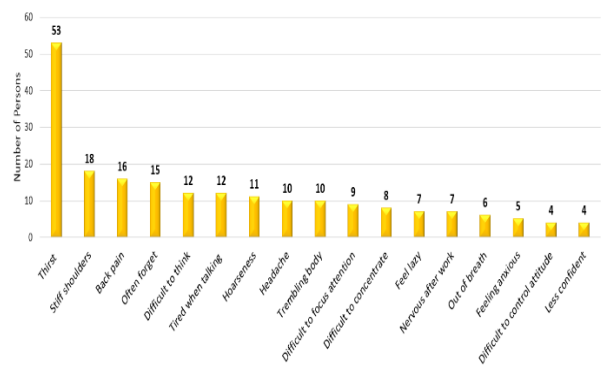
Source: Primary Data, 2020

Figure 1. Distribution of Emotional Status among Air Traffic Controllers during the Covid-19 Pandemic



Source: Primary Data, 2020

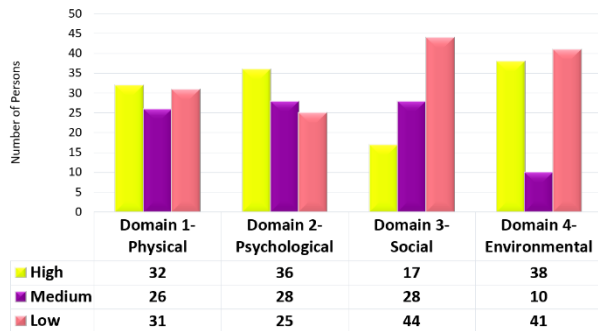
Figure 2. Distribution of Feelings of Fatigue Among Air Traffic Controllers During the Covid-19 Pandemic



Source: Primary Data, 2020

Figure 3. Details of Feelings of Fatigue Experienced Among Air Traffic Controllers During the Covid-19 Pandemic

Figure 4 shows the quality of life among ATC for different domains. In domain 1 (physical health), the good and low quality of life categories had almost the same value. In domain 2 (psychological health), the good quality of life category was less than 50% of the total controller sample. Meanwhile, in domains 3 (Social Relations) and 4 (Relations with Environment), the good quality of life category was more predominant.



Source: Primary Data, 2020

Figure 4. Distribution of Quality of Life Among Air Traffic Controllers During the Pandemic Covid-19 Pandemic

DISCUSSION

The results showed the presence of negative emotional conditions among ATC during the pandemic, despite the reduced traffic levels. Among the identified conditions, anxiety emerged as the most identified group among controllers compared to depression and stress. Fatigue was also reported, with some respondents falling in the severe category. Additionally, the results indicated the predominance of medium and low quality of life.

However, since the Covid 19 health emergency occurred, economic-social conditions have been in turmoil, including in the aviation industry, which has experienced a decline in services in an effort to reduce the number of cases of positive confirmed cases.^{19,20} The prediction that negative emotional conditions (stress, anxiety, and depression) at ATC will be nil due to the decreased traffic factor, has proven not to have occurred completely and 24% even experienced fatigue from the moderate to severe category. Work activities during the pandemic were relatively limited with the implementation of Work From Home (WFH), there were only several types of work that were directly active in the field, looking at research on workers who remained on duty during the Covid 19 period such as medical experts also proved there was an increase in anxiety while on duty especially if low resilience,²¹⁻²⁴ even with different professions, both professions are prone to experiencing anxiety its relation to mental load,^{25,26} so it requires adequate coping.

Even in a study Mrklas et al (2020) which wanted to assess the impact of COVID-19 on the mental health mitigation needs of health workers and other working professions, it was found that during the initial phase of the COVID-19 outbreak, mental health disorders increased, especially the prevalence of stress, but statistically significantly higher in other working professions than in the medical profession.²⁷ In addition to the workload factor, increased anxiety for workers during a pandemic is associated with living in the red-orange zone and a lack of resilience.²⁴

Edmund Jacobson asserted that tension arises due to a natural reaction to the shortening of muscle fibers resulting in anxiety.²⁸ This common condition of mental disorders affects nearly 30% of adults.²⁹ Although individual responses differ, stress is the main trigger for anxiety. The brain, influenced by stress hormones such as cortisol, may struggle to regulate negative emotions, leading to excessive negative thinking, difficulty concentrating, and memory bias.^{30,31} Simultaneously, the amygdala, which controls the emotions of the brain, becomes overactive and hinders mental tranquility.³²

Fatigue, a psychological disorder, and one of the biggest health problems in the world, is no exception in the industrial sector.³³ The anxiety response experienced by ATC arises from work stressors associated with air traffic control including fatigue. The working concept of ATC is to prevent collisions between aircraft and surrounding obstacles, with the expectation of error-free control decision-making.^{18,34-37} Moreover, the current pandemic adds further complexity to the mental health of ATC, as they face the threat of infection.³⁸⁻⁴¹ The findings regarding the low quality of life were consistent with previous studies highlighting that the stressful conditions experienced by ATC had a significant effect on feelings of fatigue and quality of life.⁴²

Through the results of research studies related to occupational safety and health principles, particularly observations of the potential for psychological disorders in air traffic controllers, even though the frequency of

air traffic control is low, it is hoped that this will make a positive scientific contribution. The aspiration is for aviation industry authorities, especially organizations handling the scope of air traffic control, to enhance preventive or coping efforts for risk factors that can disrupt performance. This includes the implementation of simple relaxation techniques after completing control activities.

The significant challenge in this research lies in the difficulty of establishing direct contact with respondents, especially when seeking deeper insights into perceived health problems. Some respondents had to be interviewed by telephone due to their health conditions. The anticipation is that future researchers will be better equipped to identify risk factors related to ATC psychological disorders and achieve accuracy in assessing psychological disorders levels and their relationships with risk factors by using standardized medical tools, along with ATC officer biomarker tests.

CONCLUSION AND RECOMMENDATION

In conclusion, ATC officers experienced negative emotional states including feelings of fatigue and moderate to low quality of life, even outside their normal air traffic control duties. This complexity was further amplified when pressure at work was combined with personal problems. The interplay between these factors poses a threat to the ability of workers to fulfill performance, manifesting in various ways including physical, mental, and emotional. Therefore, it is important to provide principles of disease control/prevention, such as practicing relaxation for each ATC as an early coping strategy in the emergence of psychological disorders' symptoms.

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AUTHOR CONTRIBUTIONS

LMS made substantial contributions to the study design up to the drafting of the article, SSR, performed a critical review with important intellectual contributions, specifically in the study of medicine, IT contributed substantially to a crucial review with essential scholarly contributions specifically in the study of psychology, IHY, and YR, made significant contributions to conception and design of work, analysis, and interpretation of data. In addition, NMS and MY contributed substantially to all aspects of the study and ensured that questions related to the accuracy or integrity of any part of the study are appropriately investigated and resolved.

CONFLICTS OF INTEREST

The authors declare that there are no significant competing financial, professional, or personal interests.

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