

Supplementary table 1 Hypothesis of latent and observed variables

Questionnaire scale	Latent variables	Observed Valuables	Reference
Hearing Protection Knowledge and Attitude	Knowledge	K1. Do you know how many decibels the "noise-exposed work" is greater than or equal to?	(Thepaksorn et al. 2018), (Crandell et al. 2004), (Okpala, 2007)
		K2. Do you know the noise range of the over-exposure to hazardous noise workplaces you frequent?	
		K3. Do you know how many decibels of noise you are exposed to that require earplugs for hearing protection?	
		K4. Do you know how many decibels your earplugs can drop?	
		K5. Can industrial noise cause hearing loss or noise-induced hearing loss?	
		K6. Can noise-induced hearing loss be restored?	
		K7. Can a hearing test assess hearing loss?	
	Attitude	A1. Working in over-exposure to hazardous noise environment can lead to hearing loss, I agree with it.	(Saunders et al. 2014), (Nyarubeli et al. 2020), (Tantranont et al. 2009)
		A2. Working in an over-exposure to hazardous noise environment, it is necessary to use earplugs.	
		A3. Even if wearing earplugs makes an impact on my communication, I still need to wear them.	
		A4. If earplugs are not mandatory, I will insist on wearing them.	
		A5. I think hearing tests are essential.	
		A6. I think hearing protection training is required to use the earplugs well.	
		P1. Painless/Painful	(Byrne et al. 2011), (Doutres et al. 2019), (Tantranont et al. 2009), (Arezes & Miguel, 2002), (Li, 2013)
Comfort	Physical dimension	P2. Ear open/Ear block	
		P3. Ear empty/Ear full	
		P4. Cold/Hot	
		P5. No itching/Itching	
		P6. No feeling isolation/Feeling isolation	
		P7. Easy to communicate/Difficulty in communication	
		P8. Breathable/Not breathable	
		P9. Tight/Loss	
	Functional dimension	F1. Freedom/Limitation	
		F2. Acceptance/Unacceptance	
		F3. Wearing easy/Wearing difficult	
		F4. Simple/Complicated	

F5. Good fit/Poor fit
F6. Convenient/Inconvenient
F7. Soft/Hard
F8. Stability/Instability
