



MINISTRY OF ECONOMY
DEPARTMENT OF STATISTICS MALAYSIA



NARATIF BAHARU UKM
**UNIVERSITI
WATAN KITA**

**FAKULTI
SAINS &
TEKNOLOGI**

Kajian Literatur Sistematis Faktor-faktor yang Mempengaruhi Pengurusan Risiko Keselamatan dalam Makmal Kejuruteraan

(A Systematic Literature Review of Factors Influencing Safety Risk Management in Engineering Laboratories)

Selasa | 26 September 23 | Sasana Kijang Bank Negara Malaysia

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10TH MALAYSIA STATISTICS CONFERENCE

“Looking Beyond GDP: Towards Social Well-being and Environmental Sustainability”

25TH-26TH SEPTEMBER 2023



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1

Pengenalan



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Metadologi



3

Keputusan



4

Perbincangan



5

Kesimpulan



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AGENSIA
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Nine persons, including five BBMP engineers, sustained up to 40% burn injuries after an accidental fire broke out at the Quality Control Laboratory in the BBMP headquarters on Friday. The injured are currently under treatment at Vic ... [Read More](#)



The lab entrance, where a blast occurred, was damaged in the fire

Sumber: The Times of India (Aug 12, 2023)

9 mengalami kecederaan melecur selepas kebakaran di makmal BBMP

- ujian pengestrakan bitumen – terlalu panas

Read more at:

http://timesofindia.indiatimes.com/articleshow/102663626.cms?from=mdr&utm_source=contentofinterest&utm_medium=text&utm_campaign=cppst

Fire injuries prompt CSB to push again on classroom chemical safety

After multiple high school lab fires, US Chemical Safety Board reminds educators of guidance

by Jeff Johnson, special to C&EN

October 29, 2022 | A version of this story appeared in **Volume 100, Issue 38**



Advertiser

MOST POPULAR II

Accidental mix of bleach
Buffalo Wild Wings emplc

What is an allergy sensiti
does a chemical become

10 years after Sheri Sang
academic labs any safer?

Chemistry in Pictures: Dr

25 years after Karen Wet
of dimethylmercury pois
influence persists

Insiden itu melibatkan demonstrasi bilik darjah menggunakan metanol, menurut Lembaga Penyiasatan Keselamatan dan Bahaya Kimia AS (CSB)

Sumber: C&EN (Chemical & Engineering News – Lab Safety) (October 29, 2022)

Three Malaysian students hurt from broken thermometer in science lab



A Hazmat crew cleaning up a mercury spill in a classroom in a school in Labuan, Sabah. PHOTO: THE STAR/ASIA NEWS NETWORK

Para pelajar berada di makmal sains menjalankan eksperimen menggunakan termometer bersaiz pen apabila ia jatuh (Kota Kinabalu)

Sumber: The Strait Times (SEP 29, 2016)

PENGENALAN

Jadual 1. Analisis statistik kemalangan penggunaan bahan kimia dan peralatan tajam dalam kalangan populasi pelajar

Jenis kemalangan	Tahun		
	2017	2018	2019
Bahan kimia	5	2	5
Peralatan tajam	5	0	5
Jumlah	10	2	10

Sumber: Obtainable at http://pppl.umt.edu.my/wp-content/uploads/sites/28/2020/05/Minit-Mesyuarat-JKKP-Induk-UMT-1_2020.pdf. Copywrite 2020 Parental Committee for Occupational Safety and Health at the University of Malaysia, Terengganu

PENGENALAN

1^o

Kelas sains di makmal dan bengkel **membawa risiko** seperti tekanan, bahagian bergerak, voltan tinggi dan letupan

2^o

Makmal mengandungi bahan kimia **berbahaya**. Universiti - langkah keselamatan - latihan, peraturan dan sumber dalam talian (keselamatan)

3^o

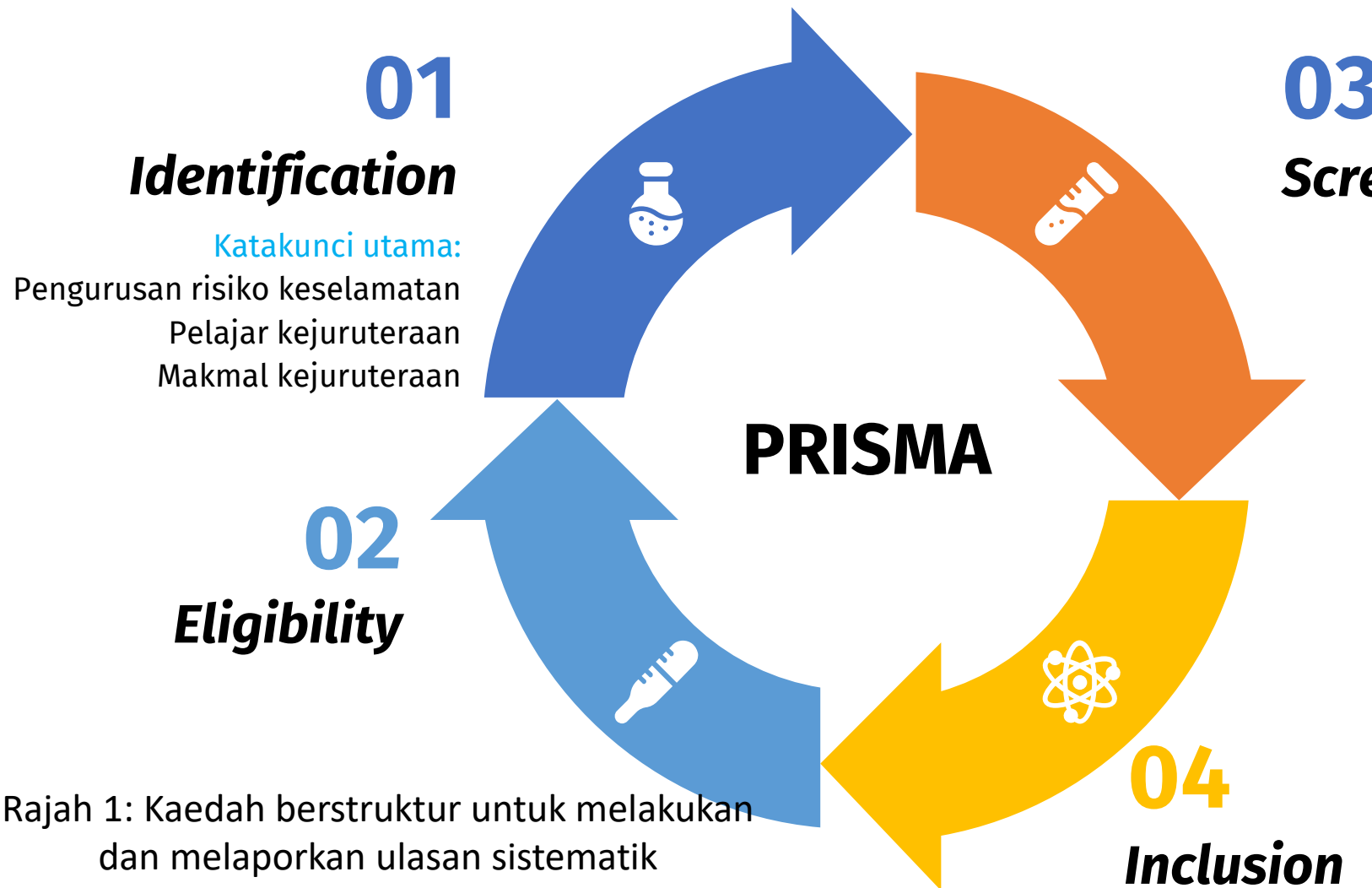
Penyelia makmal - **latihan keselamatan** - makmal selamat dan kondusif. Institusi pendidikan menggunakan makmal dan bengkel - penyelidikan & akademik

4^o

Makmal kolej lebih selamat daripada makmal industri, - makmal **mempunyai risiko**. Menguruskan risiko mengurangkan kemalangan, - penting - **kejayaan semua sektor**

Penyelidikan mendedahkan **jurang dalam pengetahuan** mengenai pengurusan risiko keselamatan di makmal kejuruteraan, terutamanya kekurangan panduan komprehensif untuk **amalan keselamatan yang berkesan**

Apakah **faktor utama** yang **mempengaruhi amalan** **pengurusan risiko keselamatan** di **makmal** **kejuruteraan**?



Jadual 1: Kriteria *Inclusion & exclusion*

Kriteria	Inclusion	Exclusion
Jenis dokumen	Artikel (data empirikal)	Bab dalam buku, buku, artikel ulasan, prosiding persidangan, etc
Bahasa	English	Non - English
Subjek Bidang	Sains Sosial, Kejuruteraan	Perubatan, kesihatan awam, sains alam sekitar, geografi dan kajian bukan sains sosial yang lain

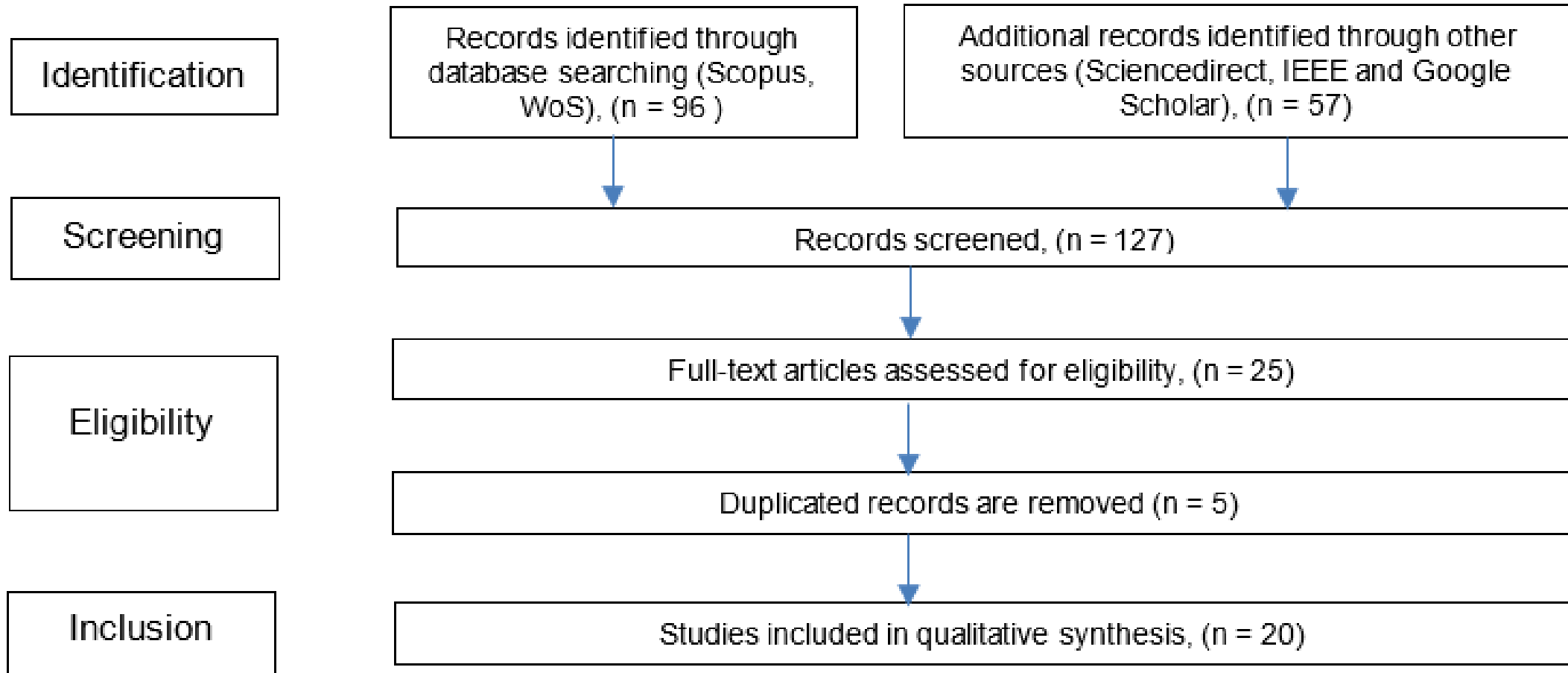
Rajah 1: Kaedah berstruktur untuk melakukan dan melaporkan ulasan sistematik



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FLOW DIAGRAM



Rajah 2: Flow diagram

- QA1. Is the purpose of the study clearly stated?
- QA2. Is the interest and usefulness of the work clearly presented?
- QA3. Is the study methodology clearly established?
- QA4. Are the concepts of the approach clearly defined?
- QA5. Is the work compared and measured with other similar work?
- QA6. Are the limitations of the work clearly mentioned?

The scoring procedure used to evaluate each QA was:

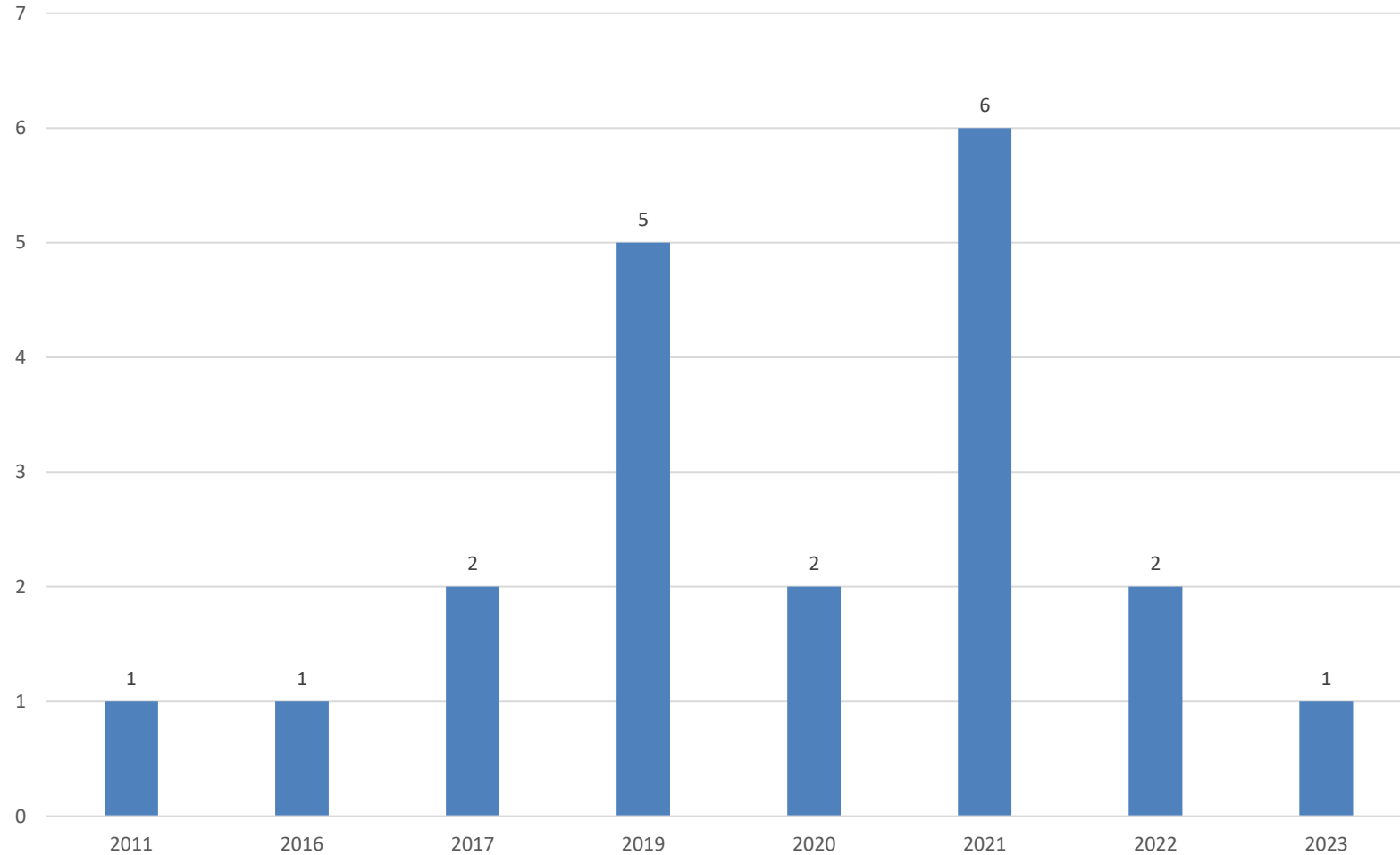
Yes (Y) = 1,

Partly (P) = 0.5

or No (No) = 0

Jadual 2: Keputusan penilaian kualiti

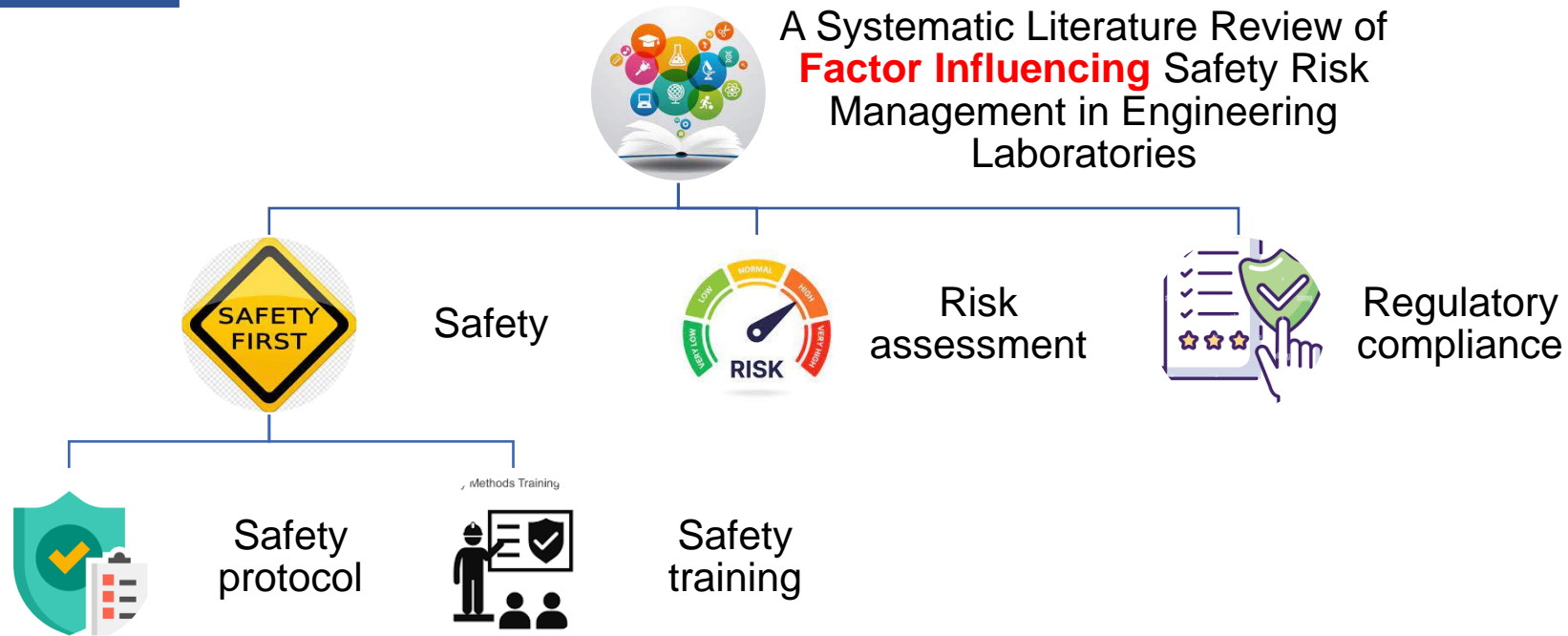
PS	QA1	QA2	QA3	QA4	QA5	QA6	The point of criteria fulfils	Inclusion in the review
Gosavi et al. (2019)	Y	Y	Y	Y	N	N	4	/
Nephew & Sunasee (2021)	Y	Y	Y	Y	N	N	4	/
Álvarez-Chávez et al. (2019)	Y	Y	Y	Y	Y	Y	6	/
Ozdemir et al. (2017)	Y	Y	Y	Y	N	Y	5	/
Marin et al. (2019)	Y	Y	Y	Y	Y	Y	6	/
Thomsen & Borre-Gude (2021)	Y	Y	Y	Y	N	N	4	/
Mocellin et al. (2022)	Y	Y	Y	Y	Y	Y	6	/
Hill (2021)	Y	Y	Y	Y	N	N	4	/
Fatemi et al. (2022)	Y	Y	Y	Y	Y	N	5	/
Mohamed et al. (2021)	Y	Y	Y	Y	N	Y	5	/
Landis Floyd & Valdes (2021)	Y	P	Y	Y	N	N	3.5	/
Araneo et al. (2019)	Y	Y	Y	Y	N	N	4	/
Lindholm et al. (2020)	Y	Y	Y	Y	N	Y	5	/
Wang & Hu (2023)	Y	Y	Y	Y	N	N	4	/
Bahtiti et al. (2021)	P	P	Y	N	Y	N	3	/
Taylor & Snyder (2017)	Y	N	Y	N	P	Y	3.5	/
Willey et al. (2011)	P	Y	Y	Y	N	N	3.5	/
Wirth et al. (2020)	Y	Y	Y	N	N	Y	4	/
Brown et al. (2019)	Y	Y	Y	Y	N	N	4	/
Schröder, Huang, et al. (2016)	Y	Y	Y	N	N	Y	4	/



Rajah 3: Bilangan penerbitan artikel mengikut tahun

Jadual 3: Tema dan subtema

Problem Statement	Safety		Risk Management	Regulatory Compliance
	Safety Protocol	Safety Training		
Gosavi et al. (2019)	/			
Nephew & Sunasee (2021)		/		
Álvarez-Chávez et al. (2019)	/	/		
Ozdemir et al. (2017)			/	
Thomsen & Borre-Gude (2021)	/			
Mocellin et al. (2022)	/		/	
Hill (2021)			/	
Fatemi et al. (2022)		/	/	/
Mohamed et al. (2021)		/		
Landis Floyd & Valdes (2021)			/	/
Araneo et al. (2019)		/		
Lindholm et al. (2020)				/
Taylor & Snyder (2017)	/			
Wirth et al. (2020)	/			
Brown et al. (2019)	/			
Schröder, Huang, et al. (2016)	/	/		/



Rajah 4: Kerangka konseptual penyelidikan

Penciptaan rangka kerja atau model teori perintis yang meningkatkan pemahaman tentang pengurusan risiko keselamatan merupakan **sumber kebaruan yang besar** dalam penyelidikan ini



Pengurusan Risiko yang Berkesan:

- Komitmen kepimpinan
- Polisi dan prosedur keselamatan yang jelas
- Program latihan keselamatan
- Peraturan dan piawaian keselamatan yang berkaitan

A Systematic Literature Review of Factor Influencing Safety Risk Management in Engineering Laboratories

Keputusan dan Implikasi Penyelidikan

- Sumber untuk pengurusan keselamatan praktikal
- Memastikan keselamatan pelajar di makmal kejuruteraan
- Mengambil langkah proaktif untuk keselamatan dan kecemerlangan

TERIMA KASIH

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