

Safety and health in informal sector: a case study occupational fatigue of porters at Legi Market, Surakarta

Ria Nuril Hidayati^{1*}, Agus Surono², Vena Jaladara²

Abstract

Purpose: Understanding the application of OSH Management System in the informal sector, especially the occupational fatigue management system for the porters working in Legi traditional market, Surakarta. **Methods:** The type of research was qualitative based research to describe the implementation of OHS Management System in the informal sector, especially the occupational fatigue management system for porters working in Legi traditional market, Surakarta. **Results:** OHS Management System's promotive and preventive efforts, in this case, have not yet reached and involved the porters and have not focused on minimizing the risk of occupational fatigue. The weight of the load carried by porters exceeds the recommended weight threshold and their work posture had a risk of injury and occupational diseases. The occupational fatigue commonly experienced by the porters was such as muscle pain in the knees, lower back pain, and some even getting whole body pain. The problems in implementing OHS Management System at Legi traditional market were due to there was no lifting and transportation equipment available, Station of Occupational Health Effort (*Pos UKK*) administrators not been trained of implementing OHS in the workplace, and the lack of enthusiasm from the market management and the porters themselves in OHS. **Conclusions:** The implementation of the OHS Management System did not include efforts for minimizing occupational fatigue for the porters. The *Pos UKK* needs to involve the porter organization (*SPTI*) in the implementation of promotive and minimize efforts to manage occupational fatigue. It is necessary to form an OSH policy and committee with support and cooperation from all related parties such as the Trade Department ("*Dinas Perdagangan*") which has the workplace area and the Health Department ("*Dinas Kesehatan*") which supervise for OHS efforts in term of implementation of OHS Management System in the informal sector is highly expected.

Keywords: informal sector; occupational fatigue; OHS management system; porters

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¹Student Master of Public Health, Faculty Medicine, Public Health and Nursing, Universitas Gadjah Mada

²Departement of Behavior, Environmental Health and Social Medicine, Faculty Medicine, Public Health and Nursing, Universitas Gadjah Mada

*Correspondence:
ria.nuril.h@mail.ugm.ac.id

INTRODUCTION

The informal sector currently plays an important role in the Indonesian economy. According to the February 2020 monthly socio-economic data report, it was recorded that 56.99 million people (43.50 percent) of the population work in formal activities and 74.04 million people (56.50 percent) work in informal activities [1]. The informal workers make up a significant proportion of workers in Indonesia. However, they often work in substandard conditions, where they are exposed to various hazards in the workplace without proper training and information on Occupational Safety and Health (OSH). There is an urgent need to present practical matters regarding OSH protection measures for workers [2].

The informal sectors need special attention in implementing health, safety and environmental management systems due to the high risk of accidents and health deterioration related to an unsafe work environment, as well as low health insurance by business owners. The informal sector is also out of state regulations and control, including those that are related to (OSH) and social protection [3].

In the "low to middle income" countries, occupational health is often becoming low priority and low employee protection [4]. In India, the Occupational Health and Safety (OSH) of workers in the informal economy, especially women workers, has been neglected, lack of constructive public policies, strong political commitment, and an ideological orientation towards completing the health, safety and infrastructure needs required by women workers in the informal economy [5].

In the Philippines, the implementation of SMK3 for the informal sector is based on the existence of a national regulation called the Administrative Order (2013-2018), the aim is to prevent the occurrence of illness in informal sector workers through identification, risk assessment and evaluation. The implementation of SMK3 is also supported by the existence of social, mental, and other support for the smooth running of this SMK3 program [6].

One of the Indonesian government's attention to OSH in the informal sector is the program implemented through public health center (Puskesmas), namely community-based occupational health efforts program, one of which is the Station of Occupational Health Effort (Pos Upaya Kesehatan Kerja/ Pos UKK). Public health centers (Puskesmas) that have implemented basic occupational health in 2018 reached 6,963 health centers (69.68%) [7].

Research conducted on informal sector workers in the Sasirangan industry, workers' health and occupational health development were relatively neglected. The solution to various obstacles in implementing OSH was by implementing the Station of Occupational Health Effort (Pos UKK). The results showed that the implementation of Pos UKK had an active effect on workers' awareness of OSH. Informal sector workers in the Sasirangan industry need support from employers in implementing Pos UKK [8].

Fatigue is increasingly recognized as a problem affecting the workforce. Nearly every worker in America (97%) is at risk of fatigue, so fatigue is likely to affect every workforce [9]. A meta-analysis of 27 observational studies estimated that up to 13% of workplace injuries occur due to fatigue [10].

Porters are one of the informal sector workers who have a high risk of fatigue. An Indian study involving 300 porters in a vegetable market in Calcutta, India, routinely transporting 100-120 kg of weight, most of whom were at high risk of developing musculoskeletal complaints or other injuries [11]. Another study analyzed fatigue due to the risk of musculoskeletal complaints in manual lifting, which can be relieved by trolleys [12]. In the United States in 2015, there were 1.15 million cases of non-fatal work-related accidents and diseases, due to heavy and tiring work, and manual lifting [13].

Another study in Zimbabwe that involved the informal sector in waste management involved strenuous activities such as moving and transporting manual goods every day which can trigger occupational fatigue [14]. Research involving market porters in Monda Market, Secunderaba, showed that the approach method through improving the work environment was an effective way of managing to improve health, reduced occupational fatigue and stress [15].

Overcoming fatigue requires an approach using the OSH management system which is an effective and important way to be applied in all types of work environments. The role of workplace institutions is very significant in implementing the OSH management system, especially focusing on fatigue risk management in the workplace [16]. Fatigue can be overcome when the management system is driven directly by the workplace. In the small economic sector, institutions should be more concerned [17].

In Indonesia, the characteristics of porters in manual transport from research at Pasar 16 Ilir Palembang showed that the average load of workers is 92.9 kg [18]. Research conducted on 108 manual lifters who carried heavy loads on the back from eight cities

in Indonesia showed that musculoskeletal pain was complained of in all parts of the body. Symptoms were most reported in the lower back (72.2%), legs (69.4%), knees (64%), shoulders (47.2%), and neck (41.7%) [19].

Pasar Legi is the main market, which is the center for buying and selling of necessities, with the largest number of porters among the markets in Surakarta, namely 400 male porters and 200 female porters. Lifting work that is carried out does not use tools or safety tools. The weight of the load that a woman carries on average is 40-60 kg per day, the total weight of a day that can be carried around 500-1500 kg. The male porters carry an average load of 85-100 kg each time, a total of around 5,000-10,000 kg per day. All porters put the load carried on their backs. Previous research involving 92 female porters in Pasar Legi, Surakarta stated that there was a relationship between workload and occupational fatigue [20].

METHODS

This study used a qualitative approach with a case study design. This study analyzed the application of OSH management systems in the informal sector, especially the occupational fatigue management system of porters in Legi Market, Surakarta. This case study was conducted through in-depth interviews, document review and field observations. The research subjects were 13 people from the Trade Office, Legi Market officials, Pos UKK administrators, environmental health administrators, porters organizations, and porters. The research subjects were selected by purposive sampling technique, for porters the sampling technique used was purposive random sampling technique.

The variables of this research were OSH management system promotive efforts in controlling occupational fatigue, SMK3 preventive efforts in controlling occupational fatigue and occupational fatigue. The instrument used in this study was an interview guide, sheet observation, cell phones, voice recorders, cameras, and stationery.

RESULTS

Overview of porters in Legi Market

The porters of Legi market were informal sector workers that organized under an organization, namely Indonesian Transport Workers Union (Serikat Pekerja Transport Indonesia/SPTI). The main requirement of being a porter in Legi market was having an SPTI membership card. Because there were no additional members, new members have to buy membership cards from old members who will retire. Currently

membership price at SPTI can be up to tens of millions rupiah.

"...looking for members first, buying from the old members who want to quit ... If it used to be the price of seven thousand and five hundred rupiah ... recently around thirty million rupiah." (Porter-R7 stated)."

Loaded rates varied depending on the area and the short distance of the haul. The Komnyai area, the distance to the transportation, was calculated on the average per one quintal (100 kg) of IDR. 2,000.00.

"per quintal ... lift down two thousand rupiah, if lift up two thousand rupiah." (Porter-R8 stated)

Vegetable area for men porters of short distance per lifting (70-100kg) cost IDR 2,000.00. If it was a long distance, each lifting cost IDR 6,000.00..

"... per quintal, it's six thousand, from the second floor first. But now, after that the market burnt, it is to be a shorter distance, only three thousand, two thousand ... " (Porter-R10 stated)

Female porters per lifting of 50-100 kg with long or short distance load cost was IDR 4,000.00 - IDR 6,000.00. If you had subscribed and short distance per 50 kg, it cost only IDR 2,000.00.

"... five thousand per lifting 50-60 kilos, just as long and short distance same cost, if already subscribed to middlemen" (Porter-R4 stated)

"yes if it's far away it's six thousand, if you have subscribed only close to there, at most two thousand" (Porter-R6 stated)

Occupational Health and Safety Management System in Informal Sector

Promotive Effort

1) Mobile Broadcast (Sirling/Siaran Keliling)

Mobile broadcast was a programme from Pos UKK (Pos Upaya Kesehatan Kerja/Station of Occupational Health Effort) aimed to give health education by walking around the traditional market, using loudspeakers to speak.

"...we used to walk around in the middle of the market, holding megaphone. We told them if we were going to hold a health service, 'Do you want to have a health check, ma'am?' When we had counseling, for example, we just directly explained it, while driving around in the car. Now, we are using a long microphone for mobile broadcast." (Health Officer-R12 stated)

Mobile broadcast was held once a month, at minimum, with different subjects based on the latest health issue, or the most popular health problem in the market.

"We decide the materials, based on the most common cases related, sometimes it is myalgia, hypertension, diabetes, or dengue fever, it depends on us. (Health Officer-R12 stated)

This programme was still running, despite the market being burnt down. In this pandemic time, the once in a month mobile broadcast was held once in a week, along with Mask Inspection (Roker/Ronda Masker).

"The mobile broadcast programmes are still running, what used to be once in a month, now becomes once in a week due to COVID." (Health Officer-R12 stated)

Four out of 7 porters informants (targets) were familiar with mobile broadcast programs. The group of informants who work in the front market area were not familiar with this programme.

"There were counsellings before, what was the sickness, what happened; things like that. It was from a public health center." (Porter-R10 stated)

"There was nothing." (Porter-R8 stated)

2) Mask inspection (Roker/Ronda Masker)

Mask inspection was a programme run by market administrator, they were market superintendent and staff, representatives from market porter, and cadres from Pos UKK. This programme was held during COVID-19 pandemic. It aimed at face mask wear and health protocol inspection, and also pandemic-related health education. The programme was conducted everyday at 9 a.m. by walking around the market with a loudspeaker.

"As for today, I ask market porters to participate. We do mask inspection during pandemics, to remind them about health protocol." (Market Superintendent-R2 stated)

3) BPJS ketenagakerjaan (employment social security) socialization

BPJS visited Pasar Legi for BPJS Ketenagakerjaan socialization. This programme aimed only at market porters. The market administrator, through SPTI (Serikat Pekerja Transportasi Indonesia/Indonesia's transportation workers union) invited the porters and provided the venue, however, only few of them came.

"...nowadays, porters are encouraged to join BPJS Ketenagakerjaan and some of them have already joined... particularly for SPTI. Socialization started around a month ago (October 5, 2020). We just provided the venue. BPJS handled the registration themselves." (Market Superintendent-R2 stated)

All seven targets of porter informants did not own BPJS Ketenagakerjaan membership and were not aware of the previous socialization.

"There was nothing about BPJS." (Porter-R6 stated)

"I don't have BPJS, there was no announcement." (Porter-R7 stated)

Preventive Effort

1) Laboratory check

Laboratory check programme was held once a month along with the opening of Pos UKK in Legi market.

"For preventive (effort) we have mobile counseling, mobile broadcast, lab check once a month. Anyone can join, as long as they are willing to pay if they don't have KIS (Kartu Indonesia Sehat/National Healthcare Security card). It is simple lab check, for cholesterol, blood sugar, uric acid." (Porter-12 stated)

2) Sanitation inspection

Sanitation inspection was a programme for environmental health monitoring. These monitoring included physical factors in the workplace, for example humidity, lighting, noise, and chemical factors as in dust level. Physical factor and dust level monitoring was held once a year by the Public Health Office and public health center.

"Humidity, lighting, noise and dust level monitoring has been done once a year, in the Sanitation Inspection programme by the Public Health Office and public health center. So, it's not only waste management, sanitation facility checking, workplace building and food stall hygiene." (Environmental health officer-R13)

3) Fire fighting training

Fire fighting training became a routine programme held in turn every year by all the traditional markets in Surakarta. This year was Legi market's turn to do the training.

"It happened to be Legi market's turn, it is held every year, last year was in Klawer market, in Singosari. If it's possible, then it depends on the (Fire and Rescue) Office to hold training here." (Market Superintendent-R2 stated)

This programme involved Surakarta's Fire Fighters, market's staff, such as market securities, market trader representatives and market porter representatives.

"We involve fire fighters for this training, we also involve the securities and trader community, I also ask market porters to get involved too." (Market Superintendent-R2 stated)

4) Corporate social responsibility (CSR)

Corporate Social Responsibility groups were quite varied in Legi market, some of them were groceries from policewomen, masks from Rotary Club, young entrepreneurs and businesswomen.

"Usually it's related with groceries from policewomen, masks from Rotary Club, young entrepreneurs, business women." (Market Superintendent-R2 stated)

Curative Effort

Curative program was implemented by opening a Pos UKK medical check mobile service once a week every Thursday at the Legi Market. After the market had fired, a medical check directly visited the Puskesmas.

"If here at Puskesmas Setabelan ... that was an old program (Pos UKK medical check mobile), routinely every Thursday, once a week, such as blood pressure, check blood sugar, if there are indications of complaints, then they are referred to the hospital. (Health officer-R12 stated)

Regarding the BPJS system, almost all porters came from outside the Surakarta area, the Puskesmas provides free medical checks for 3 times, for out-of-town patients who have KIS. The porters chose not to check their health, if they had to pay.

"The problem is that the porters are not in this area (Surakarta) Sis, usually outside the city ... If they are from outside the city they have to pay... at most 3 times the chance if they have BPJS or KIS, after 3 times the chance they pay. If they have to pay, it's better for them not to check their health, ("Sir, why pay?" a porter said) hehehe, so I'll just measure blood pressure." (Health officer-R11 stated)

Rehabilitative Efforts

Puskesmas Setabelan already has a physiotherapist for rehabilitative efforts, previously there were none.

"In the past we did not have physiotherapy for rehabilitative therapy...But, now we have physiotherapy, so patients can come here ..." (Health officer-R12 stated).

Occupational fatigue management as an effort to minimize occupational fatigue risk

Market administrator, public health center or SPTI organization had not formed particular management to handle occupational fatigue in Legi market.

"For market porters' community in particular, it is a risky job. They help accelerate market activity, their health must be put into attention, to make it safe for everyone, so they can work more comfortably and be protected. But, you know, we realized that their Occupational Health and Safety has not yet been noticed especially for them. Nothing, for now it's nothing yet, miss..." (Market Superintendent-R2 stated)

Occupational fatigue

An Overview of the Working Procedure

Market porters in Legi market carried the load by pickabacking them. Female market porters carried them by using selendang, a kind of shawl cloth. Most of the male market porters did not use any supporting device, and some of them in the vegetable group were using ganco, a kind of hook with a handle to ease them in carrying.

"I already used shawl cloth since long ago, and no, there's no trolley." (Porter-R4 stated)

"Yes, this is how I carry, by pickabacking, since the beginning." Porter-R8 stated)



Picture 1. How the porters work

Researchers observed 3 female market porters and 4 male market porters for each of the informant's work days. The researcher observed the load carried in one time, the average amount of load, and time needed for loading per day work with the result:

Table 1. Load and time observation results of the carriage

Informant	One loading (kg)	Total load a day (kg)	Number of lifting	Total minutes	Total hours	Number of lifting /hours
R4	50-70	900-1080	18	175	2.9	6.2
R5	50-70	650-750	13	66	1.1	11.8
R6	50	750	15	60	1.0	15.0
R7	100	12000	120	189	3.2	38.1
R8	100	10700	107	153	2.6	42.0
R9	100	11200	112	164	2.7	41.0
R10	80-100	7360-9200	92	230	3.8	24.0

Table 2. The results of load analyse with NAB (threshold limit value/occupational exposure value)

Informant	One loading (kg)	Number of lifting	Number of lifting /hours	Total hours	>NAB (Zona)	Load as NAB (kg)
R4	50-70	18	6.2	2.9	2	27
R5	50-70	13	11.8	1.1	1	32
R6	50	15	15.0	1.0	1	32
R7	100	120	38.1	3.2	3	14
R8	100	107	42.0	2.6	3	14
R9	100	112	41.0	2.7	3	14
R10	80-100	92	24.0	3.8	2	27

Female market porters carried 50-70 kg loads at one time, with 8-15 carrying times in total depending on how busy the market was that day. On busy days, they were able to carry up to 20 carrying times per day.

"Well it depends, on a less crowded day there would be only 8 (carrying times). There could be 15 on a crowded day. Could be 20 too. But now, it's hard to get 20. We could get 20 before the market was burnt down." (Porter-R6 stated)

In the Komnyai area, there were more loading activities during crowded times. It might reach dozens of tons per day per market porter.

"It's dozens of tons, per person. Here, there are hundreds of tons loaded, but it's shared. One big truck holds 25 tons." (Porter-R9 stated)

"Around five tons when the market is not crowded, around twenty-or-more tons per day on crowded days." (Porter-R7 stated)

In the vegetable area, male market porter group was able to load 8-10 rit (cargo car), where one cargo car could load 4-20 tons, depending on the car type. One person was able to carry 10-15 ton per day. In that area, they did not weigh the package first, but in a cart or sack. One sack weighed 80-100 kilos.

"It's around 8-10 cargo cars per day. If we count them, 10-15 tons per person... Per carry... well, that's in carts (all in sacks) so, they vary, sometimes 80, 90, sometimes 100, they vary." (Porter-R10 stated)

Years of Working and Age

57 and 58-year-old male market porter informants with 36 and 40 years of working experience a difference in occupational fatigue when they were young with now, when they are older. The older they are, they complain more easily of fatigue and it is harder to get relieved.

"...when I was younger, I could relieve it (occupational fatigue) by taking a bath, now up until night, even morning before work I still feel fatigue. It's hard to sleep, sore all over. So much different from the past, now it's just so tiresome." (Porter-R7 stated)

Female Market Porters with Their Double Role as Housewives

For female market porters, they were still working despite their role as housewife.

"I'm just okay with it, our fortune is arranged." (Porter-R5 stated)

Related to their role as housewives, they did not feel it as a burden to keep working.

"They're grown ups (the children), they're taking care of themselves now, their grandparents took care of them when they're kids, left them (for work) already when they're 35-day-old, just didn't aware how they grew up, when they're grown ups it's just making me more spirited." (Porter-R5 stated)

"I cook once (a day), I'll buy the cooked food in the market later, no problem with my household, kids are grown ups." (Porter-R6 stated)

Occupational Fatigue, Work Accident and Countermeasure Effort by Market Porters

1) Complaints on inconveniences due to occupational fatigue

Most of the complaints of inconvenience from the market porters were muscle pains and fatigue. From the medical records taken by Pos UKK in Legi market from 2015 to 2017, there were 15 patient visits from market porters. Data showed 10 out of 15 patients complained about muscle pains and fatigue. The UKK administrator also stated that most of the market porters complained about muscle pains and fatigue.

"Dizzy and myalgia in average, as in stiffness for myalgia...nothing else, maybe if there's something severe I'd ask them to go here (public health center), usually they said that the myalgia was on their knees, and backs, and also high blood pressure." (Health officer-R11 stated).

The inconvenience complaints from all 7 porter informants were about fatigue. One porter informant complained that the fatigue occurred only when the informant lifted up goods.

"It's just stiffness, I will not feel it when I stop working." (Porter-R8 stated)

Other six porter informants complained about fatigue all over their bodies, in which one informant felt fatigue continuously until the next day and experienced difficulty in sleeping.

"Sometimes it was so sore." Porter-R9 stated)

"...I still felt tired the next morning. So difficult to sleep, stiff all over." (Porter-R7 stated)

From those 6 porter informants, they were not just experiencing fatigue, 3 of them complained about soreness on their feet, 2 felt sore on their backs, 1 felt sore on the back and feet and had a history of rheumatism and uric acid.

"My feet, they felt hurt all over...tired, so tired" (Porter-R7 stated)

"My back hurt the most, you know, being a porter." (Porter-R9 stated)

2) Work accident

Aside from soreness and fatigue, market porters also experienced work accidents, such as falling down or struck down by falling loads.

"I fell once, because I couldn't carry a 150 kilos load. Sometimes because I slipped, that's normal... Sometimes just unlucky, we got struck down. But it's okay, they're just bruises." (Porter-R9 stated)

The report on work accidents by the public health center was put into the work accidents category, however, it was not confirmed whether the patients were from Legi market or not, since all of them were put into general patients' category. Likewise, for the reports of occupational disease (Penyakit Akibat Kerja/PAK) administrator was only pulling the data, it was the doctor's decision to put them into occupational disease category or not. Complaints about fatigue in Pos UKK were put into general complaints.

"Not only from Legi market, work accidents from other places were taken here, grinder-related-accident for example... All of them were put into the same category, so we couldn't tell the origin, whether from market or other. Just like occupational disease, I just pulled the data, it was up to the doctor's decision. We put fatigue in the general disease category." (Market superintendent-R12 stated)

3) Decreased work productivity

The result of fatigue and work accidents was the decreasing of work productivity, which led into the decreasing of loading amount and day-offs.

"...it hurts so much, I feel tired all over, I'm off from work now. Sometimes there were only 3 days (of work) per week, sometimes I could work until Saturday." (Porter-R7 stated)

"I felt unwell sometimes, tired, sometimes I could only carry a few, sometimes I could carry loads." (Porter-R8 stated)

Countermeasures for fatigue and work accident by market porters

The porter informants sought treatments in the health center, consumed over-the-counter sore medicine, consumed herbal drinks, did skin scraping/coin rubbing, massaging, and took a rest at home to overcome fatigue and injury due to the accident.

"When I had rheumatism and uric acid, I went to the doctor, or to a mobile public health center (Pos UKK service) near the mosque there. Now, I just consume herbal drinks..." (Porter-R10 stated)

"Massaging, skin coining, that's all, I never went to the doctor. Sometimes I just drink herbal medicine." (Porter-R6 stated)

"I fell once...got muscle sprain...I massaged it and it healed." (Porter-R8 stated)

Challenges on occupational health and safety implementation and fatigue management in legi market

Market's Part

The attempt on providing carrying-loading helping tools in Legi market for market porters that need them had not come to realization, even though they were already provided in other markets in Surakarta.

"In other markets, we gave them facility to ease them (the porters) in working, in Pasar Gede, we gave them some kind of trolleys...we tried to accommodate through CSR...so that the market porters...worked at ease and didn't feel physical burden...we had that in Pasar Gede. In Pasar Klewer, we also provided trolleys...even in the two-storey markets, we have provided that, that's what we care about the heavers and market porters...but we haven't got that in Legi market." (Trade department-R1 stated)

Market administrator had not owned responsibility and part to ask market porters organization (SPTI) to get involved into health programmes.

"That's different, there's the chief in SPTI. Usually we were only being informed, programme involvement is not our concern, we concern the traders. Contributions, hygiene, security and market care are Trade Service's concerns. It will be through us if it's about aids. Usually, they contact the chief, and then the chief will contact the members." (Market superintendent-R2 stated)

SPTI's Part (Serikat Pekerja Transport Indonesia)

Serikat Pekerja Transport Indonesia (SPTI/ Indonesia's transportation workers union) had difficulty in trying to propose something related to market porters since they felt they did not own authority.

"What can I do? I'm just underling, I don't know the solution for the market porters. The government hasn't got a solution...the government, the Trade Service didn't invite us to join, so I... don't know how to complain, I'm just underling. I hope the government can be more responsive to the members, thank you." (SPTI Practitioner-R3 stated)

Public Health Center's Part (Station of Occupational Health Effort/ Pos UKK)

There was not any decent place or space provided for health-related program like Pos UKK.

"We used to have a kiosk...provided for us for the examination room. But since the kiosk price was high, the trader finally sold it. Then, we were given a place in Legi market's security station, we couldn't keep everything clean there...so we couldn't make posters (for Pos UKK) like that." (Health officer-R12 stated)

There were differences on how market superintendents support the Pos UKK programme.

"...each market superintendent is different. Some of them were enthusiastic, some of them not. The enthusiastic one always serves us (with food/snacks), then calls everyone to check. But some are nonchalant. Up to you, I don't want to know about your health-related job." (Health officer-R12 stated)

Pos UKK administrator were not aware of the market porter's organization in Legi market, which led to Pos UKK had not asked SPTI to get involved yet.

"That's the difficulty and there are rarely any associations. We had chief of associations in other places. Here, I haven't heard about that (the association). Yes, I haven't heard of Legi market, market porter association, I haven't heard. There was (association) in the terminal. Market administrator never gave us information." (Health Officer-R11 stated)

The administrators for Pos UKK programme were enthusiastic enough, but they encountered obstacles in the knowledge of occupational health itself.

"UKK is not only about medical/health check. Here, we haven't got a particular person put in that position. There was Occupational Health and Safety training, but we haven't got that until now, and we're still confused with the basics, is it from nurses or environmental health? We're talking about occupational health, we're still confused about that...and mostly, the mindset is that the UKK is about opening clinics in the traditional market. In reality, it's not that simple." (Health Officer-R11 stated)

There was no specific funding source for the Pos UKK programme and the fund was limited.

"...the budget in Setabelan public health center is the least among other seventeen public health centers, so we do budgeting based on the priority list. Then, the budget for UKK is put on the very last, since we have more Plan As like family planning, infectious diseases, moreover in this pandemic situation, all budgets are for pandemic (countermeasures)...no matter how big the budget is. For UKK, even though we propose the budget for this and that, if it's possible, we combine it with other programmes. There's not specific budget for UKK in this public health center..." (Health officer-R12 stated)

Market Porter's Side

The market porters lacked enthusiasm for health-related programs.

"I can't go for that kind of counsellings, the traders will be troubled if we don't come, I prefer to work for some money." (Porter-R5 stated)

DISCUSSION

The informal workers, the porters, from the results, are an organized group under the SPTI organization, the type of organized group service consisting of Pos UKK and Puskesmas. Porters also have the characteristics, which makes them categorized as informal workers, where working in the service sector free workers and not tied to a work agreement or work contract with an irregular income [21].

The results showed that curative and rehabilitative efforts held by Pos UKK or Puskesmas Setabelan accessible in free of charge for those who live in Surakarta and have a KIS. Outside the domicile of Surakarta and those who do not have a KIS must pay. For this reason, the porters of Legi market prefer to curative and rehabilitative services provided in where they live. As a result, Pos UKK's curative efforts are less attractive. For the results of this study, the researcher will discuss more focus on promotive and preventive programs in minimizing work fatigue, which efforts are more effective than curative and rehabilitative [22,23], as per the National Health System which focuses on promotive and preventive health efforts [24].

Occupational health and safety management system, promotive efforts to minimize the risk of occupational fatigue

Occupational Safety and Health Management System Promotional Efforts in the form of Mobile Broadcasts, but these broadcasts have not reached all porters, especially porters in the front shops who do

not know the information and activities. The material presented in the mobile broadcasts is also common topic health which usually about diseases or epidemics that are hot or the most frequently complained of, such as tuberculosis, dengue fever, and muscle pain, so it does not lead to materials related to fatigue control [25,26]. It is necessary to add other way and media of information to carry out promotional activities, such as placing posters and banners at strategic venues. Involving each head of porters in order to be educated and trained being a role model and extension of the workforce health cadres for fatigue management can be done for promotion in stages [8]. Educational materials, socialization can be more enriched about K3 for porters, namely the introduction of occupational risks, high productivity through an ergonomics approach, how to lift and transport, and the function of transportation means, [21,23]. Another promotional effort that is incidental is the Roker (Ronda Masker-Mask Inspection) which is carried out during the covid-19 outbreak. This activity needs to be an example for other promotional efforts where the activity is carried out by involving the cooperation of representatives of all market parties and Pos UKK.

Occupational health and safety management system, preventive efforts to minimize the risk of occupational fatigue

Occupational Safety and Health Management Systems Preventive measures in the form of sanitation inspections related to environmental health have run well enough in the implementation schedule to cross-program reporting. Sanitation inspection in which there is the monitoring of measurements of air humidity, lighting, noise, and dust levels are environmental factors that deserve attention in controlling fatigue [25,27] which has been carried out annually. Measurement results and suggestions for improvement will be provided to the Trade Department through the Health Department. Sanitation inspection is an activity that is included in the Healthy Market promotion program [28]. Other preventive activities are laboratory checks for constraints as well as curative programs that blocked from the system. This check can be used for early detection and control of individual workers [22] related to lifestyle such as occupational nutrition related to uric acid levels [29]. The market also provides training in firefighting, but another training related to fatigue control such as proper lifting and transportation training has not been implemented [25]. The management realizes that Pos UKK does not only open mobile health services, but administrators are lack of knowledge of OSH. Education and training

can help make an assessment (identification and assessment) of risks and their control, determine the underlying causes of a problem in the informal sector workplace [6]. So that programs and activities that are preventive can be more varied and effective [25,30].

Occupational fatigue

Research results of work fatigue is a common complaint felt by porters. The statement by the Pos UKK management informant and the results of the medical records of most porters complained of muscle pain, especially the knees and lower back. This is in line with the complaints expressed by porters of porters. The way the porters work puts the load on the back with a weight of 50-70 kg for women and 80-100 for men, causing the back posture to bend and the legs to bend when walking. This position is a dangerous level posture [31]. The vertebrae are cartilaginous bones and are at risk when under heavy loads [19,20]. All of the workloads carried by informants have exceeded NAB/TLV [7] as detailed in table 2. Informants R7, R8, and R9 are informants who are in the rice and onion shopping group, the farthest away is the recommended NAB/TLV, followed by informants R10, R4, R5, and R6. The total load and the amount of time can exceed the time of observation when the market is busy. This way of working and the workload risks causing spinal cord injuries and complaints of muscle pain in parts of the body that are subjected to more stress and forced unnatural postures [19]. Muscle pain felt by porters will increase the feeling of fatigue [20,32]. The impact of fatigue that is not handled immediately will interfere with work productivity where porters will be absent more frequently and increase the risk of injury due to work accidents [14,27], sleep disturbances, and hypertension [33]. Lifting tools and proper lifting techniques are needed [12,24,31] by not overloading the sections of the body that are prone to excessive workload stress and abnormal postures [19,35]. The results of discussions with porters in the department store, where the transfer of goods is close, the use of trolleys is less effective. The transfer of goods only from one car to another can be by moving one by one sack, not being carried on the back, or employing a relay with other porters.

Other risk factors besides working methods and workload that result in fatigue are age, years of service, gender, and the dual role of female porters. The results showed informants aged 57 and 58 felt that the difference in their work abilities was significantly different than when they were young. Musculoskeletal complaints will start at the age of 35 years, complaints will continue to increase with age. The working period

of more than 20 years will have many aspects that arise from the problem of fatigue, namely productivity, the effect of mental work on physiological processes, such as pulse, respiration, and muscle strength. All porter informants had a service life of more than 20 years and all informants complained about fatigue [36]. Gender physiologically affects muscle ability, women's muscle ability is lower than that of men so that the muscle power of men is higher than that of women, male complaints are lower than that of women [37]. This is following the work of porters who transport women themselves, the lifting load and the intensity of the transportation are lower than men.

The double role of female porters who are also housewives, the informant acknowledged that household duties did not add to the burden, and it was relatively easy to do it, especially now that their children were grown, were already independent [38]. A woman who works as a porter is not an easy and natural thing, OSH Management System under the guidance of Pos UKK Puskesmas Setabelan is expected to be able to seek programs, provide suggestions, studies for improvements for porters [39].

The management of work fatigue that has not been formed and integrated with OSH Management System at Legi Market is a challenge in itself because changing the work habits and loading of porters that have been carried out for decades is not an easy matter [25]. The way porters work makes posture at a dangerous level [31] and the weight of the load far exceeds the NAB/TLV [40] causing fatigue, pain complaints, decreased productivity, and increased absenteeism [19,32], it is necessary to immediately improve and form fatigue management with porters to be target [16]. The essence of the fatigue management establishment could be like the establishment of a fatigue control organization can be taken from the head of SPTI and the chairperson of each group, the market, and Pos UKK as supervisors [41,42]. The procedure is more promotive and preventive. Training for each head of the transport porter group to become a cadre deputy, so that preventive promotive programs can be carried out in stages, from Puskesmas coaching, then porters to individual porters [30]. The control of the work environment has been running well by the Puskesmas referring to the Healthy Market [27,28].

Apart from fatigue, porters also experience work accidents, the reporting of work accidents will be recorded at the Puskesmas Setabelan if the patient comes to the Puskesmas. Pos UKK service reports are addressed to the Health Office, in the form of achievement figures such as the number of Occupational Diseases cases, the number of work

accidents, and the number of counseling in the informal sector. The reporting also does not include the achievement targets in the promotional program, preventive programs, obstacles, and suggestions that can be given to cross-programs for improvement. The recording is still lacking to analyze, such as Occupational Diseases suspected, Occupational Diseases, and work accidents which have not been separated from formal and informal Legi Market so that the source of the incident and analysis of their control cannot be studied [21,42].

Occupational safety and health organization in Legi Market

The results of the research, promotive and curative efforts at the Legi Market were carried out separately from each market party and Pos UKK because there was no K3 organization or committee in the Legi Market. Not many informal workers organizations that specifically take care of informal workers in Indonesia have been formed and are comprehensive in protecting informal workers [43]. The legislation that explicitly regulates informal workers is still lacking, how to run it, under what ministry, has not been explained in detail [44]. Pos UKK's health care facility is just an additional program, not the main program that accredited by the Puskesmas [45]. The working relationship of porters of Legi Market is as informal workers who do not have a work agreement that contains the rights and obligations of the employer and porters, so it is difficult for the Labour Law year 2003 (Undang-Undang Ketenagakerjaan Tahun 2003) to be enforced for them (porters) [43,44].

In contrast to Thailand, the law on informal workers already exists and is being championed until it is legal by the informal worker's organization HNTA. In addition to informal workers' organizations, in implementing promotions, they have an independent institution Thai Health, universities are invited to cooperate in education and training [43], for evaluation there is a survey agency NSO which provides results and challenges to policymakers [46].

The existence of limited policies and organizations of the informal sector in Indonesia does not mean that the establishment of an OSH organization in Legi Market is also impossible [47]. Organizations in implementing OSH Management System in the informal sector are important to coordinate programs, the responsibilities and roles of related parties in the implementation of OSH efforts in Legi Market can be managed as one and sustainable [43]. Based on Law No. 36/2009 concerning Health (Undang-Undang No. 36 Tahun 2009 tentang Kesehatan) determines 3

responsibilities for workplace managers, namely: 1) Complying with occupational health standards set by the Government and ensuring a healthy work environment; 2) Responsible for work accidents that occur in the work environment as per the provisions of laws and regulations; and 3) Carry out all forms of health efforts through prevention, improvement, treatment, and recovery for the workforce [48].

Based on this law, Trade Service as the manager of the Legi Market must make occupational health efforts. The Trade Office is the most authorized party in shaping policies that embrace traders' organizations, porter organizations, Pasar Legi employees, across sectors of the Health Service, and CSR to be brought together to form OSH organizations without differentiating between formal and informal workers. The Head of Market as an extension of the Trade Office should help and be responsible for facilitating the program [48]. Learning from the formation of the informal worker independent Philippine organization PATAMABA can also be applied in Legi Market [43]. Various CSR from entrepreneurs, traders and the government can be the strength of the organization. The SPTI porters organization also has its cooperative, and from the results of the interview, the chairman is also ready to help as long as he doesn't spend too much budget, which shows that he is ready to support the implementation of OSH Management System.

The first thing that needs to be done before forming an organization is to conduct a dialogue between the Trade Office, the Head of the Market, to discuss policies, agreements, and commitments to implement OSH in the Legi Market which is coordinated by the Department of Trade [41].

Actors who can become strengths in efforts to give osh protection to porters

Without the involvement of other institutional actors, the process of protecting informal workers will not be effective. With assistance from the government, OSH institutions can enter effectively into the implementation of OSH. Including informal workers' organizations in policy forums, can maintain the sustainability of the management of informal workers' health protection [41] [43]. The following are actors who can become supporting forces in the protection of OSH for porters at Legi Market:

- a. **The Trade Department (*Dinas Perdagangan*)**, as the manager and person in charge of the work health efforts of the Legi Market [48]. They have the authority to embrace all parties (the Health Department as an informal OSH institution, namely *Pos UKK*, the *SPTI* organization as informal

workers, the head/superintendent of the market, and the CSR) to implement OSH Management System for all market residents including porters. However, the results of the research show that the Trade Department does not understand their responsibilities in efforts to protect OSH for porters.

- b. **The Head/Superintendent Market Officer**, who is a state official having an office as an extension of the Trade Service in the Legi Market, can become a facilitator for the implementation of OSH in the field who is aware of the situation in the market. Becoming a proposed link between porters and *Pos UKK*, CSR, and the Trade Department.
- c. ***Pos UKK dan Puskesmas***, as services providers of promotive and preventive for informal workers, are expected to be supported and facilitated in their implementation. *Pos UKK* management in the results of the research showed high enthusiasm in implementing promotional and preventive efforts, unfortunately, the support was not maximal in infrastructure and morale support by the Market. *Pos UKK* is expected to become an actor to provide information regarding the obligations of workplace managers to carry out occupational health efforts.
- d. **The SPTI organization**, which is the association for porters of the Legi Market porters, can support it as a medium of communication and a link to porters so that it is easier and faster. The existence of informal trade unions needs to be invited to work together for the sustainability of the program [41,43].
- e. **The Various CSR Groups** as supporters and assist in facilitating supporting infrastructure, depending on the market, especially the head of the market, to direct the form of assistance [49].

National health insurance membership

The porters have difficulty registering for insurance because they are unable to read and write, do not know how to register, and prefer to work over holidays to administer BPJS [50]. The BPJS Kesehatan system is considered troublesome when it cannot be used outside of the residence. Meanwhile, most porters live outside the city of Surakarta. Only given 3 chances after that to pay [51]. Another difficulty is that the diagnosis of occupational diseases have to base on a certificate from a specialist who competent in of occupational health. For porters who check complaints of fatigue or muscle pain to the Puskesmas or the *Pos UKK* service, these cases are included in general illnesses, not occupational diseases, so insurance claims are with BPJS Kesehatan. The porters need to have both kind insurances (BPJS

Kesehatan and BPJS Ketenagakerjaan/Health and Occupational Insurance) if they want easy claims, which causing of there will be more insurance fees, which is burdensome for some of the current porters [52].

Porters still need to be encouraged to become participants in BPJS Kesehatan and BPJS Ketenagakerjaan because it is mandatory as their health and occupational safety insurance. The market parties need to ask BPJS Department for more maximally persuasive promotions, for example directly visiting or face to face, such as with Mobile Customer Service (MCS), with MCS porters can get information and can immediately register even though their domicile is different. The action of the Madiun City (another city in Indonesia beside Surakarta) government which has provided free BPJS Ketenagakerjaan to 3,763 informal workers in Madiun City [1,53] needs to be emulated and used as motivation for all city governments, especially the Surakarta City Government.

The challenges of implementing OSH management system and occupational fatigue for informal sector

There are several obstacles to implementing OSH Management System and Occupational Fatigue, as follows:

There is no OSH policy and organization in the Legi Market embraces related parties so that fatigue management involves the porters association, market parties, and *Pos UKK* not yet formed. As a result of the absence of an organization, the current efforts are also running independently, not being coordinated into one, so that the goal is not focused and focused on the real problem [43]. Increasing the involvement of workers in *Pos UKK* is an impetus for the sustainability of the program [42]. Differences in support from the head of the market, because it is held by different people (due to job position rotation). There have been no technical guidelines or job descriptions that unify voices, in to support occupational health efforts programs, even the head market is changed [21,41]. The Indonesian Transport Workers Union (SPTI), which is an association of porters, is not brave enough when it wants to propose something, especially the problem of health programs if there is no invitation from the relevant government such as the Trade Department [30]. Lack of competence and knowledge of Human Resources (*Pos UKK* cadre) in the field of OSH. This is because there is no training related OSH for them. The impact of promotive and preventive programs on risk assessment, ergonomics, and occupational health for fatigue control has not been provided widely [30].

Kurangnya antusias kuli angkut terhadap kegiatan terkait kesehatan. Lack of porters' enthusiasm to activities related health program. Porters do not understand the benefits of health program activities and have not been recruited to participate in the program [42].

Procurement of lifting tools such as trolleys so that loads are no longer placed on the back [12,31], as well as promoting the correct lift-transport technique [21,34]. The procurement of trolley tools can be obtained from CSR. Their assistance can be directed towards long-term interests through proposals submitted by the market [49]. Related parties such as the *Puskesmas* Setabelan, the Health Department, the Market Office, the Trade Department, and *SPTI* need to sit down together to make a policy or collective agreement so that they are willing to help each other in OSH programs in striving for the maximum possible occupational health for all workers who worked at Pasar Legi [41]. With this policy or agreement, it is expected that all related parties feel responsible, even though government positions are held by different people, the support should be the same, all parties are embraced, if one party lacks funds, the other can seek assistance, and the OSH Management System organization and fatigue management can be easier formed.

Education and training related to OSH for *Pos UKK* administrators by *Puskesmas* Setabelan. *Pos UKK* managers who are competent in OSH can pass on their competence on OSH to the market and porters. So that there is a tiered delivery of information [25,30]. Maximizing the function of *Pos UKK* as a promotive and preventive service by establishing fatigue management as control over occupational fatigue [22,27]. It could be with the formation of long-term programs [16,25].

Currently, *Pos UKK* as the one and only of occupational health services for informal porters in Legi Market has not become the main program from the government. However, considering the impact of fatigue and the role of porters as manual lifting transporters which can reach hundreds of tons per day, it is certainly necessary to seek optimal occupational health for them, with good cooperation and assistance from all related parties [8,41,48,54].

CONCLUSION

Promotive and preventive efforts have not yet led to reducing the risk of fatigue. The Trade Department as the manager of the Legi Market is responsible for occupational health efforts, especially for porters at the

Legi Market. Occupational fatigue is a common complaint (mild fatigue to the whole body, muscle pain especially in the knees and lower back, and decreased productivity) for porters of Legi Market. Occurs in all informant porters, with service life of 21-41 years and aged 42-58 years, with bent work postures and bent legs; workload exceeds NAB/TLV.

Challenges in implementing OSH Management System, especially promotive and preventive efforts in controlling work fatigue, are: a) The unavailability of lifting tools; b) The *SPTI* porters' organization has not been joined in the implementation of OSH Management System; c) Limited capacity and responsibility of the market for the implementation of OSH Management System; d) Different support from superintendent market for implementing OSH programs, during job rotation; e) The *SPTI* as porters' organization does not have the authority to manage improvements of OSH for porters; f) The operational funds for the *Pos UKK Puskesmas* Setabelan are limited; g) *Pos UKK* cadres lack of OSH competence and knowledge; h) Lack of enthusiasm of porters for activities related to health program and BPJS membership.

Suggestion for Trade Department and Legi Market: a) Immediately provide a lifting tools such as a trolley; b) Conduct discussions with related parties to create OSH Policy and Organization; c) Establish management fatigue, which is integrated with the existing OSH Management System implementation; d) Conduct health and occupational insurance socialization by directly face to face to person and presenting Mobile Customer Service (MCS) to the Legi Market.

Suggestion for *Puskesmas* dan *Pos UKK*: a) Education and training of OSH for *Pos UKK* cadres; b) Maximizing the function of *Pos UKK* as a service for promotive and preventive efforts to porters to minimize the risk of occupational fatigue; c) Engage the porters association to become actors and targets for the implementation of *Pos UKK*. Suggestion for the *SPTI* Organization, contribute and participate in health programs that held by Legi Market.

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