

Which Topics Matter in the Use of Personal Protective Equipment among Healthcare Personnel since the Onset of the COVID-19 Pandemic?

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BACKGROUND

- The significance of personal protective equipment (PPE) in protecting healthcare personnel (HCP) has been reaffirmed since the onset of the coronavirus disease 2019 (COVID-19) pandemic.
- This study aimed to examine various topics on PPE use among HCP in healthcare settings for a comprehensive understanding.

METHODS

- From five web-based academic databases, 17,323 studies published between January 2020 and November 2023 were retrieved using PPE-related search terms (Figure 1).
- After removing duplicates, the authors assessed titles and abstracts with the inclusion criteria.
- Using the NetMiner 4.4 software program, semantic morphemes from the 761 selected abstracts were extracted and refined, then text network analysis and topic modeling were applied.
- A text network was structured based on the keywords and analyzed to identify the main keywords.
- Through topic modeling using the latent Dirichlet allocation algorithm, latent topics in the research abstracts were extracted.
- The authors verified the keywords composing each topic, chose the best topic model from among the results options, and named the topics.

RESULTS

- From the text network analysis, the following main keywords were identified based on frequency of use, degree centrality, and betweenness centrality: “Masks”, “HCP”, “COVID-19”, “Usage”, “Hospital”, “Employees”, and “Infection” (Table 1 & Figure 2).
- Based on topic modeling in the research abstracts, eight topics were derived and named. (Figure 3).

CONCLUSION

- By adopting text network analysis and topic modeling methods, our study provides insights into PPE use issues.
- Prominent topics emerged, such as respiratory protection, interventions for compliance, and strategies for addressing challenges in PPE use or shortages.

Abstracts retrieved from Databases:
Ovid (n=4,009)
EMBASE (n=10,770)
Cochrane (n=526)
CINAHL (n=1,874)
PsycINFO (n=144)
Total (n=17,323)

Duplicate removed (n=4,340)

Abstracts screened (n=12,983)

Abstract excluded (n=12,222)

Included studies (n=761)

Figure 1. Flow diagram

Table 1. Main keywords of the text network

	Keywords	Freq	Keywords	DC	Keywords	BC
1	Masks	2453	Masks	0.11	Masks	0.07
2	HCP	1537	HCP	0.05	HCP	0.02
3	COVID-19	1319	COVID-19	0.04	Usage	0.02
4	Study	1304	Usage	0.04	COVID-19	0.02
5	Usage	1248	Study	0.03	Study	0.01
6	Patients	764	Hospital	0.02	Infection	0.01
7	Hospital	587	Patients	0.02	Hospital	0.01
8	Employees	555	Employees	0.02	Employees	0.01
9	Pandemic	532	Infection	0.02	Time	0.01
10	Infection	442	Healthcare	0.02	Gloves	0.01

BC; Betweenness centrality, DC; Degree centrality, Freq; Frequency

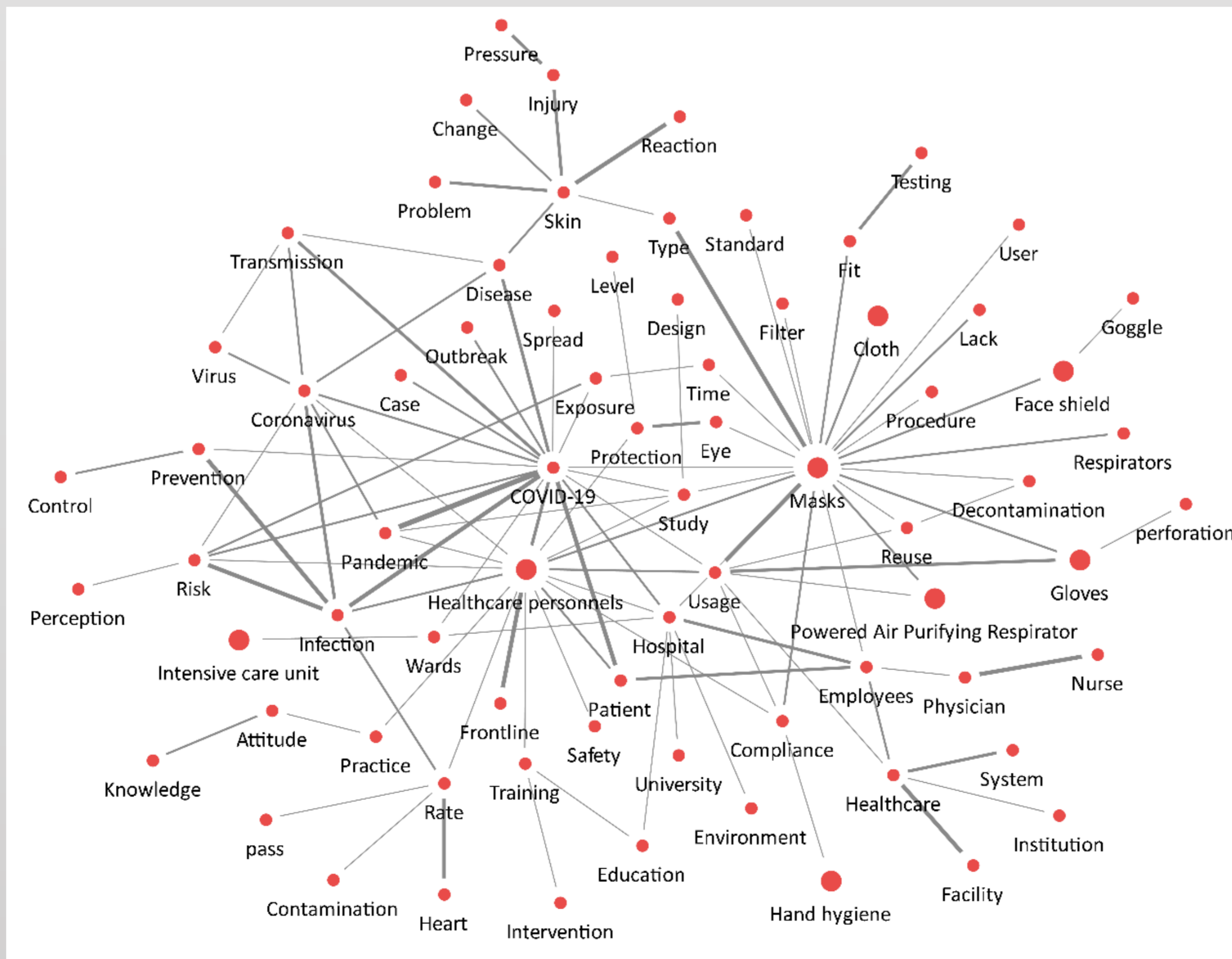


Figure 2. Visualization of the text network

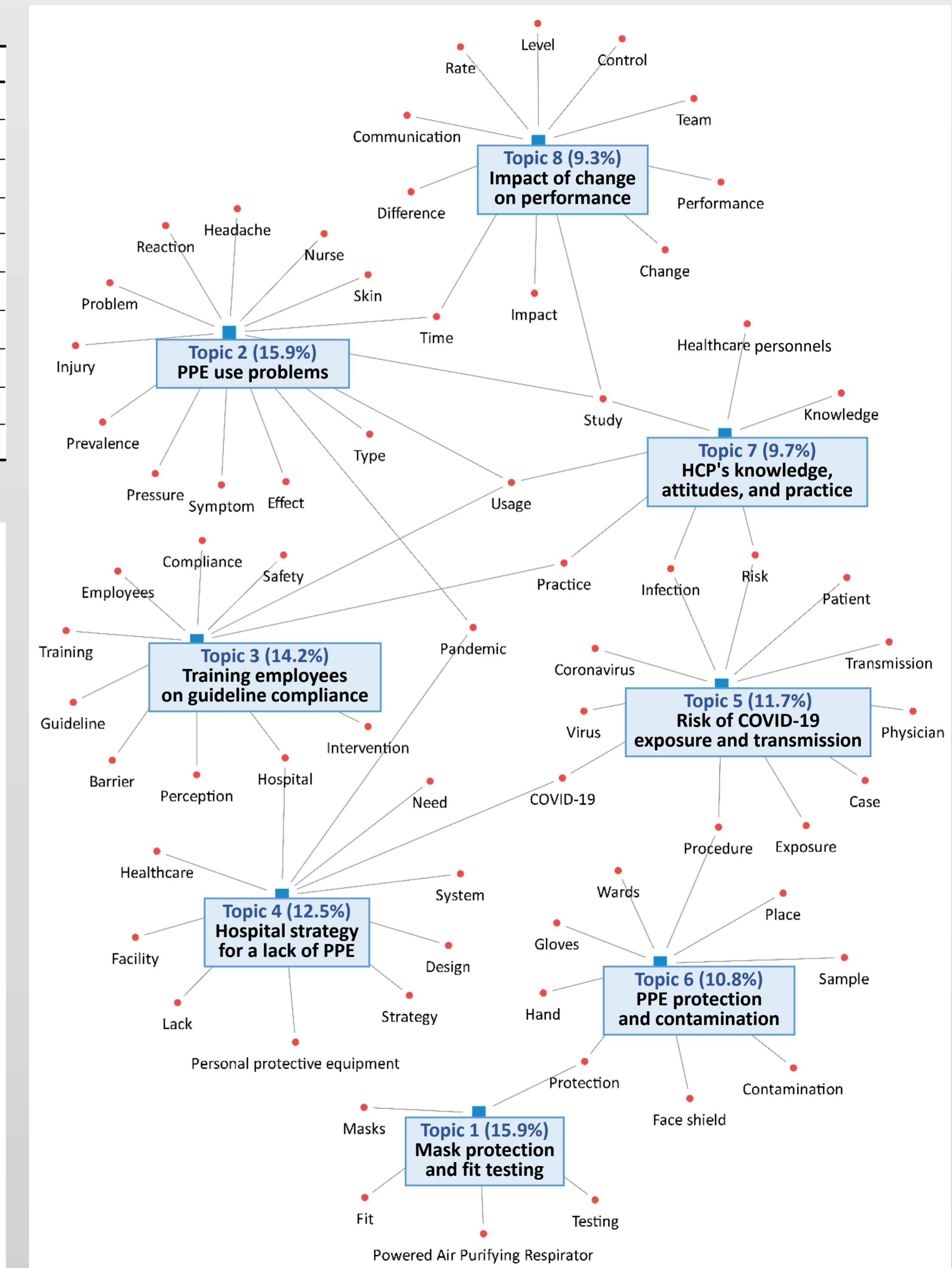


Figure 3. Visualization of topic modeling