Jurnal Kesehatan Ibu dan Anak
Vol.17, No.2, November 2023, pp. 28~39
10.29238/kia.v17i2.2026

ISSN: 2599-3224 (Online)
ISSN: 2302-6014 (Print)

Work Related to Reproductive Health Risk Analysis for Female Healthcare Workers

Dian Herawati[1], Shofiyah Arviana Rahmawati[2]
[1] Department of Information and Medical Service, Gadjah Mada University, Yogyakarta, Indonesia, dian.herawati@ugm.ac.id
[2] Department of Information and Medical Service, Gadjah Mada University, Yogyakarta, Indonesia, shofiyah.arviana@mail.ugm.ac.id

ARTICLE INFO

Article history:

Received November 17th, 2023
Revised November 23rd, 2023
Accepted November 30th, 2023

Keyword:

agent, exposure, disorder, health, occupational, reproductive

ABSTRACT

Female workers have a risk of being exposed to various hazards in the work environment which can cause health problems including of reproductive health. Female health workers who work in hospitals certainly have a greater risk of exposure to disease in the workplace. This study aims to analyze work related to reproductive health risk of female healthcare workers at the hospital. This type of research is quantitative with the path analysis approach method. The research was conducted at the Gadjah Mada University Academic Hospital from April to November 2022. This study aims to analyze work related to reproductive health risk of female healthcare workers at the hospital. This type of research is quantitative with the path analysis approach method. The research was conducted at the Gadjah Mada University Academic Hospital from April to November 2022. The results showed that the contribution of type of job, agent exposure, and work shift was 71.9%. The value of the direct influence of type of job is 0.105, agent exposure is 0.392, and the work shift is 0.223 on pregnancy disorders (pvalue<0.05). Agent exposure and work shift had a direct effect, while type of job had no direct effect because the direct influence value was lower than the indirect influence (0.11 < 0.21). The conclusion is the need for special attention and policies for female workers during menstruation and work shift arrangements as reproductive health risk factors to prevent pregnancy disorders.

This is an open access article under the CC–BY-SA license.

Corresponding Author:

Dian Herawati
Universitas Gadjah Mada
Email: dian.herawati@ugm.ac.id

INTRODUCTION

Female workers are certainly part of the mother, who can get pregnant, give birth and breastfeed their children. Female workers are very sensitive to some hazards in workplace environment[1]. Female workers have different abilities and physiology than men, because they are more sensitive to exposure to the hazards mentioned above, especially over long periods of exposure[2].

Female health workers who work in hospitals certainly have a greater risk of exposure to disease in the workplace. Female workers have a risk of being exposed to various hazards in the work environment which can cause health problems for the fetus and the working mother herself[1,3]. Hospitals are included in the criteria for workplaces with various threats of danger that can have health impacts, including the danger of infection with the Covid-19 virus [4].

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

Chemical and physical are found to be the predominant factors greatly influencing women workers. Most studies showed menstrual and cycle disorders, and risky pregnancy as key Sexual and Reproductive Health issues. Menstruation disorder was considerably linked with psychological and organisational factors[5]. Risk factors for the reproductive health of female health workers in hospitals include physical hazards (radiation, temperature, vibration, noise), chemical (anesthesia gas, chemotherapy agents, ethylene oxide, drugs, and solvents), psychological (work hours, shifts night), biology (viruses, bacteria, other microorganisms), and ergonomics (moving, lifting, pushing patients)[6].

Indonesia has policy to protect female workers such as on the first and second days of menstruation, pregnancy, prenatal and postnatal leave, and the prohibition to work at night and more than 40 hours a week [7]. Even so, not all workers have rights according to these regulations so that there are still many potential hazards faced by female workers which are risk factors for their health including reproductive health [8].

The effect of exposure to reproductive hazards in the workplace is a contribution to the cause of maternal and child mortality, where Indonesia is still far from the targeted SDGs in 2030, 70 per 100,000 live births and an infant mortality rate of 12 per 1000 births life[3]. Meanwhile, excessive workload affects the physical and mental health of female workers. This means that female workers need to receive protection during menstruation, pregnancy, and breastfeeding because there are disturbances inherent in female during this period of their lives[9].

The effects of occupational hazard exposure can cause reproductive health problems, including menstrual disorders, early menopause, ovarian dysfunction, decreased fertility and problems during pregnancy, and adverse effects on the baby being born. Exposure to reproductive hazards to the mother during pregnancy can interfere with fetal development. Exposure to hazards at work can have an impact on intrauterine growth retardation (IUGR), fetal death (IUFD), infant mortality, birth defects, premature births, disturbances in cognitive development and immunological function, reduced time for breastfeeding and caring for children[10,11].

In fact, female health workers do not yet receive regular general check-up facilities, there are no laboratory examination facilities such as Cytomegalovirus (CMV) or pap smears, contract workers don't get paid maternity leave permits, and female health workers still get more night shifts than health workers man.

There is a gap between reality and what is experienced by female workers so these is a potential problems, the authors are interested in conducting research to analyze work related to reproductive health risk of female healthcare workers at the hospital and their impact on female reproductive health workers at the Gadjah Mada University Academic Hospital. Studies on reproductive health disorders due to hazard exposure at hospital have never been carried out, so it is necessary to conduct studies on risk in the workplace related to the reproductive health of female health workers.

METHOD

This type of research is a quantitative study with a path analysis approach method in which reproductive health disorders (menstrual disorders and pregnancy disorders) are the dependent variable. Meanwhile, workplace hazards such as type of job or profession, work shift and agent exposure are independent variables. The research was conducted at the Gadjah Mada University Academic Hospital from April to November 2022. The number of research samples was 71 respondents obtained by stratified random sampling for respondents worked shifts and non-shifts. The sampling technique uses stratified random sampling from several hospital units or installations. This research was conducted through interviews, questionnaires, documentation studies, and field observations.

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

Research subjects were female's health workers consisting of doctors, midwives, nurses, radiologists, physiotherapists, medical record officers, pharmacists, and nutritionists. Research subject inclusion criteria include: 1. female's health workers who work at the Gadjah Mada University Academic Hospital; 2. respondents are willing to participate in the study. While the exclusion criteria include: 1. Respondents did not fill out the questionnaire; 2. Respondents canceled their willingness to become research respondents.

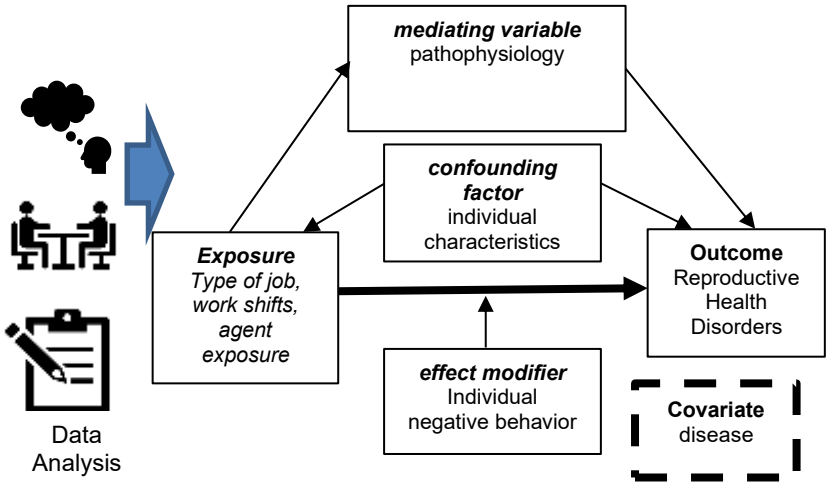

Figure 1. Research Design

The data collected in this study includes primary data. Primary data was collected by conducting interviews and questionnaires to determine individual characteristics, other factors as biomarkers, reproductive health disorders, and field observations. The main analysis carried out was to test the path construct whether it was tested empirically or not. Subsequent analyzes were carried out to look for direct and indirect effects using correlation and regression so that it can be seen that to arrive at the final dependent variable, one has to go through direct paths or through intervening variables. The research was carried out after obtaining ethical approval with number e-KEPK/POLKESYO/0599/VI/2022 and a research permit from the Gadjah Mada University Academic Hospital.

RESULTS

Characteristics of Respondents

Research on the work related to reproductive health risk analysis for female healthcare workers at the Gadjah Mada University Academic Hospital was attended by 71 respondents with the following characteristics can be seen from Table 1.

Table 1. Characteristics of Respondents

Characteristics of Respondents		Frequency	Percentage (%)
Type of job	Nurse	15	21
	Non-Nurse	56	79
Age	20-35 tahun	61	86
	>35 tahun	10	14
Menarche	Normal	68	96
	Menarche tarda	3	4
Parity	Nullipara	35	49
	Primipara	16	23
	Multipara	20	28

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

The results of the study showed that most of the respondents worked as non-nurse medical personnel, aged 20-35 years, and most of them were nullipara. For menarche age is 96 percent at normal age (10-14 years).

Identification reproductive health risk of female workers in hospital

Identification reproductive health risk of female workers in hospital include shift of work and agent exposure can be seen at Table 2.

Table 2. Reproductive Health Risk of Female Workers in Hospital

Reproductive Health Risk		Frequency	Percentage (%)
Work shift	Yes	40	56
	No	31	44
Night shift	≤ 2 per week	33	83
	≥ 3 per week	7	17
Working hours (per week)	20-60 hours	65	92
	> 60 hours	6	8
Agent exposure			
a. Chemical hazard (dust, smoke, irritant agent, infectious agent)	Yes	46	65
	No	25	35
b. Biological hazard (blood, bacteria, virus)	Yes	48	68
	No	23	32
c. Radiation	Yes	27	38
	No	44	62

Based on the results of the study, as many as 56 percent of respondents get work shifts, with most of them getting night shift tasks a maximum of 2 times per week, although there are still those who get a night shift schedule more than 3 times per week. The majority or 65 percent of respondents get working hours under 60 hours in a week.

The exposure to agents at the work site can be classified as chemical hazards in the form of dust, smoke, irritant agents, infectious agents where 65 percent of respondents are exposed to these chemical hazards, then biological hazards can be caused by blood, bacteria, and viruses where 68 percent of respondents are exposed to these biological hazards. For radiation hazards, 38 percent of respondents were exposed to radiation due to activities using computers and medical devices that emit radiation.

Identification of reproductive health problems experienced by female health workers

Reproductive health problems experienced before, during and after pregnancy such as heavy or irregular menstrual bleeding, premenstrual syndrome, dysmenorrhea and menstrual cycle disorders and abortion, premature delivery and giving birth to low birth weight babies in female health workers in Gadjah Mada University Academic Hospital can be seen at Table 3.

Table 3. Reproductive Health Problems Experienced by Female Health Workers in Hospital

Reproductive Health Problem		Frequency	Percentage (%)
Menstrual disorder	Yes	33	46
	No	38	54
include:			
a. Hypermenorrhea	Yes	3	9
	No	30	91
b. Premenstrual syndrome	Yes	10	30
	No	23	70
	Yes	3	9

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

c. Irregular bleeding outside the menstrual cycle	No	30	91
d. Dysmenorrhea	Yes	24	73
	No	9	27
e. Menstrual cycle disorders	Yes	11	33
	No	20	67
Pregnancy disorder	Yes	14	39
	No	22	61
include:			
a. Abortion	Yes	5	36
	No	9	64
b. Preeklampsia	Yes	1	7
	No	13	93
c. Premature rupture of membranes	Yes	5	36
	No	9	64
d. Fetal pregnancy with IUGR	Yes	4	29
	No	10	71
e. Fetal pregnancy with immature/premature	Yes	1	7
	No	13	93

The results of the study showed that 54 percent of female health workers at the Gadjah Mada University Academic Hospital did not experience menstrual disorders. Meanwhile, 33 people who experienced menstrual disorders included hypermenorrhea, premenstrual syndrome, irregular bleeding outside the menstrual cycle, dysmenorrhea, and menstrual cycle disorders. The results of the study also showed that of the 36 women who had given birth, 14 of them had abortion, preeclampsia, premature rupture of membranes, fetal pregnancy with IUGR, and fetal pregnancy with immature or premature. As for the 71 respondents, the following is the number of health conditions that experienced menstrual disorders and pregnancy disorders, which can be seen in Table 4.

Table 4. Prevalence of Menstrual and Pregnancy Disorders by Occupation

Disorder	**Type of Job**		**Frequency**	**Percentage (%)**
Menstrual disorder	Pharmacists	Yes	3	50
		No	3	50
	Nutritionists	Yes	4	67
		No	2	33
	Nurse	Yes	8	53
		No	7	47
	Doctor	Yes	4	57
		No	3	43
	Midwives	Yes	8	40
		No	12	60
	Radiologists	Yes	1	50
		No	1	50
	Physiotherapists	Yes	3	50
		No	3	50
	Medical Record Officers	Yes	1	17
		No	5	83
Pregnancy disorder	Pharmacists	Yes	2	50
		No	2	50
	Nutritionists	Yes	2	40
		No	3	60
	Nurse	Yes	4	67
		No	2	33
	Doctor	Yes	1	33
		No	2	67

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

Midwives	Yes	2	15
	No	11	85
Radiologists	Yes	0	0
	No	2	100
Physiotherapists	Yes	3	60
	No	2	40
Medical Record Officers	Yes	0	0
	No	1	100

Based on Table 4, it is shown that menstrual disorders are most commonly experienced by the nurse and maternal perinatal with 8 respondents each. These results indicated a relatively high prevalence of the condition among other occupation. Meanwhile, in pregnancy disorders, 67 percent are experienced most by the nurse.

Identification of occupational reproductive hazard and its impact on reproductive health problems

The results of the test with a regression model to see the influence of independent variables or exposure to reproductive harm, namely type of job, agent exposure, and work shift through intermediate variables, namely menstrual disorders, on the results, namely pregnancy disorders, can be seen in Figure 2.

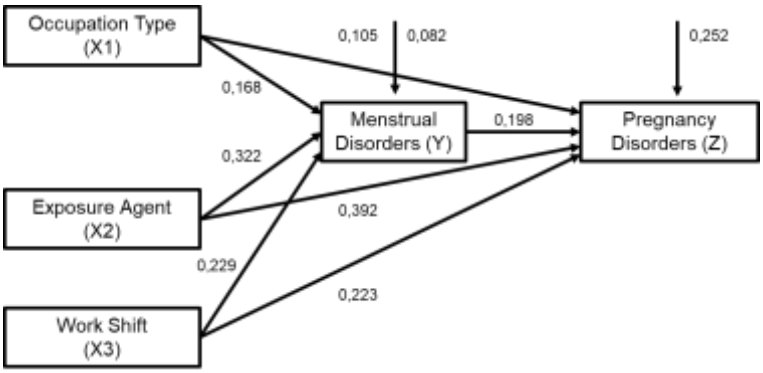

Figure 2. Model Regression

Based on the results of the regression model, it was found that type of job had no direct effect on pregnancy disorders as seen from the results of the calculation of the direct influence value (0.011) < indirect influence (0.021). The variable of agent exposure has a direct effect on pregnancy disorders as seen from the results of the calculation of the value of direct influence (0.154) > indirect influence (0.078). The work shift variable has a direct effect on pregnancy disorders as seen from the results of the calculation of the direct influence value (0.050) > indirect influence (0.044). The variables type of job, agent exposure, and work shift contributed 71.9 percent to the variable of pregnancy disorder (Z) as shown by the results of the determination coefficient of 0.719. Meanwhile, the remaining 28.1 percent is the contribution of other variables that were not studied.

DISCUSSION

Based on the results of the study showed that the most type of work most respondents experiencing menstrual disorders are nurses. This is in accordance with research that results demonstrated that 41% of nurses experienced menstrual disorders. They found handling disinfectants was the most significant risk factor for menstrual disorders, followed by abnormal workload and occupation as a nurse. Noise, prolonged standing or frequent heavy lifting, night work, anti-cancer drug exposure, and overtime work were moderately associated with the occurrence of menstrual disorder (OR > 1) [12]. The

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

other research also shows that the prevalence of dysmenorrhea was high among the nursing staff of a tertiary care centre which was similar to the findings of other studies done in similar settings [13].

The results of the study showed that the agents most frequently exposed to female health workers were biological agents and chemical hazard. This is in accordance with research that found handling disinfectants was the most significant risk factor for menstrual disorders (OR = 1.53, 95% CI: 1.39–1.68) in the female nurses[12]. The use of chemicals in the form of toxic hazardous materials is produced by almost all hospital installations. The hazard in the form of toxic hazardous material waste comes from distribution, procurement and patient services. In health care, workers have opportunity for exposure to biological hazards when caring for patients, conducting laboratory tests, or cleaning patient rooms and linens. The route of exposure for biological agents includes both direct contact and airborne or aerosolized droplets. With the exception of mumps virus. infectious diseases and biological agents are not known to cause fertility problems. In pregnancy, however, depending on the trimester, exposures to TORCH infections toxoplasmosis, other agents. rubella, cytomegalovirus and herpes simplex threaten fetal well being and pregnancy viability. Toxoplasmosis is a greater risk although patienta with advanced AIDS may acquire toxoplasmosis primarily as a lung infection. The other agents include hepatitis B, Coxsackie virus, syphilis, varicella-zoster virus, HIV, and human parvovirus B19. As a group, they cause low birth weight (i.e., 2,500 grams or less), childhood cancers, congenital defects, premature deliveries, psychomotor retardation, chronic infection through vertical transmission (i.e., maternal-neonate transmission via blood exposure during birth), and miscarriage or fetal death along with significant maternal morbidity[4].

Most of the toxic hazardous material waste comes from pharmaceutical warehouses. The risk control effort that has been carried out by the Gadjah Mada University Academic Hospital is the provision of a Material Safety Data Sheet (MSDS) for the use of chemicals including toxic hazardous material which is updated every year. Risk control in terms of administration includes training on spill kits to deal with toxic hazardous material spills which are carried out routinely every year. If workers or visitors to the hospital are exposed to toxic hazardous material waste, first aid is given by officers at the emergency room. The recommended risk control is the periodic provision of OHS training to workers, conducting routine health checks at least once every three months[14]. A huge number of chemicals are produced and used in the world, and some of them can have negative effects on the reproductive health of workers. To date, most chemicals and work environments have not been studied for their potential to have damaging effects on the workers reproductive system[15].

Hazard identification in each workplace by OHS officers at Gadjah Mada University Academic Hospital is carried out every 6 months. This activity was carried out together with the hospital quality committee. The OHS unit of Gadjah Mada University Academic Hospital was also involved from both the OHS hospital's central and the OHS in each unit. Efforts to control OHS risk in increasing the competence of hospital workers by conducting training or outreach to employees to work safety. The hospital, especially the hospital OHS unit, conducts training related to fire, infection prevention and control, basic life assistance, excellent service, disaster evacuation, and code blue. In conducting the mapping of training and education is done once every year. For new employees and students when they enter for the first time, they will be given a safety induction to provide information about an overview of activities or work in the hospital and the hazards that exist and the risks posed if risk control is not carried out. Industrial hygiene measurements are carried out routinely by the sanitation unit every month. The hospital has implemented a smoke-free area in accordance with the regulations of the governor of the special region of Yogyakarta. Every year the OHS unit routinely evaluates workplace hazards for the safety and health of its

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

employees. Anticipating risks is a crucial first step to effectively managing them and to building a preventative OSH culture in an ever changing world. Practices to do this include forecasting, technology assessments and future studies, which enable the identification of potential work-related safety and health risks and the development of effective preventative actions[16].

Based on the results of the study showed that most of respondents got work shift with most getting night shift assignments. Despite having the opportunity to sleep during the night shifthowever, after carrying out night guard duties almost all respondents did not replace sleep breaks during the day. Female workers who worked in the evening and at night shift had high risks of pregnancy disorders and miscarriage than female workers who worked at normal working hours. Working in shifts and the irregular working hours also associated with the miscarriage occurrence[3].

Shift work and irregular work schedules could lead to a change in the circadian rhythm, which affects regulation of the ovulatory cycle with resultant menstrual irregularities. A meta-analysis has shown physically demanding work to be significantly associated with pre-term birth. Other occupational exposures significantly associated included prolonged standing, shift and night work, and a high cumulative work fatigue score. Risk of pregnancy loss has been observed to be higher among women with a fixed evening work schedule in comparison with women with a fixed day schedule, and twice as high among those on a fixed night schedule. The highest abortion rate has also been seen in workers who reported irregular working hours and rotating shifts[11]. Working fixed nights was associated with a moderately increased risk of miscarriage pooled RR 1.51, 95% confidence interval 1.27-1.78[11,17].

The results of the study showed that 54 percent of female health workers at the Gadjah Mada University Academic Hospital did not experience menstrual disorders. Meanwhile, 33 people who experienced menstrual disorders included hypermenorrhea, premenstrual syndrome, irregular bleeding outside the menstrual cycle, dysmenorrhea, and menstrual cycle disorders.This is in accordance with research that showed prevalence of dysmenorrhea was 59%, abnormal amount of menstrual bleeding 48.7%, abnormal menstrual duration 32%, and abnormal menstrual cycle length 154 30.6% in 503 participants. Dysmenorrhea risk was 0.79-fold (95% CI = 0.64-0.83) lower in those with advanced age and 1.56-fold (95% CI = 1.02-2.37) higher in smokers; risk of abnormal amount of menstrual bleeding was 3.91-fold (95% CI = 1.24-12.30) higher in those with total employment time of ≥ 20 years and 1.56-fold (95% CI = 1.07-2.26) higher in those who worked with display screens for > 20 hours a week; risk of abnormal menstrual cycle length was 3.46-fold (95% CI = 1.41-8.43) higher in technicians, 2.86-fold (95% CI = 1.24-6.61) higher in nurses, 2.63-fold (95% CI = 1.19-5.79) higher in other healthcare workers, and 2.14-fold (95% CI = 1.42-3.21) higher in those who were unsatisfied with their job [18].

The results showed that of the 36 female healthcare workers at Gadjah Mada University Academic Hospital who had given birth, 39 percent experienced pregnancy disorders, including abortion, premature rupture of membranes, IUGR, preeclampsia, and bleeding during pregnancy. Maternal and Child Health (MCH) service for female worker from before the pregnancy until the first day of a child's life needs to be done because of so many risks that the worker will face. The study was conducted on female workers in industrial area 31.7% of female workers experienced pregnancy disorders[19]. The health care sector carries risk for all three types of reproductive hazards. Numerous occupations. ranging from laboratory and pharmaceutical positions to dentists. physicians. nurses, allied health and public health professionals. and veterinarians, exist within the health care sector[4]. The effect of hazardous workplace for female workers in this study like the other research that showed about 40.4% of the studied group reported a problem in conceiving a

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

child, and 38% had a history of miscarriage, preterm, stillbirth, or deformed offspring. Miscarriage was the highest reported abnormal obstetric outcome among married participants (22.5%) [20].

Occupational exposures to workplace hazards in health-care workers can affect on their health including the reproductive system. Some exposures cause reproductive system disorders. Frequency of menstrual disorders in clinical personnel especially, personnel of emergency departments were the highest. The odds ratio for menstrual disorders in clinical personnel was 1.362 (1.008-1.84)[21]. Some studies, however, have not reported higher risks, and employed women sometimes have been observed to have fewer previous miscarriages or perinatal deaths when compared with housewives. Also, the higher rate of previous miscarriages among working women than non working women, observed in one study, had disappeared when adjusted for parity. The risk of employment on delivering a low birth weight infant[11].

Based on the results of the regression model, it was found that type of job had no direct effect on pregnancy disorders as seen from the results of the calculation of the direct influence value (0.011) < indirect influence (0.021). The variable of agent exposure has a direct effect on pregnancy disorders as seen from the results of the calculation of the value of direct influence (0.154) > indirect influence (0.078). The work shift variable has a direct effect on pregnancy disorders as seen from the results of the calculation of the direct influence value (0.050) > indirect influence (0.044). The variables type of job, agent exposure, and work shift contributed 71.9 percent to the variable of pregnancy disorder (Z) as shown by the results of the determination coefficient of 0.719. Meanwhile, the remaining 28.1 percent is the contribution of other variables that were not studied. Variation in menstrual cycle length may be a risk marker of gestational diabetes/impaired glucose, lower birth size, and preterm birth and flag women who may benefit from targeted monitoring and care before and during pregnancy[22]. The result shows that similar with previous study that the moderation effect of job control on the relationship between workload and exhaustion[23]. The result according to the research that biological and chemical agents cause low birth weight, congenital defects, premature deliveries, psychomotor retardation, chronic infection through vertical transmission (i.e., maternal-neonate transmission via blood exposure during birth), and miscarriage or fetal death along with significant maternal morbidity[4]. The result according to the previous study that The results of logistic regression test showed that reproductive health during pregnancy was affected by shift work (p=0.007)[3].

Pregnancy-related hypertensive disorders usually affect women with painful or irregular menstrual cycles, perhaps due to metabolic syndrome or molecular pathways involving vasoactive substances, with clear vascular implications. Pregnancy-related hypertensive disorders (PRHDs) are a leading cause of maternal and perinatal morbidity and mortality. By monovariate analysis, PRHDs correlated with dysmenorrhoea, hypermenorrhoea and menstrual irregularity ($p < 0.05$). By multivariate analysis, the occurrence of PRHDs was influenced by dysmenorrhoea and menstrual irregularity ($p < 0.05$). PRHDs usually affect women with painful or irregular menstrual cycles, perhaps due to metabolic syndrome or molecular pathways involving vasoactive substances, with clear vascular implications[24]. Specific exposures such as rotating shift work, pesticide exposure, racism, and stress can have biological effects on menstrual patterns[25].

The criteria for employee status at Gadjah Mada University Academic Hospital consist of civil servants, permanent employees, honorary employees, contract employees, and freelance workers. Hospital policy regarding leave during pregnancy, for employees with civil servant status, they are entitled to 3 months of maternity leave, while non civil servants employees are entitled to 2 months of maternity leave. Maternity leave does not apply to honorary, contract, or casual daily workers. For pregnant workers there is no hospital policy in facilitating pregnancy checks, unless it is carried out internally by officers

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

on a family basis. Pregnancy checks are returned according to the first level health facility of each worker. Gadjah Mada University Academic Hospital provides psychology consultation facilities for hospital employees who need these facilities. The Maternal and Child Health service that have been received are good enough but the health promotion and provision of MCH service should be done in the company[19].

The medical check up (MCU) facility is not the same for each installation or unit at Gadjah Mada University Academic Hospital. The MCU time criteria for each unit depend on hazard exposure in the workplace. In units with high hazard exposure criteria, MCU is carried out every 3 months. Units identified as having high hazard issues such as radiology units and oncology units. Meanwhile, other units are carried out by the MCU once a year. The recommended risk control is the periodic provision of OHS training to workers, conducting routine health checks at least once every three months[14].

Related to hospital policies for workers who experience reproductive health problems, especially menstrual disorders and pregnancy disorders, there is currently no policy to provide special leave for workers during the menstrual period. Recommended risk controls are periodic provision of OHS training to workers, conducting routine health checks at least once every three months, safety talk, installing OHS signs, monitoring adherence to the use of PPE for each worker.

The weakness of this study is this only provides exposure and tests the relationship without providing recommendations for overcoming problems. Apart from that, the method used only uses one measuring instrument, namely a questionnaire without using other measuring instruments.

CONCLUSION

Type of works, agents exposure, and work shift in the workplace are risk factors for the reproductive health of female health workers in hospitals that can interfere with pregnancy. The results of the study showed that almost 50 percent of female health workers at the Gadjah Mada University Academic Hospital had experienced menstrual disorders and 39 percent had experienced pregnancy disorders. The value of the direct influence of type of job is 0.105, agent exposure is 0.392, and the work shift is 0.223 on pregnancy disorders (pvalue<0.05). Agent exposure and work shift had a direct effect, while type of job had no direct effect because the direct influence value was lower than the indirect influence (0.11 < 0.21). The result shows that we need special policies for female health workers during menstruation and work shift arrangements to prevent the onset of pregnancy disorders.

ACKNOWLEDGEMENTS

Thank you to Gadjah Mada University for providing research grant funding from community funds so that this research was carried out.

REFERENCES

1. Rahman FS, Martiana T. Analysis of factors related to maternal health in female workers in the industrial area of Sidoarjo, Indonesia. *J Public Health Afr*. 2019;10(S1). doi:10.4081/jphia.2019.1179
2. Biswas A, Harbin S, Irvin E, et al. Sex and Gender Differences in Occupational Hazard Exposures: a Scoping Review of the Recent Literature. *Curr Environ Health Rep*. 2021;8(4):267-280. doi:10.1007/s40572-021-00330-8
3. Martiana T, Rahman FS, Mahdang P, Rahmawati T, Jalaludin J. *The Influence of Work Factors on Reproductive Health of Female Workers in Sidoarjo Industrial Area, Indonesia*. Vol 15.; 2019.

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

4. Gonzalez C. Occupational reproductive health and pregnancy hazards confronting health care workers. *AAOHN Journal*. 2011;59(9):373-376. doi:10.3928/08910162-20110825-04
5. Razafimahefa RH, Pardosi JF, Sav A. Occupational Factors Affecting Women Workers' Sexual and Reproductive Health Outcomes in Oil, Gas, and Mining Industry: A Scoping Review. *Public Health Rev*. 2022;43. doi:10.3389/phrs.2022.1604653
6. University of Toronto. *Workplace Screening Tool for Pregnant Workers*.; 2023.
7. *Undang-Undang Republik Indonesia Nomor 13 Tahun 2003*.
8. Bonzini M, Coggon D, Godfrey K, Inskip H, Crozier S, Palmer KT. Occupational physical activities, working hours and outcome of pregnancy: Findings from the Southampton Women's Survey. *Occup Environ Med*. 2009;66(10):685-690. doi:10.1136/oem.2008.043935
9. Rahman FS, Martiana T. Workplace hazard and its effect on pregnancy disorders in female workers at the industrial area of sidoarjo. *Journal of Health and Translational Medicine*. 2020;23:19-25.
10. Vos T, Abajobir AA, Abate KH, et al. Global, regional, and national incidence, prevalence, and years lived with disability for 328 diseases and injuries for 195 countries, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*. 2017;390(10100):1211-1259. doi:10.1016/S0140-6736(17)32154-2
11. Banerjee B. *Physical Hazards in Employment and Pregnancy Outcome*.; 2009.
12. Jiang Z, Wang J, Guo X, et al. Menstrual disorders and occupational exposures among female nurses: A nationwide cross-sectional study. *Int J Nurs Stud*. 2019;95:49-55. doi:10.1016/j.ijnurstu.2019.04.010
13. Pokhrel M, Thapa M. Dysmenorrhea among nursing staff in a tertiary care center: A descriptive cross-sectional study. *Journal of the Nepal Medical Association*. 2021;59(240):760-762. doi:10.31729/jnma.6976
14. Aini NS, Fatimah R, Fathimah A. Identifikasi Bahaya dengan Metode Hazard Identification, Risk Assesment and Risk Control (HIRARC) Bagian Produksi Stay Mirror di PT. Argatama Multi Agung 2021. 2022;5(4):336-347. doi:10.32832/pro
15. Rim KT. Reproductive Toxic Chemicals at Work and Efforts to Protect Workers' Health: A Literature Review. *Saf Health Work*. 2017;8(2):143-150. doi:10.1016/j.shaw.2017.04.003
16. *Safety And Health At The Heart Of The Future Of Work Building on 100 Years of Experience*.
17. Thompson BJ, Stock MS, Banuelas VK, Akalonu CC. The impact of a rigorous multiple work shift schedule and day versus night shift work on reaction time and balance performance in female nurses: A repeated measures study. *J Occup Environ Med*. 2016;58(7):737-743. doi:10.1097/JOM.0000000000000766
18. GÜNGÖRDÜ N, KURTUL S. Association between self-reported menstrual disorders and occupational exposures in female healthcare workers: a university hospital experience from Turkey. *The European Research Journal*. 2023;9(4):800-810. doi:10.18621/eurj.1186212
19. Martiana T, Rochmah TN, Alayyannur PA, Rahman FS. Characteristics of the maternal and child health service of female workers with maternal and child health status in

Jurnal Kesehatan Ibu dan Anak Vol.17, No.2, July 2017, pp. 28~39
ISSN: 2599-3224 (Online), ISSN: 2302-6014 (Print)

Indonesia. *Indian J Public Health Res Dev*. 2019;10(5):1499-1503. doi:10.5958/0976-5506.2019.01148.3

20. M Z, R A. OCCUPATIONAL REPRODUCTIVE HEALTH HAZARDS AMONG UNIVERSITY WORKING FEMALES. *Egypt J Occup Med*. 2022;46(1):123-140. doi:10.21608/ejom.2021.87485.1244
21. Assadi SN. *Is Being a Health-Care Worker a Risk Factor for Women's Reproductive System?* Vol 4.; 2013. www.ijpm.inwww.ijpm.ir
22. Soria-Contreras DC, Perng W, Rifas-Shiman SL, Hivert MF, Chavarro JE, Oken E. Menstrual cycle length and adverse pregnancy outcomes among women in Project Viva. *Paediatr Perinat Epidemiol*. 2022;36(3):347-355. doi:10.1111/ppe.12866
23. Portoghese I, Galletta M, Coppola RC, Finco G, Campagna M. Burnout and workload among health care workers: The moderating role of job control. *Saf Health Work*. 2014;5(3):152-157. doi:10.1016/j.shaw.2014.05.004
24. Fruscalzo A, Bertozzi S, Londero AP, et al. Menstrual abnormalities and predisposition to pregnancy-related hypertensive disorders: A retrospective study. *Gynecological Endocrinology*. 2010;26(6):445-450. doi:10.3109/09513591003632092
25. Engmann L, Jin S, Sun F, et al. Racial and ethnic differences in the polycystic ovary syndrome metabolic phenotype. In: *American Journal of Obstetrics and Gynecology*. Vol 216. Mosby Inc.; 2017:493.e1-493.e13. doi:10.1016/j.ajog.2017.01.003