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Ergonomic and hazard risk assessment on meatball sellers

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Abstract
Purpose: The purpose of this study was to measure the ergonomics and hazards of meatball sellers.
Research methodology: For assessing ergonomic and hazard risk on meatball sellers, the researcher use REBA and HIRARC.
Results: The result of REBA is a grand score of 3 which signifies that meatball sellers had a low risk of work and maybe needed change. Meanwhile, based on risk assessment by HIRARC, it is found that one type of hazard is included in the high-risk category from heat from heating pan (boil) meatball broth hazard, two types of hazards that fall into the medium category, namely preparing food while standing and not using assistive devices (gloves) when preparing food, as well as two types of hazards that are classified as the low risk that consist of long working hours/lack of rest and various kinds of customer behavior.
Limitations: Data collection and documentation are still influenced by the accuracy of researchers. In addition, the results of the risk assessment analysis are based on the assumptions of the researcher with all researcher's limited knowledge.
Contribution: This study provides insight about ergonomics, especially about the working posture of meatball sellers, hazard risk they face.
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1. Introduction

Meatballs are one of Indonesian foods that are easy to find anywhere. This is because of its delicious and distinctive taste. This food has many fans. With so many people who like meatballs, meatball sellers are required to be able to meet the tastes of their costumer, one of which is by serving this food that is made from beef and chicken quickly.

The meatball sellers are one type of employment in the informal sector and have been around for a long time from the 1970s and until now it can be said to operate a lot and is quite popular in the community, especially in urban areas. A meatball seller is someone who sells meatballs with a cart that is carried around or stays at one place (store) (Sembiring, 2010).

Meatball sellers have activities that are mostly carried out in a standing position for a long time. If this is done continuously, it is feared that it can lead to the emergence of various health problems which in turn can increase the risk of work accidents or even the emergence of occupational diseases. This can be overcome if ergonomics and hazard factors are involved to make workers in a condition that is effective, comfortable, safe, healthy, and efficient.

Ergonomics are known for having a relationship with human and their job (Jaffar *et al.*, 2011). As per International Ergonomic Association Ergonomics (IEA), ergonomics is the scientific discipline that concerned with the understanding of interactions between humans and other elements of a system, and the profession that applies theory, principles, data, and methods to design in order to optimize human

well-being and overall system performance (Pandve, 2017). In a larger scope, human behavioral, psychological, and physiological capabilities and limitations will be examined by ergonomics (Jaffar *et al.*, 2011).

The purpose of ergonomics is to obtain compatibility between workers and their workstations in order to improve work efficiency, health, safety, comfort, and convenience for workers in using them. If this ergonomic factor is not considered, it will cause work to be inefficient and cause disease in the workplace. A less ergonomic workplace does not cause disease directly because the human body has a large capacity to adapt to a poorly designed workplace and poorly structured job. However, in the end, the effects that occur which are a combination of inefficient activities and/or workplaces will cause the body's coping mechanisms to exceed their proper capacity so that it can cause unavoidable physical symptoms, stress, low productivity, and poor work quality (Sirajudeen *et al.*, 2013).

The ergonomics approach is an approach that is carried out with the aim of balancing workers and their work environment (Sadzah, 2018). The ergonomics approach is very concerned with the interaction of human balance with equipment and the environment so that it causes natural motion (Santoso, 2011). Various risks in the occupation are the possibility of occupational diseases, work-related diseases, and work-related accidents that can cause disability or death. This anticipation must be done by way of adjustment between workers, work processes, and work environment (Setyawan, 2012).

REBA (Rapid Entire Body Assessment) is a method that can determine risk factors related to work posture where this method is an ergonomic body posture assessment method used to evaluate the whole body. REBA analysis provides an overview of work posture evaluation, especially on body posture, movement, applied force, and work repetition. REBA has been specifically developed and designed to examine unpredictable working positions in the healthcare and other services sectors (Ishak *et al.*, 2021). REBA is used to classify the entire body's postural disorders with muscle action, the external loads applied to the body, and the form of grip (Cremasco *et al.*, 2019; Ishak *et al.*, 2021).

An intrinsic physical or chemical feature that has the potential to cause harm to humans, properties, or the environment is defined as a hazard (Shuaib *et al.*, 2021). Anything that can be dangerous, which includes injury, illness, death, and threat to climate, property, and material are included in hazard (Fathullah *et al.*, 2021). A thing or situation with the potential to harm a worker can be categorized as a hazard. There are two categories of occupational hazards: safety hazards that can cause accidents, which harm workers physically, and health hazards, which lead to the development of occupational disease. Once the hazard is recognized, assessing its potential to cause injury and the extent of the hazard is a necessary step in determining how the hazard can be addressed (Mohd Tamrin, 2014).

Meatball sellers also have a fairly worrying hazard risk. Starting from the work attitude that is not ergonomic to the risk of being exposed to high-temperature meatball broth. If this hazard is not addressed immediately, it will bring danger to sellers, and can even cause work accidents.

Hazard Identification, Risk Assessment, and Risk Control (HIRARC) is one of the methods used to identify potential hazards in the workplace by conducting a risk assessment as a form of application of the Occupational Safety and Health Management System. HIRARC plays a very important role in the safety and health management system which is directly related to the prevention and control of hazards (Widodo *et al.*, 2017). HIRARC is applied to determine the type of activity to identify the source of the hazard that can lead to the risk of an accident which will later be controlled for risk with the aim of reducing the level of hazard exposure in each work activity. HIRARC aims to identify all the harmful factors that can cause accidents to workers. In addition, the purpose of HIRARC is as a material consideration of the possible dangers that will occur when in any situation and condition. HIRARC enables workers to plan, introduce and monitor preventive measures against the risk of occupational injury (Buchari *et al.*, 2018).

If you see the magnitude of the work risks and health hazards that will be experienced by sellers, it is necessary to measure ergonomics and hazard risks so that sellers can work effectively, comfortably, safely, healthily, and efficiently. Based on this, the researchers took the initiative to measure the ergonomics and hazards of meatball sellers. The purpose of this study was to measure the ergonomics and hazards of meatball sellers.

2. Methods

Participants

This study was done from February until May 2020 at meatball sellers X that located in Denpasar City, Bali Province, Indonesia. This study is an observational study was conducted on all seven sellers at meatball sellers X.

Instrumentations

REBA (Rapid Entire Body Assessment)

REBA can use easily without the need for an advanced degree in ergonomics or expensive equipment (Middlesworth, 2014). REBA development involved three stages; the documentation of the working posture, the development of the scoring system, and the development of the scale of action steps, which established the level of risk and further actions to be taken (Ishak *et al.*, 2021). REBA worksheet consists of two sections:

1) Section A: the neck, trunk, and legs
2) Section B: the arms and wrists.

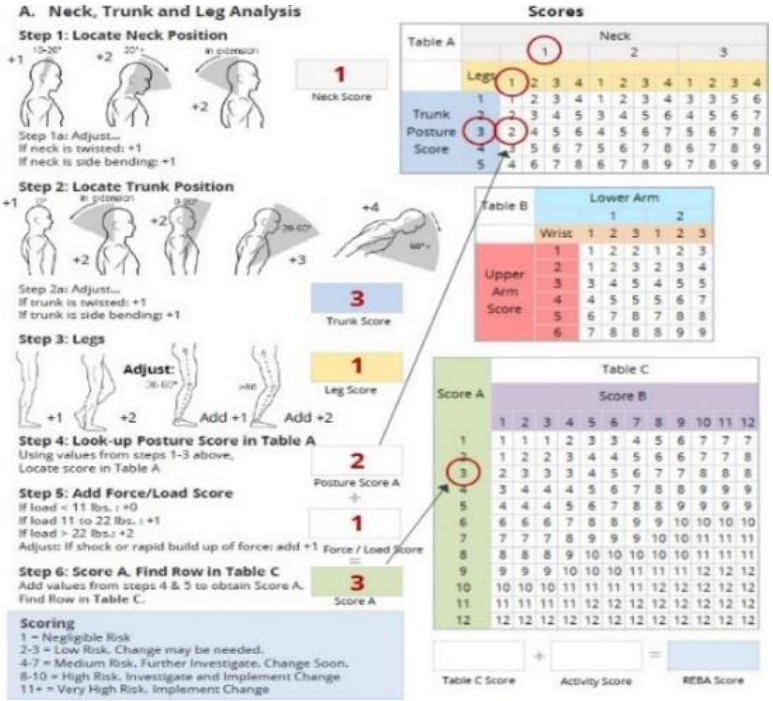

Figure 1. Section A REBA

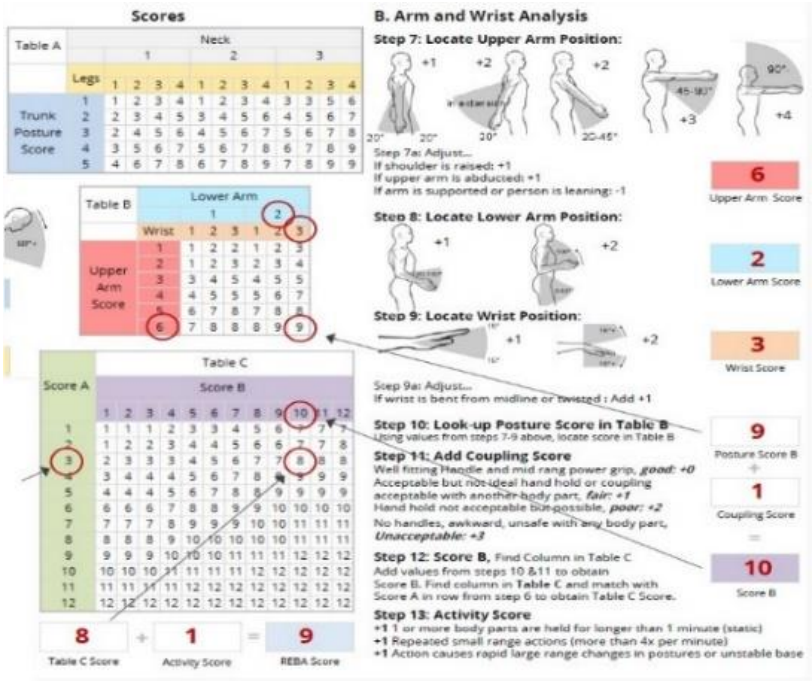

Figure 2. Section B REBA

Three tables are used to determine REBA score: Table A, Table B, and Table C. The score collected in group A will be in Table A and group B in Table B. For both scores, A and B will be added muscle use and force score. Scores A and B that have been calculated will be used to find the score in Table C that then it is REBA score.

Table 1. Classification of REBA

Score	Risk of Work Posture Problem
1	Negligible risk
2 – 3	Low risk, changes may be needed
4 – 7	Medium risk, need further investigation and change soon
8 – 10	High risk, need further investigation and implementation soon
> 11	Very high risk, implementation soon

HIRARC (Hazard Identification, Risk Assessment, and Risk Control)
HIRARC consists of 3 stages which are hazard identification (risk identification), risk assessment, and risk control (Yoga *et al.*, 2019).

1) *Hazard identification*
Anything that has the potential to cause harm, including injury, disease, death, environmental, property, and equipment damage either condition, situation, practice, or behavior is called as a hazard. In this stage, the process of examining each work area and work task to identify all the hazards which are "inherent in the job" will be done (Ahmad *et al.*, 2016).

2) *Risk assessment*
In-depth observations to determine situations, processes, and other hazardous activities or hazards in the workplace are defined as risk assessments. The results will be presented in a risk matrix which will later play an important role in making decisions about risk control that will be carried out (Ahmad *et al.*, 2016). Risk can be calculated using the following formula :

$$\text{Risk (R)} = \text{Likelihood (L)} \times \text{Severity (S)}$$

Table 2. *Severity* Criteria

Level	Criteria	Description
5	Catastrophic	Numerous fatalities, irrecoverable
4	Fatal	Approximately one single fatality major property damage if hazard is realized
3	Serious	Non-fatal injury, permanent disability
2	Minor	Disabling but permanent injury
1	Negligible	Minor abrasions, bruises, cut, first aid type injury

Table 3. *Likelihood* Criteria

Level	Criteria	Description
5	Most likely	The most likely result of the hazard/event being realized
4	Possible	Has a good chance of occurring an is not usual
3	Conceivable	Minght be occur at some time in future
2	Remote	Has not been known to occur after many years
1	Inconceivable	Is practically impossible and has never occured

Table 4. Risk Matrix

Likelihood	Severity				
	1	2	3	4	5
5	5	10	15	20	25
4	4	8	12	16	20
3	3	6	9	12	15
2	2	4	6	8	10
1	1	2	3	4	5

Description :

	=	Low Risk
	=	Medium Risk
	=	High Risk

Table 5. Risk Level

Risk	Criteria	Description
15-25	High	A high risk requires immediate action to control the hazard as detailed in the hierarchy of control
5-12	Medium	A medium risk requires a planned approached to controlling the hazard and applies temporary measures if required
1-4	Low	Acceptable and further reduction may not be necessary

3) *Risk control*

The elimination or deactivation of a hazard in such a way that the hazard does not show a risk to workers is called risk control. Hazards must be controlled at the source where the problem occurs (Ahmad *et al.*, 2016). Eliminating the hazard, or replacing the hazardous process or substance with a safer one, is the most effective form of risk control to take. In addition, it can also be done by decreasing the amount of time or level of exposure to the hazards encountered. Control or design engineering may be used if elimination or substitution is impractical to apply. This means that to reduce the accepted risk, it is necessary to make changes to the work environment, equipment or work processes (Abdurrahman *et al.*, 2014).

Administrative control of risk can be an approach that is sometimes desirable even if it is less necessary because administrative control depends on proper behavior if this approach is to work properly. When all other controls are impractical or there are risks associated with other controls, the use of Personal Protective Equipment (PPE) is the risk control measure chosen. PPE is often the least effective risk control measure because PPE is a secondary and not primary means of defense. The selection of the right equipment, proper installation of equipment and its use at any time when needed are factors that determine the level of effectiveness of the use of PPE (Abdurrahman *et al*., 2014).

3. Results and Discussion

In serving meatballs to customers, the workers on duty in the stall have a regular routine. The first is to fill the bowl with pre-cooked and prepared vermicelli, dumplings, and meatballs. Next, sprinkle the fried onions and chopped soup leaves into the bowl. Then the last thing is to pour the meatball broth before finally a bowl of meatballs is given to the customer.

Basically, three meatball serving processes have almost the same work posture which is dominated by standing position. So, from the three meatball serving processes previously mentioned, the process of pouring the meatball broth (broth) is the process chosen for REBA analysis because in this process the workers seem to use the most of their limbs by considering the angle of movement made by the limbs. Figure 3 shows a seller doing an activity of taking broth when making an order for meatballs.

Figure 3. Meatball Sellers

Table 6. Scoring Group A

Posture	Score	Description	Final Score
Neck	2	The angle is 28° forward	2
Trunk	1	Relatively straight	1
Leg	1	Balance standing	1

The working attitude of the seller when taking the meatball soup showed that the neck was given a score of 2 because it moved about 28º forward, the trunk was given a score of 1 because the back position was still relatively straight, and the legs were given a score of 1 because the foot position was balanced. The score obtained from the observation of the posture of the neck, trunk and legs while working is entered into table A and a score of 1 is obtained as shown in Figure 4.

Table A		Neck											
		1				(2)				3			
	Legs	1	2	3	4	(1)	2	3	4	1	2	3	4
Trunk Posture Score	(1)	1	2	3	4	1	2	3	5	3	3	5	6
	2	2	3	4	5	3	4	5	6	4	5	6	7
	3	2	4	5	6	4	5	6	7	5	6	7	8
	4	3	5	6	7	5	6	7	8	6	7	8	9
	5	4	6	7	8	6	7	8	9	7	8	9	9

Figure 4. Table A REBA

Table 7. Scoring Group B

Posture	Score	Description	Final Score
Upper arm	3	The angle is 57º forward, +1 for abduction	4
Forearm/ Lower arm	1	relatively normal position	1
Wrist	1	The angle is 30º below, +1 for rotating wrist	2

In Table 7 the working attitude of the workforce shows the upper arm is given a score of 3 because it moves 57º forward and abduction occurs when pouring the meatball broth so that the final score is 4, the forearm is given a score of 1 because the work posture is still in a relatively normal position, the wrist is given a score of 1 because it is 30º and below and is given an additional +1 because the wrist rotates so that the final score is 2. resulted in a score of 5 (Figure 5) and there was no increase in the grip score, because at work the worker already held the tool properly.

Table B		Lower Arm					
		(1)			2		
	Wrist	1	(2)	3	1	2	3
Upper Arm Score	1	1	2	2	1	2	3
	2	1	2	3	2	3	4
	3	3	4	5	4	5	5
	(4)	4	5	5	5	6	7
	5	6	7	8	7	8	8
	6	7	8	8	8	9	9

Figure 5. Table B REBA

After entering the final scores of tables A & B in table C, a score of 3 is obtained (Figure 6).

Score A (score form table A +load/force score)	Table C: Score B, (table B value + coupling score)											
	1	2	3	4	(5)	6	7	8	9	10	11	12
(1)	1	1	1	2	3	3	4	5	6	7	7	7
2	1	2	2	3	4	4	5	6	6	7	7	8
3	2	3	3	3	4	5	6	7	7	8	8	8
4	3	4	4	4	5	6	7	8	8	9	9	9
5	4	4	4	5	6	7	8	8	9	9	9	9
6	6	6	6	7	8	8	9	9	10	10	10	10
7	7	7	7	8	9	9	9	10	10	11	11	11
8	8	8	8	9	10	10	10	10	10	11	11	11
9	9	9	9	10	10	10	11	11	11	12	12	12
10	10	10	10	11	11	11	11	12	12	12	12	12
11	11	11	11	11	11	12	12	12	12	12	12	12
12	12	12	12	12	12	12	12	12	12	12	12	12

Figure 6. Table C REBA

Table 8. The Recapitulation of Scoring The Work Posture of Meatball Traders

Activity	Score			Activity Score	REBA Score
	A	B	C		
Filling the bowl with pre-cooked and prepared dumplings, meatballs, and vermicelli	2	2	2	1	3
Sprinkling the fried onions and chopped soup leaves into the bowl	1	2	1	0	1
Pouring the meatball broth	1	5	3	0	3

After knowing the level of risk from the work posture of meatball sellers, the results of the REBA Score Categorization are obtained which can be seen in Table 9.

Table 9. Recapitulation of REBA Score Categorization Meatball Sellers

Activity	REBA Score	Risk of Work Posture Problem
Filling the bowl with pre-cooked and prepared vermicelli, dumplings, and meatballs	3	Low risk, changes may be needed
Sprinkling the fried onions and chopped soup leaves into the bowl	1	Negligible risk
Pouring the meatball broth	3	Low risk, changes may be needed

Based on Table 9, there are one work postures that have a low risk and can be ignored. Although this is not something very dangerous, but the job still needs attention regarding the work posture of sellers.

Meatball sellers X starts activity every day from 09.00 a.m. to 10.00 p.m. For 13 hours they were active selling various menus, including meatballs. Although they perform work postures that tend to be at low risk, they still feel quite high fatigue. This is due to the seller's non-ergonomics work posture which was done by sellers for a long time. They also feel aches, especially in the legs every day due to standing for a long time.

The greater the risk value of the ergonomic position on the body, the greater the possibility of complaints of muscle pain in the body, especially the legs, both in the short term and in the long term. The longer workers work with less ergonomic or careless postures, the more energy is needed to maintain these optimal conditions so that the impact of fatigue is stronger and work productivity decreases (Santoso *et al.*, 2021).

Fatigue describes the entire body's response to activities and exposures received during work (Irawan, 2017). A decrease in physical performance associated with an increase in the real/perceived difficulty of a task or exercise is a sign of fatigue (Abd-Elfattah *et al.*, 2015). Work fatigue that is experienced continuously, will reduce performance and increase the level of work errors (Rahayu *et al.*, 2020).

Working for a relatively long time, which is more than two hours, can cause blood glucose levels to decrease so that the energy supply for muscle and brain work also decreases (Widana, 2017). When the body is in a static position, there is a blockage of blood flow in that section resulting in a lack of

oxygen and glucose from the blood. If this happens continuously, it will cause fatigue (Nugroho *et al.*, 2015). Long hours, exceeding eight hours of working time, make fatigue more and more felt for workers. Their fatigue level will increase along with the number of customers who come during that time span.

Standing work attitude is an attitude of physical and mental alertness so that work activities are carried out faster, stronger, and more thorough (Khasanah *et al.*, 2016). Working standing for long periods of time will make workers always try to maintain their body position, causing a static workload on the back and leg muscles (Santoso *et al.*, 2021). Basically standing is more tiring than sitting and the energy spent standing up is 10-15% more when compared to sitting (Khasanah *et al.*, 2016).

The impact of fatigue is decreased attention, slowing and impediments to perception, slow and difficult thinking, decreased motivation to work, decreased awareness, decreased concentration and accuracy, low work performance, low work quality, and decreased reaction speed. These things will cause many errors to occur so that workers experience injury, work stress, occupational diseases, work accidents that can affect work productivity (Maharja, 2015). Other impacts are not feeling well, decreased performance, enthusiasm, and work productivity. Fatigue will greatly affect work productivity which if not addressed immediately will have a more severe impact on health (Rahayu *et al.*, 2020).

Table 10. Risk Analysis, Evaluation, and Control (Part 1)

Hazard	Risk	Consequence
Heat from Heating Pan (Boil) Meatball Broth (Physical)	Burnt	Blistered hands, burns, peeling skin
Preparing the food while standing (Physical)	Fatigue, skeletal muscle pain	Experiencing musculoskeletal complaints, especially in the hands and feet
Not using assistive devices (gloves) when preparing food (Biology)	Viruses and Bacteria	If it's not hygienic, consumers will get sick too
Long working hours/lack of rest (Psychosocial)	Stress, fatigue	Loss of concentration, dizziness
Various kinds of customer behavior (Psychosocial)	Stress	Loss of concentration, dizziness

Table 11. Risk Analysis, Evaluation, and Control (Part 2)

Hazard	L	C	RR	Level
Heat from Heating Pan (Boil) Meatball Broth (Physical)	5	4	20	High
Preparing the food while standing (Physical)	3	4	12	Medium
Not using assistive devices (gloves) when preparing food (Biology)	2	5	10	Medium
Long working hours/lack of rest (Psychosocial)	2	2	4	Low
Various kinds of customer behavior (Psychosocial)	1	2	2	Low

Table 12. Risk Analysis, Evaluation and Control (Part 3)

Hazard	Description	Risk Control
Heat from Heating Pan (Boil) Meatball Broth	When in contact with the skin, the heat can cause	Use gloves or assistive devices

Hazard	Description	Risk Control
(Physical)	serious burns	
Preparing the food while standing (Physical)	If it is done too long, the seller will experience musculoskeletal complaints, especially in the hands and feet	Using a cloth mat around the pan or replacing a spoon with a heat-insulating handle
Not using assistive devices (gloves) when preparing food (Biology)	Not using assistive devices can lead to the development of viruses and bacteria and cause unhygienic food	Frequently washing hands before preparing food and Use gloves or assistive devices
Long working hours/lack of rest (Psychosocial)	Work continuously without stopping (usually, this happens when it comes to human mealtimes)	Doing active rest in the form of light exercise or relaxation activities for two to five minutes every two hours of work
Various kinds of customer behavior (Psychosocial)	Dealing with various types of customer characters with various requests	Sellers must also be equipped with psychological knowledge such as how to recognize a person's character and deal with various human characters

Table 13. Risk Matrix of Meatball Sellers

L	**S**				
	1	2	3	4	5
5					
4					Heat from Heating Pan (Boil) Meatball Broth (20)
3				Preparing food and drinks while standing (12)	
2		Long working hours/ lack of rest (4)			Not using assistive devices (gloves) when preparing food (10)
1		Various kinds of customer behavior (2)			

Based on the risk assessment that has been carried out, it is found that one type of hazard is included in the high-risk category from heat from heating pan (boil) meatball broth hazard, two types of hazards that fall into the medium category, namely preparing food while standing and not using assistive devices (gloves) when preparing food, as well as two types of hazards that are classified as a low risk that consist of long working hours/lack of rest and various kinds of customer behavior.

Heat from heating pan (boil) meatball broth became a high-risk hazard because when sellers have contact with the skin, the heat can cause serious burns. Burn is a common cause of physical trauma (Sahu *et al.*, 2016). Thermal exposure is the most sensitive thing for humans, especially to the skin, over time. Skin burns injuries can occur due to two things, either due to exposure to low-intensity heat flux in a long period of time or exposure to high-intensity heat flux in a short time where the surface

of human skin is in the temperature range of 31°C to 33°C (Murtaza, 2012). Scar marks, psychological effects, and overall life quality of the affected person are the problem that occurs in skin burn injuries (Almutlaq *et al.*, 2020).

The most common cause of burns is scalding (Almutlaq *et al.*, 2020). Scald is one of the common modes of burn encountered in clinical practice (Sahu *et al.*, 2016). Thermal injuries caused either by hot liquids or steam is called scalds. Not only on the working temperature and exposure time, but the degree of local heat damage also depends on the thermal conductivity, which is very high in liquids. There are no concomitant singeing of hair and no charring, the demarcation against intact skin is mostly sharp and the heat penetration is rather even giving a uniform appearance to some of the special characteristics shown in burns. The depth of the burn is usually limited to the upper layers of the integument (erythema and/or blister formation), but in cases of prolonged contact with hot media complete tissue damage may occur (Pircher *et al.*, 2016).

Working in a standing position and not using assistive devices (gloves) when preparing food are the medium hazard that have the potential to give a risk for sellers. Standing for long periods of time at work can pose serious health risks. Fatigue, muscle cramps, and joint pain in workers are effects caused by standing too long. Stress, fatigue and discomfort, leg swelling, pain in the shins, knees, thighs, hips, and lower back are risks that arise in workers who stand for too long. Hypotension in the early days and hypertension in later life stages will occur if the worker stands for eight hours or more. A decrease in pressure and an increase in pulse rate by 10-50% will occur when in a standing posture which then causes a decrease in blood volume. The cardiac muscle will work more to reduce the blood supply to vital organs which then causes thickening of the heart wall which leads to cardiac disease (Reza & Asadullah, 2013).

Of the various risks found, several measures or control methods are needed, including using personal protective equipment (PPE) in the form of gloves when doing work. This not only serves to prevent work accidents such as burns, blisters, or bleeding wounds but also as a form of hygiene so that the food and drinks served can still be guaranteed cleanliness and food safety so that both customers and workers do not experience illness or work accidents.

In addition, doing active rest in the form of light exercise or relaxation activity such as stretching also needs to be done between activities. At least for two until five minutes every two hours of work to avoid the occurrence of more severe musculoskeletal disorders in sellers. Moving dynamically through stretching is needed so that the muscles and skeleton do not experience stiffness, dislocation, or inflammation.

A period of rest that includes one or more cognitively stimulating tasks alongside physical rest is described as active rest (Pyke *et al.*, 2020). The provision of rest periods is intended to:
(1) Prevent fatigue resulting in physical and mental abilities and loss of work efficiency;
(2) Give the body a chance to recover and refresh; and
(3) Providing time for social contact after workload.
Providing active rest periods can improve and maintain work performance (Damantalm, 2018). Through active rest, workers can move more dynamically and can prevent muscle disorders (Sutapa *et al.*, 2017).

Stretching is an exercise to maintain and restore flexibility (Ningsih, 2013). Stretching between work hours is a habit of physical activity at work to improve blood circulation so that it helps relax nervous tension and trains muscles to be stronger so they don't get tired easily while working (Priyoto & Wahyuning, 2019).

Workers should also continue to be monitored, especially for their psychological condition. Working for long hours and dealing with large numbers of people is not easy. This is very draining psychologically (emotionally) which then has an impact on the onset of fatigue faster than it should

be. A personal (psychological) approach from superiors to subordinates will be very helpful in reducing the dangers arising from these psychosocial factors. It would be even better if workers were also given knowledge in the field of psychology to prevent the emergence of stress which then made workers able to deal with the existing pressures.

4. Conclusion

The result of REBA is a grand score of 3 which signifies that meatball sellers had a low risk of work and maybe needed change. Although, this is not something that is very dangerous, but the job still needs attention regarding the work posture of sellers. Meanwhile, based on risk assessment by HIRARC that has been carried out, it is found that one type of hazard is included in the high-risk category from heat from heating pan (boil) meatball broth hazard, two types of hazards that fall into the medium category, namely preparing food while standing and not using assistive devices (gloves) when preparing food, as well as two types of hazards that are classified as the low risk that consist of long working hours/lack of rest and various kinds of customer behavior.

Although working as a meatball trader has a low ergonomic risk, traders still need to take care of themselves to avoid health hazards, accidents, and occupational diseases. Doing active rest in the form of light exercise or relaxation activity such as stretching also need to be done between activities for two until five minutes every two hours of work and using personal protective equipment (PPE) such as gloves will help sellers to avoid health hazards, accidents, and occupational diseases so that sellers can work effectively, comfortably, safely, healthily and efficiently.

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Competing Interests

There is no conflict of interest.

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