VISUALIZATION OF WORK STRESS AND WORKLOAD DATA ON NURSES AT MAKASSAR CITY HOSPITAL (A STUDY USING SALIVA BIOMARKER EXAMINATION APPROACH)

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ABSTRACT

Background: Health services are one of the duties and responsibilities of a nurse. Providing optimal service is a major contribution to patient recovery. The implementation of services performed by nurses is usually faced with various conditions that can trigger work stress. Work stress is one of the obstacles for nurses in providing health services. The emergence of work stress in nurses due to their work being in close contact with patients and other factors such as work location, various inpatient cases, labor shortages, forced overtime hours, and the attitude of the head of the ward can put pressure on nurses.

Objective: To determine the visualization of work stress and workload data on nurses at Makassar City Hospital using the approach of examining salivary biomarkers.

Research methods: This study uses a longitudinal study approach, namely conducting an analytical study that aims to follow the development of work stress events in nurses at Makassar City Hospital. The research will be carried out for 3 years, namely 2023 - 2025. The first year of this research, namely 2023, has started from August-September 2023. The research location was carried out in 2 (two) Makassar City Hospitals namely Labuang Baji Hospital and Daya General Hospital. The number of samples in this study was 100 people. The research instrument used was a questionnaire used to collect primary data related to the characteristics of the respondents and workload. The cocorometer tool is used to measure work stress through salivary biomarkers. This tool functions to measure stress levels based on α-amylase in the salivary glands. Data were analyzed using descriptive analysis using Microsoft Excel and SPSS 21.

Conclusion: Visualization of stress data found that respondents at Labuang Baji Hospital had 42 people who did not experience stress. Likewise, respondents at Daya General Hospital found 46 people who did not experience stress. This is in accordance with workload data for nurses in both hospitals. There were 16 people at Labuang Baji Hospital who stated their workload was light. It's the same with nurses who are at the Daya General Hospital. Most nurses stated that their workload was light, namely 27 people. It is hoped that nurses will continue to be able to control themselves (coping) against the working conditions they face, manage their time well, get enough rest, self-management to minimize the risk of stress. Another thing that is also important to apply is a healthy lifestyle and exercise. Hospital management is expected to properly implement policies and strategies related to stress and fatigue management in the workplace.

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Resumo

Contexto: Os serviços de saúde são uma das obrigações e responsabilidades de um enfermeiro. A prestação de um serviço ideal é uma grande contribuição para a recuperação do paciente. A implementação de serviços realizados por enfermeiros geralmente enfrenta várias condições que podem desencadear estresse no trabalho. O estresse no trabalho é um dos obstáculos para os enfermeiros prestarem serviços de saúde. A emergência de estresse no trabalho em enfermeiros devido ao seu trabalho estar em contato próximo com os pacientes e outros fatores, como local de trabalho, vários casos de internação, escassez de trabalho, horas extras forçadas e a atitude do chefe da enfermaria pode colocar pressão sobre os enfermeiros.

Objetivo: Determinar a visualização dos dados de estresse e carga de trabalho em enfermeiros no Hospital da Cidade de Makassar usando a abordagem de examinar biomarcadores salivares.

Métodos de pesquisa: Este estudo utiliza uma abordagem de estudo longitudinal, nomeadamente a realização de um estudo analítico que visa acompanhar o desenvolvimento de eventos de estresse no trabalho em enfermeiros no Hospital da Cidade de Makassar. A pesquisa será realizada por 3 anos, ou seja, 2023 - 2025. O primeiro ano desta pesquisa, ou seja, 2023, começou de agosto a setembro de 2023. O local de pesquisa foi realizado em 2 (dois) Hospitais da Cidade de Makassar, nomeadamente o Hospital Labuang Baji e o Hospital Geral Daya. O número de amostras neste estudo foi de 100 pessoas. O instrumento de pesquisa utilizado foi um questionário utilizado para coletar dados primários relacionados às características dos respondentes e carga de trabalho. A ferramenta de cocorometria é usada para medir o estresse no trabalho através de biomarcadores salivares. Esta ferramenta funciona para medir os níveis de estresse com base na α-amilase nas glândulas salivares. Os dados foram analisados por meio de análise descritiva utilizando o Microsoft Excel e o SPSS 21.

Conclusão: Visualização de dados de estresse constatou que os entrevistados no Hospital Labuang Baji tinham 42 pessoas que não experimentavam estresse. Da mesma forma, os entrevistados no Hospital Geral Daya encontraram 46 pessoas que não experimentaram estresse. Isso está de acordo com os dados de carga de trabalho para enfermeiros em ambos os hospitais. Havia 16 pessoas no Hospital Labuang Baji que declararam que sua carga de trabalho era leve. O mesmo acontece com enfermeiras que estão no Hospital Geral Daya. A maioria dos enfermeiros afirmou que sua carga de trabalho era leve, ou seja, 27 pessoas. Espera-se que os enfermeiros continuem a ser capazes de se controlar (lidar) com as condições de trabalho que enfrentam, gerenciar bem o seu tempo, descansar o suficiente, autogestão para minimizar o risco de estresse. Outra coisa que também é importante aplicar é um estilo de vida saudável e exercício. Espera-se que a administração hospitalar implemente adequadamente políticas e estratégias relacionadas à gestão do estresse e da fadiga no local de trabalho.

Palavras-chave: visualização, estresse no trabalho, enfermeiros, biomarcadores salivares.
1 INTRODUCTION

The hospital is an integral part of a social and health organization with the function of providing comprehensive (comprehensive), disease healing (curative) and disease prevention (preventive) services to the community. The hospital is a center for training health workers and medical research. A hospital is a health service institution that organizes complete individual health services that provide inpatient, outpatient and emergency services. The increasing human needs today, especially in the increasingly complex health sector, can affect the increasing work demands of health practitioners in providing services. Hospitals are expected to be able to provide the best health services to the community and are expected to be able to realize this, so that hospitals really need medical personnel who have the ability to provide health services. HR management arrangements in hospitals are very necessary, if management is carried out properly then there will be no more Hospital HR who experience stress due to work.

Health services are one of the duties and responsibilities of a nurse. Providing optimal service is a major contribution to patient recovery. The implementation of services carried out by nurses is usually faced with various conditions that can trigger work stress. Job stress is one of the work barriers for nurses in providing health services. Work stress can have an impact that can be experienced directly or indirectly on several aspects related to physical, psychological, and even behavior. Each individual has strengths and adjustment levels with different frustration thresholds to be able to beat the stress experienced. A person's ability to deal with stress depends on age, gender, occupation, social status, emotions, personality, and level of intelligence.

Work stress is an interactive situation between work situations and people working in that job, which leads to changes in the psychological and physiological status of individuals and affects their normal performance. According to the American Institute of Stress that stress is determined as the main cause of 80% of work accidents and 40% of the financial burden at work. Nursing is known as a stressful job because it is associated with complex job demands and requirements, high expectations, excessive responsibility, and minimal authority have been identified as major stressors. The International Council of Nurses also found the cost of work-related stress is estimated at $200-300 million per year in the United States, and nearly 90% of employee medical problems are caused by work stress, various cases of hospitalization, labor shortages, forced overtime hours, and the attitude of the head of the ward can put pressure on nurses.
Nurses work 24 hours a day and are ready to serve patients continuously. The number of patients that changes every time and the various conditions of patients make it very easy for nurses to experience fatigue and work stress, especially when the ratio of nurses to patients is not up to standard.\textsuperscript{10} Especially if a female nurse is married and working, of course she will go about her daily as part of the family (wife or mother). The gap between work and family will undermine performance and family so that there will be multiple role conflicts between work and family (work-family conflict).\textsuperscript{11}

In addition, work stress on nurses occurs because in carrying out their duties a nurse is not only related to the patient himself, but also related to the patient's family, colleagues, doctors, and the rules that exist in the workplace and even workload which is sometimes considered not in accordance with the physical, psychological, and emotional condition of the nurse.\textsuperscript{12} If the stress that occurs in nurses has reached the peak of the nurse's maximum ability, the nurse's performance will begin to decline because the stress experienced can result in disruption of work implementation so that nurses lose their ability to control and make decisions so that their behavior becomes.\textsuperscript{13} Based on this background, the purpose of this study was to visualize work stress and workload data on nurses at Makassar City Hospital using the salivary biomarker examination approach.

2 METHODS

The research design with a longitudinal study is to conduct an analytical study that aims to follow the development of work stress events in nurses at Makassar city hospitals. Longitudinal research is repeated measurement for one or several variables in each member of the same number of subjects or individuals, which are observed at a number of different points in time. The advantage of this research is that the development of the response variable can be observed over time.\textsuperscript{14} The research will be carried out for 3 years, namely 2023 – 2025. The first year of research, namely 2023, will start from August-September 2023. The research locations will be carried out in 2 (Two) Makassar City Hospitals, namely Labuang Baji Hospital and Daya General Hospital. The number of samples in this study was 100 people. The research implementation begins with analyzing work stress indicators as measured using a questionnaire and a research tool, namely the Cocorometer. Questionnaires were used to collect primary data, namely related to respondent characteristics and workload. The cocorometer tool is used to measure work stress through salivary biomarkers. This tool functions to measure stress
levels based on $\alpha$-amylase in the salivary glands. Data were analyzed using descriptive analysis using Microsoft Excel and SPSS 21 to determine the visualization of work stress data on nurses at Makassar City Hospital with a salivary biomarker examination approach.

3 RESULTS

3.1 RESPONDENT CHARACTERISTICS

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Hospital</th>
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<th>%</th>
<th>Hospital</th>
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<td>Daya General</td>
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<td>Daya General</td>
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<td>98.0</td>
<td>Daya General</td>
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<td>&gt; 8 hours/day</td>
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<td>6.0</td>
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<td>Daya General</td>
<td>11</td>
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<td>20.0</td>
<td></td>
<td>6</td>
<td>12.0</td>
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<td>21</td>
<td>42.0</td>
<td></td>
<td>33</td>
<td>66.0</td>
</tr>
</tbody>
</table>

Source: Primary data (2023)

Based on table 1. above, it can be seen that at Labuang Baji Hospital there are 43 people (86%) who are female and only 7 people (14%) who are male. There were 34 people (68%) who were young, and 16 people (32%) who were middle aged. Then, more respondents had at least D4/S1 education (80%), work experience > 5 years (90%), work duration ≤ 8 hours/day (49%), marital status married (92%), work shifts morning (70%), and inpatient unit (42%). As for Daya General Hospital, it can be seen that 43 people (86%) are female and only 7 people (14%) are male. There were 46 people (92%) who
were young, and 4 people (8.0%) who were middle aged. Then the respondents who had at least a bachelor's degree were more (62%), work experience > 5 years (38%), work duration ≤ 8 hours/day (98%), marital status married (82%), work shifts morning (66%), and inpatient unit (66%).

3.2 DATA VISUALIZATION OF WORK STRESS IN NURSES

![Work stress graph]

Source: Primary data (2023)

Based on the visualization of work stress data in Figure 1, it is known that there were 42 respondents at Labuang Baji Hospital who were not stressed, 5 people who were mildly stressed, 2 people who were stressed and 1 person who was very stressed. Meanwhile, at Daya General Hospital there were 46 people who were not stressed, 2 people who were mildly stressed, 1 person who was stressed and 1 person who was very stressed.
3.3 VISUALIZATION OF WORKLOAD DATA ON NURSES

Based on the visualization of workload data in Figure 2, it is known that of the respondents at Labuang Baji Hospital there were 8 people who did not experience a workload, 26 people experienced a light workload, 16 people experienced a moderate workload and none experienced a heavy workload. Meanwhile, at Daya General Hospital there were 12 people who did not experience a workload, 27 people experienced a light workload, 11 people experienced a moderate workload and none experienced a heavy workload.

4 DISCUSSION

It turns out that work stress among nurses is not a problem in the two Makassar City hospitals, namely Labuang Baji Hospital and Daya General Hospital. This is proven based on work stress data that has been done. Measurement of work stress using cocorometer tool. Using the Cocorometer to analyze whether a worker is experiencing stress or not. By knowing this, a better work system can be created that benefits both workers and the company. Based on the visualization of work stress data in Figure 1, it is known that there were 9 respondents at Labuang Baji Hospital who experienced stress, whether mild, moderate or severe stress. The same is true for respondents who were at
the Daya General Hospital. Found 4 people who experience stress both mild, moderate and severe stress. The incidence of work stress in nurses is influenced by several internal and external factors, such as excessive workload which will cause both physical and mental fatigue and emotional reactions such as headaches, indigestion and irritability. Meanwhile, if the workload is too small, the work that occurs due to reduced movement will cause boredom and a feeling of monotony.\(^{16}\)

Data on work stress at the two hospitals shows that nurses can avoid stress by coping, because the data found does not show a significant number of nurses who experience work stress. This is in accordance with workload data for nurses in both hospitals. There were 16 people at Labuang Baji Hospital who stated that their workload was light. The same is true for nurses at Daya General Hospital. Most nurses stated that their workload was light, namely 27 people.

Stress is unavoidable, but every individual needs to perform coping mechanism techniques to be able to manage the stress that is being experienced. Coping mechanisms are conscious processes and subconscious processes that involve cognitive and behavioral aspects to manage stressful conditions.\(^{17}\) Research conducted by Masaniku (2021) shows that the results of statistical tests using the chi square test obtained a value of Value = 0.003 (<0.05) so that it can be concluded that there is a relationship between coping mechanisms and work stress of nurses at Dr. M.M. Dunda Limboto’s Hospital.\(^{18}\) Another study by Mundung et al (2019) showed that there is a relationship between stress and individual coping mechanisms.\(^{19}\) There are several reasons why nurses at the Labuang Baji Hospital and Daya General Hospital do not experience high work stress, such as having worked for >5 years. Long work periods cause nurses to be able to manage their stress well because they have experience in every condition they face. and the same amount of time so they are less likely to experience stress than nurses who have recently worked. Then the standard working hours are ≤ 8 hours/day. Based on the respondent characteristics data, it also shows that many respondents are married. Married nurses are generally less likely to experience stress at work. Not all people with married status experience work stress, it all depends on their ability to resolve problems in the family so that they do not interfere with their work.\(^{20-23}\) Stress in the workplace is closely related to marital status. Someone who is married will support his family's life, in this study nurses were able to align their household life and work so that marital status is not related. As a
couple, of course you have a place to share and talk about your work, and can provide good emotional support to each other to reduce the stress you feel.\textsuperscript{21,24,25}

5 CONCLUSION

Based on the research results, it can be concluded that the stress data visualization found that respondents at Labuang Baji Hospital contained 42 people who did not experience stress. The same is true for respondents who were at the Daya General Hospital. It was found that 46 people did not experience stress. This is in accordance with workload data for nurses in both hospitals. There were 16 people at Labuang Baji Hospital who stated that their workload was light. The same is true for nurses at Daya General Hospital. Most nurses stated that their workload was light, namely 27 people. It is hoped that nurses will continue to be able to control themselves (coping) against the working conditions they face, manage their time well, get enough rest, self-management to minimize the risk of stress. Another thing that is also important to implement is having a healthy lifestyle and exercising. Hospital management is expected to properly implement policies and strategies related to stress and fatigue management in the workplace.

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