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THE RELATIONSHIP BETWEEN GENDER AND PERCEPTIONS OF HOUSEHOLD CHEMICALS: QUANTITATIVE STUDY AMONG HOUSEWIVES AND FATHERS

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ABSTRACT

The daily life use of household chemicals is inevitable. Household products like household cleaning products, floor cleaners, disinfection water, rinsing water, and fabric bleach are more often used in the household operation. As attitudes toward chemical risks are the products of knowledge, experience, and cultural values of gender roles, they are quite subjective. It is worth mentioning also that this research has scientific urgency in an interdisciplinary context, especially in gender studies, public health and environmental psychology. This research uses a quantitative method as well as an analytical survey by discussing gender and feelings of household chemicals. This technique allows the researcher to gather and analyze data on a more scientific level in order to detect correlations between the variables. Based on the results of the quantitative analysis, it can be concluded that there is a positive and significant relationship between gender and the perception of household chemicals among housewives and fathers.

INTRODUCTIONS

The daily life use of household chemicals is inevitable. Household products like household cleaning products, floor cleaners, disinfection water, rinsing water, and fabric bleach are more often used in the household operation (Znajmiecka-Sikora & Sałagacka, 2022a). The basic function of these chemical materials is the cleanliness and healthiness, as well as the comfortableness of home environment. However, despite their remarkable beneficial properties, their application sometimes takes place without the thorough knowledge or appreciation of the underlying risks there from (Znajmiecka-Sikora & Sałagacka, 2022b). Numerous household products are made of active chemicals that can be harmful if over-used or improperly used, causing skin irritation, respiratory trouble and –in the long term– the risk of cancer or reproductive and hormonal system disturbances (Buchmüller et al., 2020a). Furthermore, chemical pollution also causes environmental pollution, impacting especially water and air quality in the home area (Znajmiecka-Sikora & Sałagacka, 2022b).

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Adding to the Equation, It becomes even more complicated when associated with socio-cultural variable such as gender (Sudaryat et al., 2024). In several households, and especially in Indonesia, gendered division of traditional roles still persists where women (housewives) are predominantly responsible for household activities, such as choosing, buying, and using household products (Kwon et al., 2020). On the other hand, men have traditionally taken on more of a breadwinning role (as fathers) and are generally less involved in these tasks inside the home. Yet, through the last 20 years, we observe profound changes in task sharing between spouses (Bearth & Siegrist, 2019). With the rise of higher education levels, more female workforce participation, and gender equality campaigns, new relational patterns are emerging where men are increasingly involved in household work (M. Lee & You, 2020). This dynamic has consequences on how the actor perceives the use of household chemicals (Buchmüller et al., 2020b).

As attitudes toward chemical risks are the products of knowledge, experience, and cultural values of gender roles, they are quite subjective (Y. H. Kim et al., 2018; Le, 2021). The above issue is mentioned in the literature which points out the women's greater sensitivity to the risk from the use of chemicals (a higher level of vigilance, based on the more often direct contact of women with these products during daily activities) (Znajmiecka-Sikora & Sałagacka, 2022c). Men, on the other hand, tend to be more permissive/lower sensitivity toward these risks, given that they are less involved (Caiola et al., 2018). Yet, not all research will follow this trend. For example, in high-educated urban households, there is a more equitable gender division in household decision-making (Ahmed & Fasilat, 2017; Granda et al., 2024). As a result, an exploratory examination of whether stereotypes related to household chemicals remain male-oriented or are now is agar upon the subsiding wave is important to undertake (Flynn et al., 1994a).

Also, the absence of public enlightenment on the content and side effects of household chemicals justified the need of doing this investigation (Granda et al., 2024). For a variety of consumers, products are only viewed for functionality “Does it clean well, smell good, is it durable" without realising the potential long- term consequences of the chemical composition (Buchmüller et al., 2020b). Low chemical literacy is often reinforced by advertisements which mainly focus on ease and ideal results, paying little attention to the caution and the consideration to use prod ucts (Buchmüller et al., 2020c). By understanding the different perceptions of housewives and fathers, the results of this study can serve as a basis for implementing educational programs that are more in accordance with the social and cultural characteristics of the community (Garcia-Hidalgo et al., 2017).

It is worth mentioning also that this research has scientific urgency in an interdisciplinary context, especially in gender studies, public health and environmental psychology (Klavina et al., 2022; Ricke et al., 2022). The sex differences for both gender information (v) and suspects favoring(not favoring) the male gender (k and k) are discussed next based on various competitive models (Merging vs. competitive models) (complete model (S. J. Lee et al., 2021). Not only does this research seek to address current limitations in the Indonesian academic literature in relation to this topic but to also inform policy makers on more inclusive/household based health promotion strategies that redress inequitable gender relations (Altman et al., 2008; Kemper et al., 2024). The results are anticipated to provide a basis for creating more effective communication and education strategies for policymakers, public health departments (Flynn et al., 1994b), and household product manufacturers that will help make efforts towards the safe and prudent use of chemicals equally accessible for housewives and fathers.

METHOD

This research uses a quantitative method as well as an analytical survey by discussing gender and feelings of household chemicals. This technique allows the researcher to gather and analyze data on a more scientific level in order to detect correlations between the variables. The analytical survey was preferred because of its potential in revealing relationship patterns between respondent groups according to certain category blocks (in this case category blocks of sex) and differences of their perceptions toward the use of domestic chemicals in daily activities.

The population in this study consists of all housewives and fathers residing within the same residential area in Medan City who actively use household chemical products such as floor cleaners, detergents, and disinfectants. The total population was set at 200 individuals. The sample size was determined using the Slovin formula, which is commonly used to calculate the sample size from a known population, with a margin of error of 5% (e = 0.05). The calculation is as follows:

$$n = \frac{200}{1 + 200(0.05)^2} = \frac{200}{1 + 200(0.0025)} = \frac{200}{1 + 0.5} = \frac{200}{1.5} \approx 133.33$$

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Thus, the sample size used in this study was 171 respondents, selected through purposive sampling based on the following criteria:

- Respondents must be housewives or fathers living together within the same household.
- Respondents must have direct experience in using household chemical products.
- Respondents must be willing to participate in the study.

Data collection instrument The main tool for data collection for this study was a closed-ended questionnaire constructed on a 5-point Likert scale format, from "strongly disagree" to "strongly agree". The questionnaire aimed to quantify the respondents' opinions on cleaning chemicals in three categories: perceived usefulness, potential health risk, and knowledge of chemical ingredients. The instrument was an adaptation of instrument called household chemical risk perception scale by Weinstein et al. and has been assessed for reliability across a number of analogous studies.

The testing process consisted in distributing the questionnaire to participants online or in hardcopy depending on the time and on the availability of the participants. The respondents were initially instructed to provide demographic data that included being male or female, age, education and years of experience with household chemicals. They then responded to a set of questions that reflect their opinions about risk and benefit of use of household chemicals.

Next, Pearson's correlation test was also run to explore the association of gender (independent) with participants' perceptions of chemicals (dependent). This test was selected because it quantifies the magnitude and the direction of the linear correlation between two quantitative variables[3]. The data were analyzed using the statistical software SPSS.

RESULT AND DISCUSSIONS

Result

Table 1. Validity Test

Variable	Indicator	R Tabel	R Count	Information
Gender (X)	X.1	0.1710	0.858	Valid
	X.2	0.1710	0.870	Valid
	X.3	0.1710	0.846	Valid
	X.4	0.1710	0.861	Valid
	X.5	0.1710	0.919	Valid
	X.6	0.1710	0.541	Valid
	X.7	0.1710	0.915	Valid
	X.8	0.1710	0.502	Valid
	X.9	0.1710	0.507	Valid
	X.10	0.1710	0.913	Valid
	Y.1	0.1710	0.594	Valid
	Y.2	0.1710	0.553	Valid
	Y.3	0.1710	0.754	Valid
	Y.4	0.1710	0.785	Valid

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Perception (Y)	Y.5	0.1710	0.572	Valid
	Y.6	0.1710	0.766	Valid
	Y.7	0.1710	0.810	Valid
	Y.8	0.1710	0.696	Valid
	Y.9	0.1710	0.596	Valid
	Y.10	0.1710	0.434	Valid

Table 1 presents the validity test results for the variables Gender (X) and Perception (Y) using Pearson correlation against an R table value of 0.1710. The results show that all indicators for both variables have calculated R values (R count) higher than the R table value. For the gender variable, the R count ranges from 0.502 to 0.919, while for the perception variable, it ranges from 0.434 to 0.810. Thus, all of the items are acceptable as they are assumed if they correctly measures what it was designed to measure in the light of the current study. This suggests that the gender-related indicators (attitude, perception, and experience of both housewives and fathers) have a theoretically similar relation with the perception concept toward household chemicals. Likewise, the perception measures are rooted in appropriate and meaningful reactions to information exposure or exposure to household chemical issues. The high validity of the instrument suggests that it can be used for additional analysis and supports the validity of the findings of the study in exploring the relationship between gender and perceptions towards the use of household chemical products.

Table 2. Reability Test

Variabel	***Cronbach Alpha***	**Ket**
Gender	0.928	Reliable
Perception	0.842	Reliable

able 2 presents the reliability test results for the two main variables, namely Gender and Perception. The test results, using Cronbach's Alpha values, show that both variables demonstrate high levels of reliability, with scores of 0.928 for gender and 0.842 for perception. According to general interpretations, values above 0.7 indicate good internal consistency, while values above 0.8 suggest very strong reliability. This indicates that the questionnaire in this current study can generate stable and reliable results, if it is administrated in similar situations. The gender variable that reflects roles, experiences and home tasks, demonstrates a high level of inter-item coherence. At the same time, there is evidence of valid and consistent responses of all household chemicals perception constructs (i.e., perceived risk, perceived label understanding, perceived preventive measures) at the item level. The reliability of the instrument is important because it means the variation in scores from one respondent to the next is due to real differences between respondents and not measurement errors, and thus the relationships among variables will be validly interpretable.

Table 3. Normality Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
NN		133
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	5.98196050
Most Extreme Differences	Absolute	.141
	Positive	.107
	Negative	-.141
Test Statistic		.141
Asymp. Sig. (2-tailed)		.200[c]
A a. Test distribution is Normal.		
b. Calculated from data.		

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c. Lilliefors Significance Correction.

Table 3 presents the results of the normality test using the One-Sample Kolmogorov-Smirnov test on the unstandardized residuals. The test results show an Asymp. Sig. (2-tailed) value of 0.200, which is greater than the significance threshold of 0.05. It means the residual data are normally distributed therefore satisfy the normality assumption. The normality test is important in quantitative research because it is one of the requirements necessary to perform correlation and regression analyses. Since parametric statistical methods (e.g., Pearson Correlation) are more sensitive and accurate in detecting associations between variables, when data are normally distributed, we used them. The absolute differences are also close in the positive and the negative side which denotes that there is nothing conspicuously different than the normal distribution. Thus, the data utilized in the study should be deemed adequate to be analyzed further, and we anticipate that valid interpretations will be derived from the positive association between gender and CHHWOC. The normal distribution of data also ensures that the conclusions drawn in the subsequent statistical analyses are sound.

Table 4. Pearson Correlation Test

		Gender	Perception
Gender	Pearson Correlation	1	.202*
	Sig. (2-tailed)		.020
	N	133	133
Perception	Pearson Correlation	.202*	1
	Sig. (2-tailed)	.020	
	N	133	133

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4 presents the results of the Pearson correlation test between the variables of Gender and Perception toward household chemicals. The co-efficient of correlation of 0.20p=.020 shows that there is a significant positive relationship between the two variables at 0.05 level of significance. This implies, gender identity differences (in this case housewife vs. father) are significantly associated with people attitudes toward household chemicals. Though the coefficient itself is weak (below 0.3), the fact that it is also statistically sound implies that it is not a coincidental finding. The use of, and potential risks associated with, chemicals in the home will be seen differently by men and women. As an example, housewives may be more exposed to chemicals like detergents, floor cleaners, etc resulting in an increased perception of risk or safety relative to fathers. These findings reveal the need to integrate gender into education and household chemical safety policy, providing messages that are context-specific and situated within the experiences and perceptions of the target audience.

Discussion

The result of the Pearson correlation test shows that gender and perception toward household chemical has a significant positive correlation with the correlation coefficient value of 0.202 and the alpha level of (= 0.020). Even though the relationship is weak (less than 0.3), its statistical significance suggests that gender is having an influence on individuals' understandings of household chemicals. This indicates that being a housewife or father plays a role on how they perceive the risk and use of household chemicals.

The disparity in risk perception by gender is a topic of interest in social psychology and environmental health research (Flynn et al., 1994b). Gender role theory suggests that given women's increased care giving responsibilities and participation in domestic duties, they may be more sensitive than men to environmental risks, such as those associated with household chemicals (Rouillon et al., 2018). This hypothesis is also reinforced by the observation that for women these substances are in general found more frequently in the every-day life and they are more aware of their probable risks (Sunyach et al., 2018). For example, Rouillon et al. bring out how endocrine disruptors (found in common household cleaning products), are especially dangerous for women of reproductive age, even when the risk the women are exposed to—cancer—is nongendered.

Support for this line of reasoning comes from Znajmiecka & Salagacka who state that psychological gender in the female (i.e. the female sex-typed) sense enhances safety attitudes and decreases risk-taking behavior while it is opposite for males (i.e. masculine-typed) (Stegehuis et al., 2023). It is indicated that apart from biological sex,

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personality gender traits significantly define the perception and attitude towards household chemical exposure (Znajmiecka-Sikora & Sałagacka, 2022d).

The physical and behavioural consequences of chemical exposures are also gendered, as evidenced empirically. According to Lee (cited in Sunyach), female cleaners experience acute symptoms more than male workers from exposure to chemicals (46% vs. 25.4%) (Stegehuis et al., 2023). But paradoxically, they are more unlikely to report such health complaints to their supervisors (18.5% vs 40.6%) (M. Lee & You, 2020). The silence with which women address workplace hazards reflects structural issues and cultural factors that lead women to be less likely to seek assistance or voice concerns, and they are also more exposed (Albouy-Llaty et al., 2019).

Women respond to household products and use as reflected in consumption choice. Research indicates that women are more likely to value product attributes like fragrance and safety, as well as to consider a product's environmental impact. Caiola and Teysseire underline that these choices are not only aesthetic preferences, but reflect a wider attitude towards health and protection of the environment (Teysseire et al., 2019). Understood in terms of a layered risk framework, women's multi-dimensional concerns— personal safety, family health, and ecological sustainability—are folded into their day-to-day decision-making around cleaning products (Caiola et al., 2018).

These gendered experiences highlight the importance of gender-responsive, and targeted public health interventions. Kim and Jeong posit that maternal health promotion should include information about environmental exposures, as pregnancy increases sensitivity to chemical threats (H. K. Kim & Jeong, 2022). Ortega-García et al. " (2023) also stressed the importance of informed decision to protect women's and children's health.

In general, findings from a number of studies suggest that gender divergences are important in how household chemicals are perceived and responded to. In general, women are more aware of the health and environmental risk associated with these products and are also faced with obstacles when they attempt to report health-related complaints caused by chemical exposure. This suggests that it is very important for policy makers and field health workers to consider gender differences for both intervention and educational programs to enhance the safety of household use of chemicals.

These results have important implications for educational interventions and policies related to household chemical safety. There is a need to use a gender perspective in the development of educational messages for them to be more fit for the experiences and perceptions of each gender. For instance, if a campaign is aimed at housewives, information could stress knowledge of health hazards and safe product use, whereas a campaign addressing fathers would seek to increase knowledge on the significance of involvement in home safety.

In sum, gender plays a major role with regard to perceptions of household chemicals. Risk perception is higher among women, especially housewives than men. This is because of social roles and greater direct experience with them. Therefore, gender should be taken into account as a determinant when developing efficient interventions and education programs to improve safe use of household chemicals by policy-makers and practitioner of public health.

CONCLUSION

Based on the results of the quantitative analysis, it can be concluded that there is a positive and significant relationship between gender and the perception of household chemicals among housewives and fathers. The Pearson correlation test showed a coefficient of 0.202 with a significance of 0.020, indicating that gender differences contribute to how individuals perceive the risks and usage of chemicals in the domestic environment. This difference is reflected in sensitivity to the hazards of chemicals, attention to environmental aspects, and awareness of the long-term impacts of chemical exposure.

Previous and recent studies also substantiate that women including housewives are susceptible to the health effects of chemicals because they are exposed more intensively and frequently. On the contrary, male (fathers) perceived lower risk probably because of lower participation in cleaning limitations at household. Thus, education programs and public policies of safety of household chemicals should take these gender-based perceptual differences into account, so that intervention strategies are more focused and efficient and, above all, better capture the needs and experiences of each group.

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REFERENCES

Ahmed, O. O., & Fasilat, D. O. (2017). Gender Perception on the Health and Environmental Hazards of Pesticide Usage among Cocoa Farmers in Ekiti State, Nigeria. *Journal of Health and Environmental Research 2017, Volume 3, Page 1*, *3*(1), 1–7. https://doi.org/10.11648/J.JHER.20170301.11

Albouy-Llaty, M., Rouillon, S., Ouazzani, H. El, Disprose, G., Rabouan, S., & Migeot, V. (2019). Environmental health knowledge, attitudes, and practices of french prenatal professionals working with a socially underprivileged population: A qualitative study. *International Journal of Environmental Research and Public Health*, *16*(14). https://doi.org/10.3390/IJERPH16142544

Altman, R. G., Morello-Frosch, R., Brody, J. G., Rudel, R., Brown, P., & Averick, M. (2008). Pollution Comes Home and Gets Personal: Women's Experience of Household Chemical Exposure. *Journal of Health and Social Behavior*, *49*(4), 417. https://doi.org/10.1177/002214650804900404

Bearth, A., & Siegrist, M. (2019). Situative and product-specific factors influencing consumers' risk perception of household cleaning products. *Safety Science*, *113*, 126–133. https://doi.org/10.1016/J.SSCI.2018.11.023

Buchmüller, K., Bearth, A., & Siegrist, M. (2020a). Consumers' perceptions of chemical household products and the associated risks. *Food and Chemical Toxicology*, *143*, 111511. https://doi.org/10.1016/J.FCT.2020.111511

Buchmüller, K., Bearth, A., & Siegrist, M. (2020b). Consumers' perceptions of chemical household products and the associated risks. *Food and Chemical Toxicology*, *143*, 111511. https://doi.org/10.1016/J.FCT.2020.111511

Buchmüller, K., Bearth, A., & Siegrist, M. (2020c). Consumers' perceptions of chemical household products and the associated risks. *Food and Chemical Toxicology*, *143*, 111511. https://doi.org/10.1016/J.FCT.2020.111511

Caiola, S., Palleschi, L., Draisci, R., & Mancinelli, R. (2018). Cosmetics, chemical exposure and gender differences. *Italian Journal of Gender-Specific Medicine*, *4*(1), 21–26. https://doi.org/10.1723/2968.29766

Flynn, J., Slovic, P., & Mertz, C. K. (1994a). Gender, race, and perception of environmental health risks. *Risk Analysis : An Official Publication of the Society for Risk Analysis*, *14*(6), 1101–1108. https://doi.org/10.1111/J.1539-6924.1994.TB00082.X

Flynn, J., Slovic, P., & Mertz, C. K. (1994b). Gender, race, and perception of environmental health risks. *Risk Analysis : An Official Publication of the Society for Risk Analysis*, *14*(6), 1101–1108. https://doi.org/10.1111/J.1539-6924.1994.TB00082.X

Garcia-Hidalgo, E., von Goetz, N., Siegrist, M., & Hungerbühler, K. (2017). Use-patterns of personal care and household cleaning products in Switzerland. *Food and Chemical Toxicology*, *99*, 24–39. https://doi.org/10.1016/j.fct.2016.10.030

Granda, L., Moya-Fernández, P. J., Soriano-Miras, R. M., & González-Gómez, F. (2024). Pro-environmental behaviour in household water use. A gender perspective. *Sustainable Water Resources Management*, *10*(2), 1–11. https://doi.org/10.1007/S40899-023-01027-6/TABLES/5

Kemper, J. A., Sharp, E., Yi, S., Leitao, E. M., Padhye, L. P., Kah, M., Chen, J. L. Y., & Gobindlal, K. (2024). Public perceptions of per- and polyfluoroalkyl substances (PFAS): Psycho-demographic characteristics differentiating PFAS knowledge and concern. *Journal of Cleaner Production*, *442*, 140866. https://doi.org/10.1016/J.JCLEPRO.2024.140866

Kim, H. K., & Jeong, G. H. (2022). Effect of Pro-Environmental Prenatal Education Program on Pregnant Women's Environmental Health Awareness and Behaviors based on the Protection Motivation Theory. *Inquiry (United States)*, *59*. https://doi.org/10.1177/00469580211047045

Kim, Y. H., Park, I. K., & Kang, S. J. (2018). Age and gender differences in health risk perception. *Central European Journal of Public Health*, *26*(1), 54–59. https://doi.org/10.21101/CEJPH.A4920

Klavina, A., Kalpisa, M., Paegle, L., Akulova, L., & Vanadzins, I. (2022). Perceptions, Choices and Usage of Ecological Household Chemicals: Results from an Online Citizen Survey in Latvia. *Environmental and Climate Technologies*, *26*(1), 1055–1066. https://doi.org/10.2478/RTUECT-2022-0079

Kwon, S. A., Yoo, H. J., & Song, E. (2020). Korean consumers' recognition of risks depending on the provision of safety information for chemical products. *International Journal of Environmental Research and Public Health*, *17*(4). https://doi.org/10.3390/IJERPH17041207

Le, T. H. (2021). Cross-cultural gender differences in cruising risk perceptions: A study of young adults. *Journal of Hospitality and Tourism Management*, *49*, 296–303. https://doi.org/10.1016/J.JHTM.2021.09.023

Lee, M., & You, M. (2020). Safety behaviors to reduce risk of using chemical household products: An application of the risk perception attitude framework. *International Journal of Environmental Research and Public Health*, *17*(5). https://doi.org/10.3390/IJERPH17051528

Lee, S. J., Kyung, M., Leung, C., & Hong, O. S. (2021). Gender differences in experience and reporting of acute symptoms among cleaning staff. *American Journal of Industrial Medicine*, *64*(6), 528–539. https://doi.org/10.1002/AJIM.23246

Ricke, I. J., Oglesby, A., Lyden, G. R., Barrett, E. S., Moe, S., & Nguyen, R. H. N. (2022). Knowledge, Attitudes, and Behaviors Regarding Chemical Exposure among a Population Sample of Reproductive-Aged Women. *International Journal of Environmental Research and Public Health 2022, Vol. 19, Page 3015*, *19*(5), 3015. https://doi.org/10.3390/IJERPH19053015

Rouillon, S., El Ouazzani, H., Rabouan, S., Migeot, V., & Albouy-Llaty, M. (2018). Determinants of risk perception related to exposure to endocrine disruptors during pregnancy: A qualitative and quantitative study on french women. *International Journal of Environmental Research and Public Health*, *15*(10). https://doi.org/10.3390/IJERPH15102231

Stegehuis, N., Kotsirilos, V., & Parker, J. (2023). *A Systematic Review of Microparticulate Air Pollution in Polycystic Ovary Syndrome*. https://doi.org/10.20944/PREPRINTS202309.1406.V1

Sudaryat, S., Yuanitasari, D., & Judiasih, S. D. (2024). Policy and implementation of gender equality in Indonesian mining companies as an approach to achieve the goals of Indonesian SDGS. *Cogent Social Sciences*, *10*(1), 2400602. https://doi.org/10.1080/23311886.2024.2400602

Sunyach, C., Antonelli, B., Tardieu, S., Marcot, M., Perrin, J., & Bretelle, F. (2018). Environmental health in perinatal and early childhood: Awareness, representation, knowledge and practice of southern France perinatal health professionals. *International Journal of Environmental Research and Public Health*, *15*(10). https://doi.org/10.3390/IJERPH15102259

Teysseire, R., Lecourt, M., Canet, J., Manangama, G., Sentilhes, L., & Delva, F. (2019). Perception of environmental risks and behavioral changes during pregnancy: A cross-sectional study of French postpartum women. *International Journal of Environmental Research and Public Health*, *16*(4). https://doi.org/10.3390/IJERPH16040565

Znajmiecka-Sikora, M., & Sałagacka, M. (2022a). Analysis of the relationship between psychological gender and risk perception style and attitudes towards safety in a group of women and men. *International Journal of Occupational Safety and Ergonomics : JOSE*, *28*(1), 364–375. https://doi.org/10.1080/10803548.2020.1760527

Znajmiecka-Sikora, M., & Sałagacka, M. (2022b). Analysis of the relationship between psychological gender and risk perception style and attitudes towards safety in a group of women and men. *International Journal of Occupational Safety and Ergonomics : JOSE*, *28*(1), 364–375. https://doi.org/10.1080/10803548.2020.1760527

Znajmiecka-Sikora, M., & Sałagacka, M. (2022c). Analysis of the relationship between psychological gender and risk perception style and attitudes towards safety in a group of women and men. *International Journal of Occupational Safety and Ergonomics*, *28*(1), 364–375. https://doi.org/10.1080/10803548.2020.1760527

Znajmiecka-Sikora, M., & Sałagacka, M. (2022d). Analysis of the relationship between psychological gender and risk perception style and attitudes towards safety in a group of women and men. *International Journal of Occupational Safety and Ergonomics : JOSE*, *28*(1), 364–375. https://doi.org/10.1080/10803548.2020.1760527