LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU PEER REVIEW
KARYA ILMIAH: JURNAL ILMIAH

Judul Artikel Ilmiah	:	**Systematic Review: Noise Exposure Risks and Factors Associated with Hypertension Incidence in Workers**
Nama semua penulis	:	Intan Sekar Arumdani, Onny Setiani, **Tri Joko**
Status Pengusul (coret yg tidak perlu)	:	~~Penulis Utama/ Penulis Utama & Korespondensi/Penulis Korespondensi/~~ **Penulis Anggota**

Status Jurnal:

• Nama Jurnal	:	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan
• Tahun terbit/Vol/No/halaman	:	2022/Vol. 19/No. 1/ 158-167
• Edisi (bulan,tahun)	:	Maret, 2022
• ISSN	:	e-ISSN : 2550-0023
• DOI	:	https://doi.org/10.14710/presipitasi.v19i1.158-167
• Alamat WEB Jurnal	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/45595
• Terindex di	:	SINTA 2 (SK No. 200/M/KPT/2020)

Kategori Publikasi (beri tanda √ yang sesuai)

• Jurnal Internasional	[ ]	Jurnal internasional bereputasi & memiliki impact factor
	[ ]	Jurnal internasional bereputasi,
	[ ]	Jurnal Internasional
• Jurnal Nasional	[√]	Jurnal Nasional Terakreditasi Dikti Peringkat 1 atau 2
	[ ]	Jurnal Nasional berbahasa Inggris Terindeks CABI atau Copernicus, atau Peringkat 3 atau 4
	[ ]	Jurnal Nasional Peringkat 5 atau 6
	[ ]	Jurnal Nasional

Hasil Penilaian Peer Review:

No	Komponen yang dinilai	Jurnal Nasional Terakreditasi Dikti Peringkat 1 atau 2	Nilai yang didapat artikel
a	Kelengkapan unsur isi artikel (10 %)	2,5	2,5
b	Ruang lingkup & kedalaman pembahasan (30 %)	7,5	7
c	Kecukupan dan kemutahiran data/informasi dan metodologi (30 %)	7,5	7,5
d	Kelengkapan unsur dan kualitas jurnal (30%)	7,5	7,5
	Nilai Total	**25**	24,5
	Nilai yang didapat pengusul: 24,5 X 0,4 = 9,8 /2 = 4,9		

Catatan Penilaian artikel oleh Reviewer

a	Kelengkapan unsur isi artikel	Merupakan *review article* yang telah memenuhi komponen artikel, yaitu *abstract, introduction, methods, result and discussion, conclusions* dan *references.*
b	Ruang lingkup & kedalaman pembahasan	Artikel sesuai dengan ruang lingkup pada Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan. Artikel ditulis dengan baik dan didukung 28 referensi yang relevan. Sebanyak 16 referensi digunakan dalam mendukung penulisan pembahasan.
c	Kecukupan dan kemutahiran data/informasi dan metodologi	Data/informasi pada artikel ini cukup mutahir karena sebagian besar referensi pendukung diterbitkan dalam 10 tahun terakhir. Metode yang digunakan *systematic research* yang telah dituliskan secara jelas.
d	Kelengkapan unsur dan kualitas jurnal	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan merupakan jurnal nasional terakreditasi SINTA 2 (SK No. 200/M/KPT/2020), dengan e-ISSN : 2550-0023.

Semarang, 02 Juni 2022
Reviewer 1

Dr. M. Zen Rahfiludin, SKM., M.Kes.
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Jabatan : Lektor Kepala

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	[ ]	Jurnal Nasional berbahasa Inggris Terindeks CABI atau Copernicus, atau Peringkat 3 atau 4
	[ ]	Jurnal Nasional Peringkat 5 atau 6
	[ ]	Jurnal Nasional

Hasil Penilaian Peer Review:

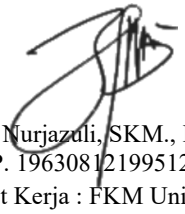
No	Komponen yang dinilai	Jurnal Nasional Terakreditasi Dikti Peringkat 1 atau 2	Nilai yang didapat artikel
a	Kelengkapan unsur isi artikel (10 %)	2,5	2,25
b	Ruang lingkup & kedalaman pembahasan (30 %)	7,5	6,5
c	Kecukupan dan kemutahiran data/informasi dan metodologi (30 %)	7,5	6,5
d	Kelengkapan unsur dan kualitas jurnal (30%)	7,5	6
	Nilai Total	**25**	21,25
	Nilai yang didapat pengusul: 21,25 X 0,4 = 8,5 /2 = 4,25		

Catatan Penilaian artikel oleh Reviewer

a	Kelengkapan unsur isi artikel	Abstract, introduction, methods, Result and Discusion, Conclusion, and References. Memenuhi Kaidah artikel ilmiah.
b	Ruang lingkup & kedalaman pembahasan	Artikel membahas risiko paparan kebisingan dan faktor2 yang terkait dengan kejadian hipertensi. Artikel merupakan kajian sistematik. Artikel ini dipublish di Jurnal Presipitasi, terindek Sinta 2. Isi Artikel relevan dengan scope Jurnal, aspek lingkungan yang merupakan salah satu scope yang bisa dipublish. Pembahsanan sangat mendalam dengan rujukan lebih dari 28 referensi. Hasil pembahasan dalam penelitian ini menekankan bahwa paparan kebisingan meruapakan faktor risiko kejadian hiperensi. Selain itu, karakeristik individu, seperti umur, lama keja, jenis kelain juga berkontribusi terhadap kejadian hipertensi.
c	Kecukupan dan kemutahiran data/informasi dan metodologi	Data hasil penelitian disajikan dalam tabel identifikasi author, metode, populasi, dan hasil atau temuan. Berdasarkan hasil dari artikel sampel dilakukan analisis dan sistensis. Metode penelitian menggunakan disain sistematik review. Sampel artikel yang dinakan sebanyak 9, dan 7 dianytaranya digunakan sebagai sintesis.

d	Kelengkapan unsur dan kualitas jurnal	Artikel diterbitkan di jurnal nasional akreditasi Sinta 2, tidak ada DOI, ada corresponding author, ada penerbit, ada ISSN, tidak ada artikel history, ada volume dan nomer keberkalaan. Daftar rererensi sebanyak 28. Kualitas terbitan cukup.

Semarang, 6 Juni 2022
Reviewer 2



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Unit Kerja : FKM Universitas Diponegoro
Jabatan : Lektor Kepala

SALINAN

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASIA NASIONAL
REPUBLIK INDONESIA

KEPUTUSAN MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL
REPUBLIK INDONESIA

NOMOR 200/M/KPT/2020

TENTANG
PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III
TAHUN 2020

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL
REPUBLIK INDONESIA,

Menimbang : a. bahwa dalam rangka pembinaan terhadap penyelenggaraan ilmu pengetahuan dan teknologi serta untuk meningkatkan relevansi, kuantitas, dan kualitas publikasi ilmiah ilmuwan Indonesia guna mendukung daya saing bangsa diperlukan peringkat akreditasi jurnal ilmiah;

c. bahwa tim Akreditasi Jurnal Ilmiah Kementerian Riset dan Teknologi/Badan Riset dan Inovasi Nasional pada tanggal 18 Desember 2020 telah menetapkan hasil akreditasi jurnal ilmiah periode III tahun 2020;

d. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a dan huruf b, perlu menetapkan Keputusan Menteri Riset dan Teknologi/Kepala Badan Riset dan Inovasi Nasional tentang Peringkat Akreditasi Jurnal Ilmiah Periode III Tahun 2020;

Mengingat ...

Mengingat : 1. Undang-Undang Nomor 12 Tahun 2012 tentang Pendidikan Tinggi (Lembaran Negara Republik Indonesia Tahun 2012 Nomor 158, tambahan Lembaran Negara Republik Indonesia Nomor 5336);

2. Undang-Undang Nomor 11 Tahun 2019 Tentang Sistem Nasional Ilmu Pengetahuan dan Teknologi (Lembaran Negara Republik Indonesia Tahun 2019 Nomor 148, Tambahan Lembaran Negara Republik Indonesia Nomor 6374);

3. Peraturan Pemerintah Nomor 4 Tahun 2014 tentang Penyelenggaraan Pendidikan dan Pengelolaan Perguruan Tinggi (Lembaran Negara Republik Indonesia Tahun 2014, Nomor 16, tambahan Lembaran Negara Republik Indonesia Nomor 5500);

4. Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara (Lembaran Negara Republik Indonesia Tahun 2019 Nomor 203);

5. Peraturan Presiden Nomor 50 Tahun 2020 tentang Kementerian Riset dan Teknologi (Lembaran Negara Republik Indonesia Tahun 2020 Nomor 89);

6. Keputusan Presiden Nomor 113/P Tahun 2019 tentang Pembentukan Kementerian Negara dan Pengangkatan Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024;

MEMUTUSKAN:

Menetapkan : KEPUTUSAN MENTERI RISET DAN TEKNOLOGI/KEPALA BADAN RISET DAN INOVASI NASIONAL TENTANG PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III TAHUN 2020.

KESATU : Menetapkan Peringkat Akreditasi Jurnal Ilmiah Periode III Tahun 2020 sebagaimana tercantum dalam Lampiran yang merupakan bagian yang tidak terpisahkan dari Keputusan Menteri/Kepala Badan ini.

KEDUA ...

KEDUA : Akreditasi Jurnal Ilmiah sebagaimana dimaksud dalam Diktum KESATU berlaku selama 5 (lima) tahun mulai dari nomor dan tahun sebagaimana tercantum dalam Lampiran yang merupakan bagian yang tidak terpisahkan dari keputusan Menteri/Kepala Badan ini.

KETIGA : Setiap jurnal ilmiah wajib mencantumkan masa berlaku akreditasi di dalam laman jurnal dengan menuliskan tanggal penetapan dan tanggal akhir masa berlaku akreditasi.

KEEMPAT : Keputusan Menteri/Kepala Badan ini mulai berlaku pada tanggal ditetapkan.

Ditetapkan di Jakarta
pada tanggal 23 Desember 2020

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL
REPUBLIK INDONESIA,

ttd.

BAMBANG P.S. BRODJONEGORO

Salinan sesuai dengan aslinya
KEMENTERIAN RISET DAN TEKNOLOGI/
BADAN RISET DAN INOVASI NASIONAL
Sekretariat Kementerian/Sekretariat Utama
Kepala Biro Hukum dan Organisasi,

ttd.

Ardhien Nissa Widhawati Siswojo

SALINAN

LAMPIRAN
KEPUTUSAN MENTERI RISET DAN TEKNOLOGI/BADAN RISET DAN INOVASI NASIONAL REPUBLIK INDONESIA
NOMOR 200/M/KPT/2020
TENTANG
PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III TAHUN 2020

PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III TAHUN 2020

Peringkat Baru	No	Nama Jurnal	EISSN	Penerbit	Keterangan
1	1	*ASEAN Journal on Science and Technology for Development*	22249028	Universitas Gadjah Mada	Reakreditasi Tetap di Peringkat 1 mulai Volume 37 Nomor 2 Tahun 2020
	2	*Communications in Science and Technology*	25029266	Komunitas Ilmuwan dan Profesional Muslim Indonesia (KIPMI)	Reakreditasi Tetap di Peringkat 1 mulai Volume 1 Nomor 1 Tahun 2016
	3	*Economic Journal of Emerging Markets* (EJEM)	2502180X	Pusat Pengembangan Ekonomi, Fakultas Ekonomi, Universitas Islam Indonesia	Reakreditasi Naik Peringkat dari Peringkat 2 ke Peringkat 1 mulai Volume 10 Nomor 2 Tahun 2018
	4	IJOG : *Indonesian Journal on Geoscience*	23559306	Badan Geologi	Reakreditasi Tetap di Peringkat 1 mulai Volume 7 Nomor 2 Tahun 2020
	5	IJoLE: *International Journal of Language Education*	25488465	Fakultas Bahasa dan Sastra Universitas Negeri Makassar	Reakreditasi Tetap di Peringkat 1 mulai Volume 4 Nomor 1 Tahun 2020
	6	Ilmu Kelautan: *Indonesian Journal of Marine Sciences*	24067598	Departemen Ilmu Kelautan Universitas Diponegoro dan Himpunan Ahli Pengelolaan Pesisir Indonesia	Reakreditasi Tetap di Peringkat 1 mulai Volume 25 Nomor 3 Tahun 2020
	7	*Indonesian Journal of Forestry Research*	24068195	Badan Penelitian dan Pengembangan Kehutanan, Kementerian Lingkungan Hidup dan Kehutanan	Reakreditasi Tetap di Peringkat 1 mulai Volume 7 Nomor 1 Tahun 2020

Peringkat Baru	No	Nama Jurnal	EISSN	Penerbit	Keterangan
	146	Jurnal Perlindungan Tanaman Indonesia	25484788	Departemen Hama dan Penyakit Tumbuhan, Fakultas Pertanian, Universitas Gadjah Mada bekerja sama dengan Perhimpunan Entomologi Indonesia (PEI) dan Perhimpunan Fitopatologi Indonesia (PFI)	Reakreditasi Tetap di Peringkat 2 mulai Volume 24 Nomor 1 Tahun 2020
	147	Jurnal Politik	24610615	Departemen Ilmu Politik Universitas Indonesia	Akreditasi Peringkat 2 mulai Volume 5 Nomor 2 Tahun 2020
	148	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan	25500023	Departemen Teknik Lingkungan, Universitas Diponegoro	Reakreditasi Naik Peringkat dari Peringkat 3 ke Peringkat 2 mulai Volume 17 Nomor 2 Tahun 2020
	149	Jurnal Profesi Medika : Jurnal Kedokteran dan Kesehatan	26211122	Fakultas Kedokteran Universitas Pembangunan Nasional Veteran Jakarta	Reakreditasi Naik Peringkat dari Peringkat 3 ke Peringkat 2 mulai Volume 14 Nomor 1 Tahun 2020
	150	Jurnal Psikologi	23021098	Fakultas Psikologi Universitas Diponegoro	Reakreditasi Tetap di Peringkat 2 mulai Volume 19 Nomor 2 Tahun 2020
	151	Jurnal Respirasi	26218372	Universitas Airlangga	Akreditasi Peringkat 2 mulai Volume 5 Nomor 1 Tahun 2019
	152	Jurnal Respirologi Indonesia	26203162	Perhimpunan Dokter Paru Indonesia	Reakreditasi Turun Peringkat dari Peringkat 1 ke Peringkat 2 mulai Volume 40 Nomor 3 Tahun 2020
	153	Jurnal Riset Kimia	24768960	Universitas Andalas	Akreditasi Peringkat 2 mulai Volume 10 Nomor 1 Tahun 2019

154 Jurnal ...

Peringkat Baru	No	Nama Jurnal	EISSN	Penerbit	Keterangan
	57	Syaksia : Jurnal Hukum Perdata Islam	27153606	Universitas Islam Negeri Sultan Maulana Hasanuddin Banten	Akreditasi Peringkat 6 mulai Volume 15 Nomor 2 Tahun 2018

Ditetapkan di Jakarta
pada tanggal 23 Desember 2020

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL REPUBLIK INDONESIA,

ttd.

BAMBANG P.S. BRODJONEGORO

Salinan sesuai dengan aslinya
KEMENTERIAN RISET DAN TEKNOLOGI/
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Sekretariat Kementerian/Sekretariat Utama
Kepala Biro Hukum dan Organisasi,

ttd.

Ardhien Nissa Widhawati Siswojo

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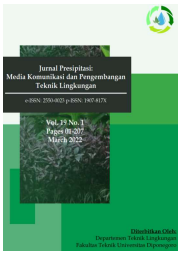

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Muhammad Fadli Ramadhansyah, Onny Setiani, Budiyono Budiyono

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Intan Sekar Arumdani, Onny Setiani, Tri Joko

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Organic Wood Dust Exposure as a Risk Factor for Lung Function Disorders in Workers : Systematic Review (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/45726) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/457

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Alifia Intan Berlian, Onny Setiani, Sulistiyani Sulistiyani

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Study of Desiccation Crack Behavior of Fly Ash - Bentonite (FAB) Composite in Landfill Liner System (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/42978)

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Eflita Yohana, Syafrudin Syafrudin, Mochamad Arief Budihardjo, Bimastyaji Surya Ramadan, Ayudya Izzati Dyah Lantasi, Fadel Iqbal Muhammad, Natasya Ghinna Humaira

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Utilization of Bottom Ash as an Adsorbent for Color and COD Removal for Textile Industry Waste (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/44245)

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Decision Analysis of the Composting Unit at Pluit Emplacement, Jakarta Using the Open Bin, Windrow, and Static Pile Methods for Biodegradable Waste (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/44881)

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Research Article

Utilization of Bottom Ash as an Adsorbent for Color and COD Removal for Textile Industry Waste

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Abstract

This study investigates the use of bottom ash as an adsorbent with and without chemical activation treatment. This study also determines the effect of pH and stirring speed on the efficiency of bottom ash in the adsorption of color and COD. Bottom ash was ground and sieved by 100 mesh sieves and was activated by hydrochloric acid 2%. The experiments were conducted at pH variations of 6, 8, 10; contact time variations of 30, 60, and 90 minutes; and stirring speeds of 30 and 60 rpm. The most effective adsorption by non-activated adsorbents occurred at the combination of pH six and stirring speed of 60 rpm with the removal efficiency for color 66.30% at a contact time of 90 minutes and for COD 31.55% at a contact time of 30 minutes. While for activated adsorbent, the highest removal for color (77.44%) and COD removal (40.54%) were at pH 6, stirring speed 30 rpm, contact time 30 minutes. The bottom ash was potentially used as an adsorbent for treating wastewater containing high concentrations of color and COD.

Keywords: Adsorbent; bottom ash; COD; color

1. Introduction

Fast-growing urbanization and industrialization have resulted in the rapid development of the textile industry in West Java Province, Indonesia; based on data from the Central Bureau of Statistics, the growth of the textile industry has increased by 9.53% by the end of 2019 (BPS, 2020). In specific, the Ministry of Industry has stated that the textile and clothing industry is among the five manufacturing sectors that are prioritized and prepared to support the 4.0 era in Indonesia. The textile and clothing industries have achieved the highest growth, accounting for 15.08% in the third quarter of 2019. These industrial sectors have provided an opportunity to develop national economic growth (Hermawan, 2011). Moreover, the continuous growth of the population has had a positive impact on the textile industry's development.

However, the fast development of the textile industry generates wastewater from the textile production process, causing significant adverse impacts. The wastewater generated from the textile

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Research Article

Synthesis, Characterization, and Application of Rubber Fruit Shell as an Adsorbent for Phosphate Removal in Real Grey Water

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Abstract

The washing waste from the laundry industry contains phosphate that can pollute the environment. Multiple efforts have been made but have not reached the small to medium-scale laundry industry; this happens because of the high cost of technology. In this paper, the sorption process by rubber fruit shells successfully reduced the pollutants parameter from greywater. This research has succeeded in creating an adsorbent with raw rubber fruit shell waste; studies on manufacturing techniques, adsorbent characteristics, ability to reduce phosphate content, and adsorption isotherm models are well described. This study also promotes the utilization of rubber shell waste that has not been utilized properly. Adsorbents derived from rubber fruit shells reduced phosphate levels by up to 98% by adding 0.5 g of adsorbent to 100 mg/L of phosphate for 60 minutes. The appropriate adsorption isotherm model in this study is the Freundlich isotherm model.

Keywords: Adsorption; greywater; freundlich model; rubber fruit shell

1. Introduction

Environmental pollution is an issue of concern to the world (United Nations Environmental Programme, 2013). Various studies have reported pollution in the environment (soil, water, and air) (Appannagari, 2017). Pollution that occurs damages the environment and can hurt human health, environmental sustainability, animal habitats, and threatens the life of plants. Industrial activity is mainly caused use pollution that occurs; activities that can't be separated from human life are one of the leading causes of the decline in the quality and quantity of the environment. On the one hand, the industry positively impacts economic growth and fulfils human needs. Besides, many industrial activities have not prioritized proper and correct waste management. That is due to the high costs incurred when processing waste, especially in small and handled industries such as laundry (Turkay et al., 2017).

Laundry activities produce used washing waste in detergents containing nitrogen, phosphate, heavy metals, linear alkylbenzene sulphonate, volatile organic acids, alcohols, pH, and oxygen demand (Braga & Varesche, 2014). Various studies have reported the dangers caused by laundry waste activities (Ciabattia et al., 2009; Eriksson et al., 2002; Inyinbor et al., 2019; Samadikun et al., 2021; Šostar-Turk et al., 2005; Watiniasih et al., 2019). In a recent study, greywater can change soil characteristics such as saturated hydraulic conductivity, electrical conductivity, pH, exchangeable sodium percentage, cation

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Research Article

Performance of Electrocoagulation Process for Microplastic Fibre Removal from Laundry Wastewater

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Abstract

Laundry wastewater contains not only detergent but also contains fabric fibres and threads. Microplastic fibres have been discovered as a potential source of microplastic fibres in synthetic clothing washed in the environment. To reduce microplastic concentration in wastewater, many approaches have been developed. Electrocoagulation is one of them. Using both synthetic microplastics and laundry wastewater samples, this study examined the performance of electrocoagulation methods to remove microplastics. The flocculation and deposition mechanisms remove microplastic fibre. This research was set up by using a reactor with a volume of 1 L, 60 V of voltage and 60 minutes of contact time. Electrical current of 5A and 10A was applied to remove microplastic fibres during electrocoagulation (EC). The removal efficiency of polyester fibre was 55-68 per cent for 60 minutes with a current of 5A and 42-85 per cent for 60 minutes with a current of 10A. Polyamide fibre removal efficiency in 60 minutes is 53 per cent to 74 per cent at 5A current and 57 per cent to 72 per cent at 10A current. According to this study, it can be concluded that EC can remove microplastic fibre from laundry effluent.

Keywords: Electrocoagulation; microplastics; removal

1. Introduction

Plastics are derived from one polymer produced from various reactions that use petroleum or natural gas as the material (Cole et al., 2011). Plastic is also one of the materials used in almost every activities, material, clothing, food, and board because of its practicality and the nature of the material, which is flexible, sturdy, and lightweight to carry anywhere. However, plastic can threaten the environment, especially water bodies. The fishing industry contributes about 18 per cent of the marine plastic debris found in the ocean environment (Hinojosa and Thiel, 2009).

Nowadays, a particular concern is the occurrence of smaller pieces of plastic debris, referred to as microplastics. Activities carried out in the plastics and cosmetics industry are sources of microplastics in water bodies (Lumban Tobing et al., 2020). Microplastics are manufactured for particular applications, such as industrial scrubbers or personal cleaning products such as toothpaste. Microplastics have a size of > 1 mm but not more than 5 mm (Gouin et al., 2015; Van Cauwenberghe et al., 2013), which makes them not readily visible to the naked eye with the aid of a microscope.

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Research Article

The Determinant of Environmental Disclosure in ASEAN Countries

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Abstract

The purpose of this study is to examine the effect of firm size, industry type, profitability, firm age, environmental performance, institutional ownership, and gender diversity on environmental disclosure. The quantity of environmental disclosure is measured using disclosure scoring by giving "1" for items disclosed and "0" for items that are not disclosed. The population used in this study are manufacturing companies listed on the Indonesia Stock Exchange (IDX) and Kuala Lumpur, Stock. Exchange (KLSE) in the year 2019. The sampling technique used was purposive sampling which resulted in 74 companies. The analytical technique used in this research is multiple linear regression analysis using IBM SPSS Statistics version 25. The results of this study indicate that company size, company age, and environmental performance have a significant positive effect on environmental disclosure. The type of industry, profitability, institutional ownership, and gender diversity does not affect environmental disclosure. Based on the study results, it can be concluded that companies that are large in size and mature in age and equipped with ownership of ISO 14001 certification can contribute to making more comprehensive environmental disclosures.

Keywords: Environmental disclosure; Indonesia; Malaysia

1. Introduction

The environment issue is still the top topic in the WEF Annual Meeting held in Switzerland on 22nd – 25th January 2019 (Parker, 2019). Indonesia and Malaysia are developing countries in Southeast Asia with high pollution levels (IQAir, 2019). On the other hand, both countries have a low level of environmental disclosure compared to other disclosures. Indonesia has an environmental disclosure level of 31.4 out of 100, while Malaysia has 36.3 out of 100 (IQAir, 2019). The survey conducted by the Air Quality Index (2019) shows Indonesia and Malaysia have pollution levels of 51.7 µg/m³ and 19.4 µg/m³. The pollution exceeds the maximum limit set by the World Health Organization is 10 µg/m3. According to Greenpeace (2019), air quality in Indonesia has been at the level of PM 2.5 concentration, the same as in Kuala Lumpur.

Indonesia and Malaysia are developing countries that cannot be separated from the problem of environmental pollution. The majority of environmental pollution is caused by air quality and even corporate operational activities (Bahri and Cahyani, 2017). Companies that often cause environmental

Systematic Review: Noise Exposure Risks and Factors Associated with Hypertension Incidence in Workers

by Tri Joko

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Review Article

Systematic Review: Noise Exposure Risks and Factors Associated with Hypertension Incidence in Workers

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Abstract

Noise is associated with hypertension. Exposure to noise that exceeds quality standards can cause an increase in workers' blood pressure. This study was conducted to examine the risk of noise exposure and the factors associated with the incidence of hypertension in workers through a systematic review method. Article searches were conducted through the journal sites Google Scholar, Garuda Portal, Science Direct, Proquest, JSTOR, Scopus, Semantic Scholar, and PubMed. The selection of articles was carried out with the following criteria: the dependent and independent variables were the incidence of hypertension in workers and exposure to noise, open access full text, the articles selected were articles with a publication date of not more than 10 years (2012-2021), and articles in English. Indonesian and English. Based on 724 relevant articles, 9 main articles met the criteria and were discussed further in this study. 9 main articles showed statistical test results p-value <0.05 which means there is a significant relationship between noise exposure and the incidence of hypertension in workers. Other factors, namely age of workers, length of work, gender, use of ear protective equipment, BMI, and family history of hypertension all have a significant relationship with the incidence of hypertension.

Keywords: Noise exposure; hypertension; blood pressure; worker

1. Introduction

The global economy is influenced by the existence of a workplace which also affects the availability of employment opportunities. In this modern era, the workplace has developed by implementing industry 4.0, which refers to increased automation, machine to machine, and human to machine communication (Jeshika, 2019). More interaction between machines and workers can undoubtedly increase work efficiency, but sophisticated machines can hurt workers' health. One of the impacts or hazards caused is the noise generated by production machines (Dewi et al., 2021).

Noise can be defined as any unwanted sound that can cause hearing loss (Menteri Tenaga Kerja Dan Transmigrasi Republik Indonesia, 2011). The Threshold Value for the noise level contained in the Decree of the Minister of Manpower of the Republic of Indonesia number 5 of 2018 is 85 dBA for 8 hours of exposure in one day or 40 hours in one week (Menteri Ketenagakerjaan Republik Indonesia, 2018). Meanwhile, WHO sets the maximum threshold value for noise in industrial areas at 70 dBA (WHO, 1999).

In addition to causing a significant impact on hearing loss, noise is also associated with cardiovascular disease, one of which is hypertension. Noise exposure can increase blood pressure and

pulse rate. Workers exposed to noise for five years and experiencing a continuous increase in blood pressure can cause hypertension (Mukhlish et al., 2018). Several factors in the work environment can cause an increase in blood pressure in workers. In addition to lighting and heat stress, noise is a work environment factor that can affect increasing blood pressure. Exposure to noise that exceeds quality standards can cause emotional disturbances and affect physiology (heart rate) and increase a person's blood pressure. (Afifah et al., 2016).

Based on a comprehensive global analysis conducted by WHO and Imperial College London, people with hypertension have increased from 650 million to 1.28 billion people in the last 30 years. Based on 2019 data, around 1.13 million people worldwide experience hypertension, most experienced in developing countries with low incomes (Nonasri, 2020). Several studies have proven a relationship between noise exposure and the incidence of hypertension in workers, one of which in industry X, as many as 67.9% of workers exposed to high noise 85dB between (85 - 100.1 dB). Workers who suffer from hypertension are primarily found in locations exposed to high noise. From the results of statistical tests, it was found that there was a significant relationship between noise intensity and the incidence of hypertension (p=0.007)(Andjani and Mediana, 2021).

Hypertension can develop as a result of either high or low blood pressure. Hypertension is sometimes only discovered when difficulties in target organs such as the kidneys, brain, heart, and eyes occur. Hypertension is also linked to a higher risk of stroke. Other cardiovascular diseases that can arise due to complications of hypertension include the risk of myocardial infarction, kidney failure, dementia and atrial fibrillation. Therefore, it is necessary to do early detection to prevent hypertension in workers and reduce the risk of cardiovascular complications to death (Anshari, 2020). This review is essential because it has not been widely reviewed, and the results can be used as a reference for stakeholders to pay more attention to the health and welfare of their workers. Detection of hypertension can be done earlier to extend workers' working periods and productivity. This study was conducted to examine the risk of noise exposure and the factors associated with the incidence of hypertension in workers, based on articles that have been published in national and international journals.

2. Methods

This research was conducted through a systematic review method of various articles. A systematic review is used to help convey information more structured and comprehensively with inclusive results and make accurate conclusions. There is a specific time vulnerability in the article used so that it can be found novelty faster for research results. Based on 724 relevant articles, 9 main articles met the criteria and are discussed further in this article. The articles that have been obtained will then be collected, tabulated, compared, then summarized, and concluded.

Meanwhile, keywords are used for English-language journals: "Noise Exposure with Hypertension in workers" and "Noise with hypertension". Indonesian-language articles are obtained from accredited journal sites (Google Scholar and Garuda Portal). International journals are obtained from databases: Science Direct, Proquest, JSTOR, Scopus, Semantic Scholar, and PubMed.

The selection of articles begins with reading the abstract, which obtained 724 articles. Then, after reviewing the complete article's contents and evaluating many inclusion criteria, the re-election was carried out. Reading journals, books, and other sources about noise and the occurrence of hypertension in workers helped to determine the inclusion criteria.. Inclusion criteria consist of : (1) the dependent variable in the research article was the incidence of hypertension in workers, (2) the independent variable in the research article was noise exposure, (3) open access full text, (4) the articles selected are articles with a publication date of no more than the last ten years (2012-2021), and (5) articles in Indonesian and English. Exclusion criteria, the article is a review article and not a research article. After conducting a full-text review, nine articles met the criteria. The flow chart for sorting articles can be seen in Figure 1. The next step is to analyze to assess the relevance of the literature found. The articles that have been collected will be analyzed through several stages. The first article will

be collected, then tabulated, compared to the findings, summarized, and concluded. The analysis is done by comparing the same study results across many variables. The data/information obtained from the article will be recapitulated and displayed in the form of a synthesis matrix table. The analysis is presented in the form of a narrative.

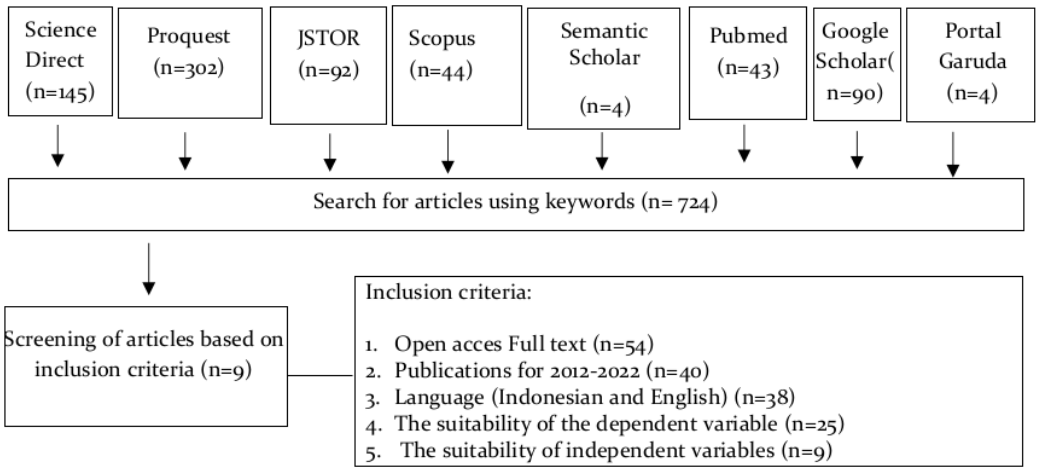

Figure 1. Article selection flowchart

3. Result and Discussion

The research locations of all the articles studied are in the Asian region. Three studies are in China, and the rest are in Indonesia. The majority of the research locations of the articles studied are developing countries. The type of research in the article being studied is analytic observational. There are 6 articles with a cross-sectional design, 1 article with a case-control design, and 1 article cohort. Based on a review of 9 selected articles, the number of samples in the study varied from 37 to 1,874.

All research subjects are more than 20 years old, and all research subjects are workers in industries, factories, airports and ports. Measuring instruments or instruments used in research related to noise exposure with the incidence of hypertension are sound level meters to measure noise intensity, sphygmomanometer to measure blood pressure, microtoise to measure height, and scales to measure weight. All studies also used an instrument in the form of a research questionnaire to determine individual characteristics related to the incidence of hypertension in workers.

All publications reported that noise exposure was significantly connected to the occurrence of hypertension in employees, as evidenced by the results of statistical tests in each study, which revealed that the p-value was less than 0.05, or the OR value, and the lower and higher bounds. The 95 percent confidence interval (CI) value was greater than 1. Noise exposure has been identified as a major risk factor for hypertension. Worker age, length of employment, gender, use of hearing protection, body mass index, and family history were also found to have a significant link with the occurrence of hypertension.

Table 1. Article finding

Research Title & Location	Author & Year Published	Method	Population	Result

Research Title & Location	Author & Year Published	Method	Population	Result
1). Relationship between Noise Exposure and Hypertension in Cable Industry Employees (West Java) (Andjani and Mediana, 2021)	Nabilla, 2021	Observational analytics, Cross-sectional. Interviews with questionnaires and measurements using a sound level meter, sphygmomanometer, microtoise, and weight scales.	The workers at the cable factory in West Java are 78 male respondents aged 22-53 years.	67.9% of workers were exposed to high noise ≥85dB between (85 - 100.1 dB). Workers who suffer from hypertension are primarily found in locations exposed to high noise. From the results of statistical tests, it was found that there was a significant relationship between noise intensity and the incidence of hypertension (p = 0.007). Workers with age ≥40 years (54.3%). Suffering from hypertension stages 1 and 2. From the results of statistical tests, there is a significant relationship between age and hypertension (p = 0.019).
2). The Relationship of Noise Intensity and Length of Work with Incidence of Hypertension in The Manpower of The Production Division of PT. Japfa Comfeed Indonesia Tbk (South Kalimantan) (Setiawan et al., 2018)	Andry, 2017	Analytical surveys. Cross-sectional. Interviews with questionnaires and measurements using a sound level meter, sphygmomanometer, microtoise, and weight scales.	There are 57 respondents in the production division.	Measurement of noise intensity reached 88.2 dB. The results of statistical tests showed a moderate relationship between noise intensity > 85 dB and the incidence of hypertension (p-value = 0.002 < = 0.05 r = 0.407) There is a relationship between length of service or tenure (>3 years) with the incidence of hypertension (p-value = 0.014 < = 0.05 r = 0.323).
3). Effect of Aircraft Noise Exposure on Hypertension Incidence Rates in Adi Sumarmo Boyolali Airport Employees (Central Java) (Prasetya et al., 2016)	Novandi, 2016	Analytical Observation. Cross-sectional.	Adi Sumarmo Boyolali airport employees numbered 91 respondents	There are 9 employees (20.93%) who suffer from hypertension when they are exposed to low noise (85 dB). Of employees who are exposed to high noise (≥85dB), there are 22 employees (51.16%) who suffer from hypertension. The statistical tests showed a p-value of 0.004, so that p < 0.05, there was a significant relationship between noise intensity and the incidence of hypertension.
4).Hypertension in Workers Exposed to Noise at PT. Indonesia Power Ubp Bali 2015 (Bali) (Suginama and Duana, 2019)	Putu, 2015	Crossseectional. Interviews with questionnaires and measurements using a sound level meter and sphygmomanometer.	There are 79 respondents at PT Indonesia Power UBP Bali.	The results of statistical tests showed that there was a significant relationship between noise exposure ≥85 dB(A) (p=0.000), age ≥40 years (p=0.028), respondents who did not comply with the use of ear protective equipment (p=0.000), and years of service. 5 years (p=0.004).

Research Title & Location	Author & Year Published	Method	Population	Result
5). Noise Exposure and Hypertension Among Port Workers (North Kalimantan) (Harianto and Pratomo, 2013)	Eddy, 2013	Crosssectional.	There are 361 respondents at Tarakan Class II Port.	The statistical tests showed a significant relationship between noise exposure and the incidence of hypertension, p value = 0.03 POR = 0.52 (95% CI = 0.29 – 0.95). The statistical tests showed a significant relationship between age > 42 years and the incidence of hypertension, p value = 0.000 with POR = 5.89 (95% CI = 1.89 - 18.33). The statistical tests showed a significant relationship between BMI and the incidence of hypertension. The results of statistical tests on obese BMI obtained p-value = 0.26, POR value = 3.53 (95% CI = 0.71 - 4.46). The statistical tests on obesity BMI obtained a p-value = 0.11 and a POR value of 5.66. The results of statistical tests showed that there was a significant relationship between family history and hypertension (p-value = 0.03).
6). Airport Noise Level Event With Hypertension In The Cargo International Airport Workers Adisucipto Yogyakarta (Jawa Tengah) (Indra and Tedy Candra Lesmana, 2013)	I Made, 2013	Analytical observation. Cross-sectional. Interviews with questionnaires and measurements used a sound level meter, a mercury sphygmomanometer, and a stethoscope.	There are 37 respondents at Adisucipto Airport Yogyakarta.	The average noise level is 90.8 dB and exceeds the threshold value of ≥85 dB. The statistical tests showed a significant relationship between the noise level and the incidence of hypertension, the p-value = 0.000.
7). A cross-sectional study on the effects of occupational noise exposure on hypertension or cardiovascular among workers from an automobile manufacturing company in Chongqing, China (China)	Shuai, 2013	Cohort Study. Interviews with questionnaires and measurements using a sound level meter and a mercury sphygmomanometer.	Worker The car manufacturing industry in Chongqing, China, totalled 728 respondents.	The noise intensity in the car manufacturing industry was measured to reach 75.0 - 88.2 dB (mean = 78.6). Workers are grouped into noise-exposed and not exposed to noise. As many as (21.49%) of workers experienced hypertension in the noise-exposed group with a statistical test value ($p < 0.01$). With a statistical test value of < 0.01), the percentage of female workers with hypertension has a significant link with the incidence of hypertension when compared to male workers. The statistical analyses revealed a link

Research Title & Location	Author & Year Published	Method	Population	Result
(Wang et al., 2013)				between 10-20 years of work experience and the occurrence of hypertension. 0.000 was the P-value.
8). Relationship between occupational noise exposure and hypertension: A cross-sectional study in steel factories (China) (Zhou et al., 2019)	Fan Zhou, 2019	Cross-sectional. Interviews with questionnaires and measurements using a sound level meter and a mercury sphygmomanometer.	Workers at steel factory in Guangzhou, China, a total of 1874 respondents.	77.81% or as many as 1213 workers are exposed to workplace noise. The prevalence of hypertension in workers exposed to work noise is 11.98%. The statistical studies revealed a link between noise exposure and the occurrence of hypertension in the workplace. The significance level was 0.034. The prevalence of hypertension in workers exposed to noise was higher than in the unexposed group (adjusted OR: 1.88, 95% CI: 1.45-2.44). The length of labor has a substantial link with the occurrence of hypertension, according to statistical testing. 0.001 was the P-value.
9). Prevalence of hypertension and noise-induced hearing loss in Chinese coal miners (China) (Liu et al., 2016)	Jing Liu, 2016	Case Contol. Interviews with questionnaires and measurements using a sound level meter and a mercury sphygmomanometer.	There are 738 respondents at Datun Coal Power Company China.	The noise intensity measured in the work area reaches 60 to 110 dB. The prevalence of hypertension was 29.2%, significantly higher in workers exposed to noise (≥85dB) compared to the control group (<85dB), with a statistical test value (P=0.012). The statistical tests showed a significant relationship between older age and the incidence of hypertension, p-value = 0.001. (OR =1.112 95% CI = 1.055–1.171). The statistical tests showed a significant relationship between gender and the incidence of hypertension, p value = 0.001. (OR = 0.367 95% CI = 0.228–0.591).

Table 2. Matric Synthesis of Results

The Results of The Study Related Noise with The Incidence of Hypertension			
1.	Noise Exposure	The findings revealed a link between noise levels and the occurrence of hypertension. Workers who work in noisy environments (over 85 dBA) are more likely to develop hypertension.	Source 1,2,3 4,5,6 ,7,8, 9
2.	Age of Workers	Existing research indicates a link between age and the occurrence of hypertension. Hypertension is more common among workers as they get older.	Source 1,4,5,9
3.	Length of Work	The current research results indicate a relationship between the length of service and the incidence of hypertension. The prevalence of hypertension in workers increases according to the length of service.	Source 2,4,7,8

The Results of The Study Related Noise with The Incidence of Hypertension			
4.	Use of Ear Protective Equipment	The current research results show that non-compliance in-ear protection has a significant relationship with the incidence of hypertension in workers.	Source 4
5.	Body Mass Index (BMI)	The current research results show that body mass index has a significant relationship with the incidence of hypertension in workers. An increase followed the increase in BMI in the prevalence of workers with hypertension.	Source 5
6.	Family History with Hypertension	The current research results show that a family history of hypertension has a significant relationship with the incidence of hypertension in workers.	Source 5
7.	Gender	The current research results indicate that gender has a significant relationship with the incidence of hypertension in workers.	Source 7,9

3.1 Noise Exposure

When working, of course, there is an unavoidable interaction between workers with machines and heavy equipment and with reasonably high noise intensity. Noise exposure can increase blood pressure, and it can be proven by measuring blood pressure after noise exposure. The article mentions an increase in the average pressure after work or after noise exposure based on the article reviewed. A total of 2 articles grouped workers to be exposed to noise and not exposed to noise. The number of workers who experience the incidence of hypertension is more prevalent in the group exposed to noise. Workers in Indonesia risk noise exposure of more than 85 dB by 30-50%. Workplaces with noise exposure of more than 85 dB have a risk of hypertension in workers (Sulistyono et al., 2022). Noise is a risk factor for hypertension that can be changed or reduced by intervention. Intervention actions can come from internal or external. Internal actions include adopting a healthier lifestyle, such as eating healthy and nutritious foods, limiting salt intake, stopping smoking, and abstaining from alcohol consumption.External actions taken by treating the noise source include reducing the intensity of the noise source, choosing a machine with a softer sound, modifying the technology for the noise source, changing the type of engine propulsion, installing equipment that blocks the distribution of sound, and using a vibration attenuator for the sound source plate with sound. Smoother and engine maintenance by repairing, replacing or lubricating loose engine components (Sumantri, 2015).

3.2 Age of Workers

Based on 9 articles that have been reviewed, 4 articles state that there is a relationship between the age of workers and the incidence of hypertension in workers. Age factor is very influential on the incidence of hypertension because, with increasing age, the risk of hypertension will be more likely to occur. As a person ages, a person blood pressure will increase. This can be caused by several factors, such as natural changes in the heart and blood vessels. These changes occur naturally during the ageing process. Workers over the age of 40 dominated the publications reviewed in this study.At that age, hypertension is more common because of natural changes in the body that affect the elasticity of blood vessels and a decrease in body resistance as people get older (Maulidina et al., 2019).

3.3 Length of Work

A more extended working period can make workers more exposed to hazards posed by the work environment, including noise. Thus, long working hours will affect and accumulate on the worker's body (Luthfiyah and Widajati, 2019). The longer the workforce is in a noisy area, the exceeds the Threshold Value in one day, and the longer you will be exposed to noise and hazard hazards that can have a negative impact on health. From 9 articles reviewed, 4 articles stated that the length of work that varied from 3 years to 20 years had a relationship and was associated with the incidence of hypertension in workers. The incidence of hypertension is more common in workers with a more extended working period.

3.4 Use of Ear Protective Equipment

In the study conducted (suwaji, 2013), there was a difference in blood pressure after work in workers who used earplugs and did not use earplugs. From the results of statistical tests obtained, systolic blood pressure values p-value = 0.003 and diastolic blood pressure p-value = 0.007. Based on the research above, earplugs are significantly associated with increased blood pressure. Researchers concluded that the diastolic pressure after working on the earplug was lower at 1.67mmHg than the diastolic pressure after not wearing an earplug. (Susanti and Suwaji, 2013). In this study, there was 1 corresponding article. The statistical tests show that respondents who were not obedient in using ear protection equipment got a value (p-value = 0.000). Earplugs and earmuffs are ear protection devices used to protect a person from noise hazards with great intensity. Earplugs can reduce noise by 8-30 dB and are usually used for protection up to 100 dB. The lack of discipline of workers in using ear protection equipment can be caused by discomfort in the use of Ear Protective Equipment or feeling disturbed in communicating between workers. Therefore, monitoring can be applied in strict use and mandatory regulations using ear protection equipment. (Indriyanti et al., 2019).

3.5 Body Mass Index (BMI)

Body Mass Index (BMI) measurement is a simple method to monitor the nutritional status of adults. The BMI value is calculated using measurements and the formula: weight (kg) divided by the result of the square of height (m) (Luthfiyah and Widajati, 2019). In this study, 1 article stated that workers with overweight BMI had a significant association with the incidence of hypertension. The statistical tests obtained a p = 0.11 and a POR value of 5.66. It can be concluded that workers with an overweight BMI are at 5.66 times greater risk of suffering from hypertension than workers with a normal BMI. The results of the study (Kusumaningtiar 2017) showed that a person's blood pressure is influenced by their nutritional state. If the weight increases above the ideal body weight, then the risk of hypertension also increases. Weight loss trials showed an average change in systolic blood pressure and diastolic blood pressure of about 5.2 mmHg in hypertensive patients and 2.5 mmHg in people with normal blood pressure. It can be established that for every kilogram of weight lost, the predicted blood pressure drops by 1 mmHg. (Kusumaningtiar et al., 2017). Obesity or being overweight has a risk of developing hypertension. Obesity occurs due to the lack of attention of workers to nutritional intake. Too often, eating foods with high salt content also impacts the risk of hypertension(Sulistyono et al., 2022).

3.6 Family History with Hypertension

Based on the article review, there is 1 article with statistical test results showing a significant relationship between family history and hypertension (p-value = 0.03). In a study conducted (angesti, 2018), the results of logistic regression analysis showed that a family history of hypertension was the dominant factor for hypertension with an OR value of 3.884, which means that respondents who have a family history of hypertension have a 3.9 times greater chance of experiencing hypertension than respondents who do not have a history of hypertension. Hypertension. Research in India revealed a close relationship between a family history of hypertension and the incidence. In this case, the family history of hypertension is more emphasized through parenting in the family, decreased diet, and parental income levels. (Angesti et al., 2018). Usually, one family lives in the same environment, having similar habits and environmental risk factors, such as daily lifestyle and food consumed. These same factors can then increase the risk of hypertension in family members (Heryant and Pulungan, 2019).

3.7 Gender

This study discovered a statistically significant association between the occurrence of hypertension in female workers and male workers, with a statistical test value (p 0.01). Another study found that 15 percent of male respondents had hypertension, whereas female respondents had greater

hypertension than men, with 27 percent having hypertension (45 percent). A p-value of 0.035 was found in statistical tests. It can be concluded that there is a significant link between gender and hypertension occurrence.Women will experience an increased risk of hypertension after 45 years because they will experience menopause. Women who have gone through menopause have low levels of estrogen. While this estrogen functions to increase levels of High-Density Lipoprotein (HDL), which plays a significant role in maintaining healthy blood vessels. In menopausal women, decreased a decrease will also follow estrogen levels in HDL levels if it is not balanced with a good and healthy lifestyle(Falah, 2019). A man is more likely to have a lifestyle that can trigger an increase in blood pressure compared to women. However, when women enter menopause, the prevalence of hypertension in women will increase because the production of the hormone estrogen decreases, so blood pressure increases (Kusumaningtiar et al., 2017).

4. Conclusion

Noise is associated with cardiovascular disease, one of which is hypertension. Exposure to noise that exceeds quality standards can cause emotional disturbances and affect physiology (heart rate), increasing workers' blood pressure. The statistical test results produced a p-value of 0.05 between noise exposure and the occurrence of hypertension based on an evaluation of 9 papers. There is a substantial link between noise exposure and the occurrence of hypertension in workers in all of the studies. Age of workers, length of work, gender, use of ear protection equipment, BMI, and family history are all factors that have a substantial impact on the occurrence of hypertension. Further control is needed and regular monitoring and evaluation in the use of ear protection equipment to reduce noise exposure to prevent the occurrence of hypertension in workers. Every worker can also do prevention of hypertension by changing a healthier lifestyle.

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