

UNIVERSITI TEKNOLOGI MARA

**OCCUPATIONAL CONTACT
DERMATITIS EFFECT BY NICKEL
CONCENTRATION IN CHEMICAL
CLEANING AGENTS AMONG
CLEANERS AT A PUBLIC
UNIVERSITY IN SELANGOR**

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TABLE OF CONTENTS

TITLE PAGE	
DECLARATION BY STUDENT	ii
INTELLECTUAL PROPERTIES	iii
APPROVAL BY SUPERVISOR	v
ACKNOWLEDGEMENT	vi
TABLE OF CONTENTS	vii
LIST OF TABLES	x
LIST OF FIGURES	xi
LISTS OF PLATES	xii
LIST OF ABBREVIATIONS	xiii
ABSTRACT	xv
ABSTRAK	xvi
CHAPTER 1: INTRODUCTION	1
1.1 Study background	1
1.2 Problem statement	2
1.3 Research objectives	3
1.3.1 General objective	3
1.3.2 Specific objective	3
1.4 Research questions	4
1.5 Hypothesis	4
1.6 Scope and limitation	4
1.7 Significant of the study	4
1.8 Conceptual framework	5
CHAPTER 2: LITERATURE REVIEW	7
2.1 Occupational contact dermatitis	7

ABSTRACT

Cleaners were categorized as the vulnerable group toward occupational contact dermatitis (OCD) due to exposure to chemical cleaning products. This study investigates the relationship between occupational contact dermatitis effect and exposure to nickel and alkalinity in chemical cleaning agents among cleaners at a public university in Selangor. A guided questionnaire was conducted involving 78 respondents and cleaning products used by the respondents were collected for chemical analysis. There are two instruments used which are PinAAcle 900T Atomic Absorption Spectrometer (AAS) and Winlab Data Line pH-meter which were used to measure Nickel contents and alkalinity level of the cleaning products. The result analysis shows that skin symptoms for redness and itching are significantly associated with the prevalence of occupational contact dermatitis at $\chi^2 = 42.31$, $P = <0.001$ (OR= 219.00) respectively and the alkalinity properties of the cleaning products show an almost significant association with the prevalence of OCD at $\chi^2 = 4.438$, $P = 0.052$ (OR= 0.895). The skin symptoms faced by the cleaners were used to define the prevalence of OCD. Meanwhile, there is no association of nickel concentration in the cleaning products with the prevalence of OCD among these cleaners at $\chi^2 = 1.656$, $P = 0.572$ (OR= 1.077). The findings of this study show skin irritancy towards alkaline agents. This is crucial for cleaning product manufacture since cleaning solutions with a pH between 5.5 and 7.0 may impact the epidermis less. Thus, it is concluded that nickel allergy was difficult to be linked with occupational factors hence, more research is required to figure out the underlying reason for the occurrence of OCD among workers in the cleaning industry.

Keywords: Occupational contact dermatitis, chemical cleaning products, nickel, alkalinity, cleaners

CHAPTER 1

INTRODUCTION

1.1 Study background

Occupational contact dermatitis (OCD) was the type of dermatitis that develops as a result of exposure at work (Kezic, Visser & Verberk, 2009). Contact dermatitis was an inflammatory reaction triggered by direct contact with particular substances which could be acute or chronic contact dermatitis (Saint, et al., 2004). Irritant contact dermatitis (ICD) and allergic contact dermatitis (ACD) are the two types of contact dermatitis (Wibowo et al., 2020). In order to differentiate between irritants and allergens, accurate diagnosis requires comprehensive history collection, complete physical examination, and thorough reading of material safety data sheets (Sasseville, 2008).

Professional cleaning was a fundamental service activity that was performed all over the world in a variety of indoor and outdoor settings (Kuhl, 2017). Maintaining a building's functionality, attractiveness, and suitable hygienic conditions were the primary purposes of cleaning (Zock, 2005). Cleaning services can be found in a variety of industries and workplaces, including both private businesses and public spaces. Cleaning services were characterized as wet work if more than half of the work was done with wet hands, which could be created by contact with water or irritants such as acids, bases, or other solvents (Anderson & Meade, 2014). Working in the cleaning sector made the cleaners become a high-risk group for getting occupational contact dermatitis. This was due to the harmful cleaning and disinfecting products including the requirement to wear occlusive gloves for lengthy periods during the working day (Bauer, 2013).