

KNOWLEDGE AND AWARENESS OF BELL'S PALSY
AMONG UNDERGRADUATE NURSING STUDENTS
IN UNIVERSITI SAINS MALAYSIA

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by

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Dissertation submitted in partial fulfilment of
the requirements for the degree of
Bachelor in Nursing with Honours

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CERTIFICATE

This is to certify that the dissertation entitled ‘Knowledge and Awareness of Bell’s Palsy Among Undergraduate Nursing Students in Universiti Sains Malaysia’ is the bona fide record of research work done by Ms Nurul Nabila Binti Jamaludin during the period from October 2023 to August 2024 under my supervision. I have read this dissertation and in my opinion it conforms to acceptable standards of scholarly presentation and is fully adequate, in scope and quality, as a dissertation to be submitted in partial fulfilment for the degree of Bachelor of Nursing (Honours).

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Date: 7th August 2024

DECLARATION

I hereby declare that this dissertation is the result of my investigation, except where otherwise stated and duly acknowledged. I also declare that it has not been previously or concurrently submitted as a whole for any other degrees at Universiti Sains Malaysia or other institutions. I grant Universiti Sains Malaysia the right to use the dissertation for teaching, research, and promotional purposes.



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TABLE OF CONTENT

CERTIFICATE	ii
DECLARATION	iii
ACKNOWLEDGMENT	iv
LIST OF TABLES	x
LIST OF FIGURES	xi
LIST OF ABBREVIATIONS	xii
ABSTRAK	xiii
ABSTRACT	xiv
CHAPTER 1 INTRODUCTION	1
1.1 Introduction.....	1
1.2 Background of the Study	1
1.3 Problem statement.....	3
1.4 Research Question	4
1.5 Research Objectives.....	4
1.5.1 General Objectives.....	4
1.5.2 Specific Objectives	5
1.6 Research Hypothesis.....	5
1.7 Conceptual and Operational Definitions.....	5
1.8 Significance of the Study	6

CHAPTER 2	LITERATURE REVIEW	8
2.1	Introduction.....	8
2.2	Bell’s palsy	8
2.3	Knowledge of Bell’s palsy.....	11
2.4	Awareness of Bell’s palsy.....	13
2.5	Association between knowledge and awareness of Bell’s palsy	14
2.6	Theoretical and Conceptual Framework of the Study	15
CHAPTER 3	RESEARCH METHODOLOGY.....	18
3.1	Introduction.....	18
3.2	Research Design	18
3.3	Research Location.....	18
3.4	Research Duration.....	19
3.5	Research Population	19
3.6	Subject Criteria	19
	3.6.1 Inclusion Criteria.....	19
	3.6.2 Exclusion Criteria.....	19
3.7	Sampling Plan	19
	3.7.1 Sample Size Estimation.....	19
	3.7.2 Sampling method	21

3.8	Research Instrument	22
3.8.1	Instrument	22
3.8.2	Translation of Questionnaire.....	23
3.8.3	Validity and Reliability	23
3.9	Variables	24
3.9.1	Variable Measurement	24
3.9.2	Variable Scoring.....	24
3.10	Data Collection Process	25
3.10.1	Flow Chart of Data Collection	26
3.11	Data Analysis	27
3.12	Ethical Consideration.....	28
3.12.1	Permission to Conduct the Study	28
3.12.2	Permission to Use the Instrument from the Original Author	28
3.12.3	Subject Vulnerability	28
3.12.4	Declaration of absence of conflict of interest	28
3.12.5	Privacy and Confidentiality.....	28
3.12.6	Community Sensitivities and Benefits	29
3.12.7	Honorarium and Incentives	29
	CHAPTER 4 RESULTS.....	30
4.1	Introduction.....	30

4.2	Socio-demographic Characteristics of the Participants	30
4.3	The Overall Frequency and Percentage Level of Knowledge of Bell’s Palsy....	32
4.4	The Overall Frequency and Percentage Level of Awareness of Bell’s Palsy	32
4.5	Association between Knowledge and Awareness of Bell’s Palsy	33
CHAPTER 5 DISCUSSION		34
5.1	Introduction.....	34
5.2	Level of knowledge of Bell’s Palsy among undergraduate nursing students at USM.....	34
5.3	Level of awareness of Bell’s Palsy among undergraduate nursing students at USM	36
5.4	Association between Knowledge and Awareness of Bell’s Palsy	37
5.5	Strength and Limitation	37
CHAPTER 6 CONCLUSION.....		40
6.1	Introduction.....	40
6.2	Summary of the Study Finding	40
6.3	Implications and Recommendations	40
6.3.1	Nursing Education.....	40
6.3.2	Recommendations	41
6.4	Conclusion	42
REFERENCES.....		44

APPENDICES	50
Appendix A: Instrument	50
Appendix B: Permission from the Author	56
Appendix C: Research Information and Consent Form.....	58
Appendix D: Gantt Chart/Project Schedule.....	70
Appendix E: Institutional Approval.....	71
Appendix F: Ethical Approval.....	73

LIST OF TABLES

Table 1.1: Conceptual and Operational Definitions	5
Table 3.1: Data Analysis for Each Objective.....	27
Table 4.1: Socio-demographic Characteristics of the Participants among undergraduate nursing students at USM (n=127)	31
Table 4.2: The Overall Frequency and Percentage Level of Knowledge towards Bell's Palsy among Undergraduate Nursing Students in USM.....	32
Table 4.3: The Overall Frequency and Percentage Level of Awareness towards Bell's Palsy among Undergraduate Nursing Students at USM.....	33
Table 4.4: Association between Knowledge and Awareness of Bell's Palsy (n=127)..	33

LIST OF FIGURES

Figure 2.1: Structure of the Health Belief Model (Glanz, Rimer & Lewis, 2008)	16
Figure 2.2: The theory of Health Belief Model (HBM) (adopted by Glanz, Rimer & Lewis, 2008).....	17
Figure 3.1: Overall Flow of the Data Collection Process	26

LIST OF ABBREVIATIONS

BP	-	Bell's Palsy
HBM	-	Health Belief Model
HREC	-	Human Research Ethics Committee
USM	-	Universiti Sains Malaysia
SPSS	-	Statistical Package for Social Science

**PENGETAHUAN DAN KESEDARAN MENGENAI PALSİ BELL DALAM
KALANGAN PELAJAR IJAZAH KEJURURAWATAN DI
UNIVERSITI SAINS MALAYSIA**

ABSTRAK

Palsi Bell (BP) ialah episod kelemahan otot muka atau lumpuh yang tidak dapat dijelaskan (Johns Hopkins Medicine, 2023). Ia adalah gangguan neurologi biasa yang boleh memberi kesan yang ketara kepada kualiti hidup seseorang. Kajian ini bertujuan untuk mengetahui tahap pengetahuan dan kesedaran BP dan perkaitannya dalam kalangan pelajar Sarjana Muda Kejururawatan di Universiti Sains Malaysia (USM). Data dikumpul menggunakan soal selidik yang ditadbir sendiri. Kajian penyelidikan ini melibatkan 127 pelajar sarjana muda kejururawatan daripada Pusat Pengajian Sains Kesihatan. Kajian ini dijalankan menggunakan kaedah persampelan mudah. Data yang dikumpul dianalisis secara statistik menggunakan perisian 'Statistical Package of Social Sciences' (SPSS) versi 27. Ujian yang digunakan dalam kajian ini ialah statistik deskriptif dan Pearson Chi-square. Keputusan menunjukkan bahawa lebih separuh daripada responden menunjukkan tahap pengetahuan yang lemah mengenai BP, $n=81$ (63.8%). Majoriti responden juga mempunyai kesedaran yang lemah terhadap BP (80.3%). Tambahan pula, hasil kajian ini mendedahkan bahawa terdapat perkaitan yang signifikan antara pengetahuan dan kesedaran BP, seperti yang ditunjukkan oleh nilai P yang rendah (<0.001). Kesimpulannya, tahap pengetahuan dan kesedaran BP yang rendah dalam kalangan pelajar kejururawatan sarjana muda merupakan isu serius yang perlu diberi perhatian. Jurang ini boleh menyebabkan diagnosis tertunda, diagnosis salah dan pengurusan yang tidak mencukupi, mengakibatkan hasil kesihatan yang buruk. Oleh itu, inisiatif pendidikan yang disasarkan dan kempen kesedaran adalah penting untuk meningkatkan kesedaran dan pengetahuan tentang BP, akhirnya meningkatkan penjagaan pesakit.

**KNOWLEDGE AND AWARENESS OF BELL'S PALSY AMONG
UNDERGRADUATE NURSING STUDENTS IN
UNIVERSITI SAINS MALAYSIA**

ABSTRACT

Bell's palsy (BP) is an unexplained episode of facial muscle weakness or paralysis (Johns Hopkins Medicine, 2023). It is a common neurological disorder that can have a significant impact on an individual's quality of life. This study aimed to determine the level of knowledge and awareness of Bell's Palsy and its association among undergraduate nursing students at USM. Data were collected using a self-administered questionnaire. This research study included 127 undergraduate nursing students from the School of Health Sciences. The study was conducted using a convenience sampling method. Data collected were statistically analysed using the SPSS software version 27. The tests used in this study were descriptive statistics and Pearson Chi-square. The results show that more than half of the respondents presented with poor levels of knowledge regarding Bell's Palsy, $n=81$ (63.8%). The majority of the respondents had also poor awareness of Bell's Palsy (80.3%). Furthermore, the results of this study revealed that there is a significant association between knowledge and awareness of Bell's Palsy, as indicated by the low P-value (<0.001). In conclusion, the low level of knowledge and awareness of Bell's Palsy among undergraduate nursing students is a serious issue that needs to be addressed. This gap can lead to delayed diagnosis, misdiagnosis, and inadequate management, resulting in poor health outcomes. Therefore, targeted educational initiatives and awareness campaigns are essential to improve awareness and knowledge of Bell's Palsy, ultimately enhancing patient care.

CHAPTER 1 INTRODUCTION

1.1 Introduction

The first chapter of the dissertation started with the background of the study, problem statement, research questions, research objectives, and hypotheses of the study. Finally, the significance of the study and the operational definition of key terms used in the study were described.

1.2 Background of the Study

The facial features of an individual play a crucial role in defining their identity and distinctiveness. The function of facial expressions in expressing emotions and social interactions is of utmost importance. Therefore, any impairment in the regulation of face muscles, in addition to physical handicap, can lead to significant social and psychological discomfort. Bell's palsy (BP) is an unexplained episode of facial muscle weakness or paralysis (Johns Hopkins Medicine, 2023). It begins suddenly and worsens over 48 hours (Johns Hopkins Medicine, 2023). This condition results from damage to the facial nerve (the 7th cranial nerve) (Johns Hopkins Medicine, 2023). Pain and discomfort usually occur on one side of the face or head (Johns Hopkins Medicine, 2023).

Bell's palsy is the most commonly encountered cranial nerve disorder, with an annual incidence of 20-35 per 100,000 population (Nemet & Vinker, 2015). The prevalence in men and women is equal, although the incidence of BP in late-term pregnant women has been reported to be higher (Charn, Subramaniam, & Yuen, 2013). The prevalence of BP was varying globally.

The aetiology of BP is an unknown but viral infection, vascular ischemia, or autoimmune disease has been postulated as possible pathomechanisms. Sometimes

swelling or inflammation of the cranial nerve can also cause BP. This condition can affect people of different ages, but it is more common in people between the ages of 16 and 60 (Naveed & Tasleem, 2014). There are several risk factors associated with BP, including age, pregnancy, epilepsy, obesity, hypertension, diabetes, respiratory tract infection, vaccination, and genetic susceptibility due to consanguineous marriages in Saudi Arabia (Alanazi *et al.*, 2022).

BP is typically identified when there is a sudden occurrence of one-sided facial weakness or complete paralysis affecting all the muscles on that side of the face. Other associated symptoms include dryness in the eye, changes in taste perception, pain around the ear, heightened sensitivity to sounds (known as hyperacusis), and reduced tear production. The disease usually progresses from the onset of symptoms to maximal weakness within three days (Greco *et al.*, 2012).

The medical treatment of BP was once extremely contentious, with various therapy regimens proposed over the years. Because the condition is known to be related to oedema and facial nerve inflammation. Blood tests are performed to rule out medical issues such as Lyme disease, which can cause BP. The myriad treatment options for BP include medical therapy (steroids and antivirals, alone and in combination), surgical decompression, and complementary and alternative therapies such as acupuncture (Baugh *et al.*, 2013). In addition to preventive therapy, a significant number of resources and research have been allocated toward addressing the issue of incomplete recovery in patients diagnosed with BP. The treatment options include electromyographic rehabilitation, botulinum toxin, oral prosthesis, and surgery (Charn, Subramaniam, & Yuen, 2013).

There are several studies was conducted on knowledge and awareness of BP. According to Alherabi et al. (2022), the overall awareness regarding BP was unsatisfactory. More efforts, including health education programs, should be made to improve public awareness regarding this disorder and to achieve favourable outcomes and avoid future complications of the condition. Besides, the knowledge of BP in students is not enough to dial uncertain mishap pining of the disease and they must be aware of the disease to treat others better (Naveed & Tasleem, 2014). Students majoring in health sciences will work in the healthcare industry, bringing with them skills and values that will shape the field's future.

1.3 Problem statement

A study reported that overall awareness regarding BP was unsatisfactory (Alherabi *et al.*, 2022). A previous study reported that there was a satisfactory knowledge of anatomy, diagnosis, and treatment as well as a sufficient awareness of BP among dentists in Riyadh City, Kingdom of Saudi Arabia (Al Meslet *et al.*, 2019). Unfortunately, the same study also reported a lack of knowledge among dentists in managing patients with BP that happens immediately after a dental procedure (Al Meslet *et al.*, 2019). However, a study also stated that most of the students are not familiar with the term “Bell’s palsy” instate they are familiar with the term “Laqwa” (Naveed and Tasleem, 2014). Knowledge of the anatomy and clinical importance of BP could aid in correct diagnosis and therapy. Therefore, it is very important for nursing students who will later become part of the health care team to be aware of any medical conditions that may occur to their patients due to iatrogenic causes.

Besides, a study has indicated that the knowledge of BP among local patients was varied (Reich, 2017). This is because, the most common worry among patients at the time

of presentation was a stroke (Reich, 2017). The diagnosis of BP can be challenging for doctors due to its similarity to acute stroke, which is often a prominent concern in their differential diagnoses. However, an understanding of both the origin and route of cranial nerve VII through the nervous system and its adjacent anatomical structures, as well as a detailed history, helps narrow down the differentials and pinpoint a diagnosis (Induruwa *et al.*, 2019). So, this study was conducted to correct people's understanding of BP where BP is not the same as a stroke. A set of questionnaires about knowledge and awareness of BP will be provided to evaluate the student's understanding of BP.

Next, to our knowledge, there is a lack of research on assessing the knowledge and awareness of BP among undergraduate students in Malaysia. Thus, the current study is crucial to fill the research gap accordingly.

1.4 Research Question

- i. What is the level of knowledge of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia?
- ii. What is the level of awareness towards Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia?
- iii. What is the association between knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia?

1.5 Research Objectives

1.5.1 General Objectives

- To determine the level and association of knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

1.5.2 Specific Objectives

- To determine the level of knowledge of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.
- To determine the level of awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.
- To identify the association between knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

1.6 Research Hypothesis

Hypothesis 1: There is no association between knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia. (**H₀**)

There is an association between knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia. (**H_A**)

1.7 Conceptual and Operational Definitions

Table 1. 1: Conceptual and Operational Definitions

Knowledge	Awareness, understanding, or information that has been obtained by experience or study and that is either in a person's mind or possessed by people generally (Cambridge Dictionary, 2019). In this study, it refers to undergraduate students' knowledge of Bell's palsy. A set of questionnaires related to knowledge of Bell's palsy will be provided.
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Awareness	Knowledge that something exists or understanding of a situation or subject at present based on information or experience (Cambridge Dictionary, 2023b). In this study, it refers to the undergraduate students' awareness regarding Bell's palsy. A set of questionnaires related to awareness of Bell's palsy will be provided.
Bell's Palsy	Bell's palsy is suddenly occurring paralysis that distorts one side of the face, caused by a lesion of the facial nerve (Collins English Dictionary, 2023). In this study, Bell's palsy is referred to as the selected disease topic that the researcher wants to focus on.
Undergraduate student	An undergraduate is a student in a university or college who has not received a first, especially a bachelor's, degree (Kelly, 2023). In this study, it refers to undergraduate nursing students who study at Universiti Sains Malaysia.

1.8 Significance of the Study

There are many studies implemented to determine the knowledge of Bell's palsy (BP) however it appears only a few studies specify to health science students. Therefore, this study aids in identifying knowledge and awareness of BP among undergraduate nursing students. The knowledge about the disease, understanding of signs and symptoms, risk factors, and complications allow health science students like nursing students to treat a patient with existing facial palsy and do the correct action in patient's treatment during

clinical posting. Besides, this condition can also help in improving patient health outcomes.

People's understanding of BP is very unsatisfactory. Some confuse BP for a stroke because it temporarily paralyses facial muscles, causing drooping and weakness on one side. According to a study, the most prevalent concern among patients at presentation was that of stroke (Charn, Subramaniam & Yuen, 2013). These two different conditions can cause the same problem which is single-sided facial paralysis. In addition, stroke and BP have different treatments, so it is important to know what conditions are at play. Therefore, this study was conducted to change the way people think about BP and stroke and increase their understanding of BP.

Current knowledge on BP remains limited, so this study aims to identify people's knowledge about BP. Assessing individuals' level of knowledge about BP is crucial for healthcare providers to develop impactful educational approaches aimed at enhancing public awareness and knowledge. This study also may contribute information and findings that can be used for future research as a baseline and references.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

This chapter reviewed a series of literature regarding the knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia (USM). The literature review was organized into several sections based on the main term of the research to convey the overall findings. The recent articles and related issues were included in this chapter. The chosen conceptual framework to guide this proposed study was discussed.

2.2 Bell's palsy

Bell's palsy (BP), named after the Scottish anatomist Sir Charles Bell, is the most frequent diagnosis linked to facial nerve palsy/paralysis as well as the most frequent acute mono-neuropathy (Zhang *et al.*, 2020). BP is a rapid unilateral facial nerve paresis (weakness) or paralysis (complete loss of movement) of unknown cause. The condition leads to the partial or complete inability to voluntarily move facial muscles on the affected side of the face (Baugh *et al.*, 2013).

Research studies globally have reported variations in the annual incidence rate (11–50 cases per 100,000) of BP (Hsieh, Wang & Lee, 2013; Kokotis & Katsavos, 2015; Yilmaz *et al.*, 2019). The national prevalence of BP in Saudi Arabia is unknown; however, regional incidence/prevalence has been reported in a few studies, such as 26.3–27.8 cases per 100,000 per year (2011–2012) in the Aljouf region (Jamil *et al.*, 2013) and 26.3 cases per 100,000 per year (2016–2017) in the Arar region (Alanazi *et al.*, 2017). According to Ismail (2017), the incidence of BP is 20 to 30 cases per 100,000 population. It is the most common condition of unilateral facial palsy and contributes 60 to 70% of

all cases. People of all ages are susceptible to BP, but middle-aged people are more commonly affected. According to the National Health Service, UK, 25–35 people out of 100,000 population experience BP each year (Alamrani *et al.*, 2020).

According to a study show that the pathophysiology of BP remains uncertain and is controversial. The most widely accepted mechanism is inflammation of the facial nerve during its course through the bony labyrinthine portion of the facial canal, which leads to compression and demyelination of the axons and disruption of the blood supply to the nerve itself. This mechanism has been supported by MRI studies (Nemet & Vinker, 2015).

The etiology of this condition is mostly idiopathic, with approximately 60–75% of the cases considered idiopathic, while other uncommon causes include head and neck tumors, infections, neurologic conditions, neoplasia, trauma, and congenital cases (Alherabi *et al.*, 2022). BP can be misdiagnosed if history and examination are not carefully taken and the misdiagnosis rate can be up to 10.8% (Alherabi *et al.*, 2022). The cause remains idiopathic but strongly associated with certain viral infections, resulting in nerve inflammation causing focal oedema, demyelination, and ischemia (Awantika & Prasad, 2022). According to various studies, certain risk factors like increased blood sugar, uncontrolled blood pressure, severe pre-eclampsia, migraine, and radiation exposure can contribute to the pathological mechanisms involved in the development of palsy and raise an individual's susceptibility to this condition (Bosco *et al.*, 2011; Aditya, 2014; Peng *et al.*, 2015; Khateri *et al.*, 2018).

Bell's palsy is an idiopathic, acute peripheral palsy of the facial nerve that results in muscle weakness on one side of the face, characterised by a sudden onset and unilateral facial paralysis, lower motor neuron weakness of the facial nerve with no other

neurological abnormalities and no readily identifiable cause. Other features may include facial creases and nasolabial fold disappear, the forehead unfurrows and the corner of the mouth drooping. The eyelids will not close and the lower lid sags; on attempted closure, the eye rolls upward (Al Meslet *et al.*, 2019). The disease can cause disfigurement of the face, impair the ability to eat, drink and speak, and seriously affect the patient's quality of life (Marsk, 2012).

As spontaneous recovery is usual, the treatment is still controversial, but medical treatment and therapies help relieve symptoms and hasten recovery. Prednisone and other oral corticosteroids reduce nerve swelling and may speed up the recovery of facial actions and expressions. When taken with corticosteroids, antiviral drugs such as acyclovir for herpes are known to hasten the healing. This combination has a short treatment period and is cost-effective thus is very often recommended unless contraindicated. Ear pain can be relieved with the use of analgesics (Awantika & Prasad, 2022). Aside from preventive therapy, many resources and research have been dedicated to the treatment of incomplete recovery among patients with BP. Treatment options include electromyographic rehabilitation, botulinum toxin, oral prosthesis, and surgery (Charn, Subramaniam & Yuen, 2013).

Approximately 9% of patients have some sort of sequelae following BP (Nemet & Vinker, 2015). Ophthalmic complications include lagophthalmos, keratitis, blinking difficulties, and decreased tearing (Nemet & Vinker, 2015). The recovery time from lagophthalmos or corneal exposure has received scant attention in the literature (Nemet & Vinker, 2015).

The persistent impairment of voluntary blinking and reduced eyelid motility might indicate an involvement of higher brain structures. In some patients, even as facial

functions appear to recover completely, residual facial weakness, synkinesis, and impaired blinking persist (Nemet & Vinker, 2015). Other complications related to BP are corneal dryness leading to visual loss, permanent damage to the facial nerve, and abnormal growth of nerve fibres (Warner, Hutchison & Varacallo, 2022).

2.3 Knowledge of Bell's palsy

A study was conducted in Karachi, Pakistan to assess the level of understanding of BP among students enrolled in the faculties of pharmacy, science, and arts (Naveed & Tasleem, 2014). The data reveals that among 120 students, a mere 61.67% of the participants demonstrated knowledge of BP (Naveed & Tasleem, 2014). The overall survey is based on the knowledge of degree students about a disease called Bell's palsy (Naveed & Tasleem, 2014). Students know signs and symptoms but have very little knowledge about medical treatments (Naveed & Tasleem, 2014). Instate they are more familiar with home remedies (Naveed & Tasleem, 2014). Most of the students have an opinion that the disease will not happen again in the future and some have an opinion that the patient will not be covered fully by the disease (Naveed & Tasleem, 2014). The study findings indicated that there was a lack of sufficient understanding among students of BP (Naveed & Tasleem, 2014).

Next, according to Al Meslet et al. (2019), the knowledge of anatomy, diagnosis and treatment of BP was satisfactory suggested a sufficient awareness. This study reported that the level of people's understanding of BP is quite different in some places (Al Meslet *et. al.*, 2019). Good knowledge is associated with providing practice for patient care. Knowledge of the anatomy and clinical significance of BP might be useful in making an accurate diagnosis as well as providing an appropriate treatment. The majority of participants showed an appropriate knowledge of BP (Al Meslet *et. al.*, 2019). Most of

the participants knew that facial nerve (7th cranial nerve) is affected in a patient with BP (87%) (Al Meslet *et. al.*, 2019). This study also stated that over half of the participants reported that BP is peripheral facial palsy (57%), one-third (33%) reported that BP affects both side of face while the majority (52%) reported that affect one side and 38% reported that BP is triggered by viral infection (Al Meslet *et. al.*, 2019). One-third reported that diabetes is a risk factor for Bell's palsy (33%) (Al Meslet *et. al.*, 2019). Furthermore, over half of the participants (53%) reported lagophthalmos (inability to close the eye completely) is the early ocular complication, one-third (33%) reported that in grade VI the patient's face is totally paralysis and 30% reported that incomplete eye closure happens in grade IV of BP (Al Meslet *et. al.*, 2019). Most of the participants reported that BP last up to 6 months (59%) (Al Meslet *et. al.*, 2019). While for knowledge regarding diagnosis and treatment of BP, approximately half of the participants reported that electroneurography study measures facial nerve degeneration in patients with BP (52%), 39% reported that the treatment is administered, corticosteroids is the most widely accepted (Al Meslet *et. al.*, 2019). The study also reported that the participants agreed that BP was not a permanent damage (66%) (Al Meslet *et. al.*, 2019).

Another cross-sectional study was conducted in Chennai-77, India (Sangar, Pandurangan & Ganapathy, 2020). Nearly 95 % of the students claimed that they have an excellent knowledge about BP and the remaining 5 % were not aware of the term BP (Sangar, Pandurangan & Ganapathy, 2020). About 93% answered that they are aware of the causes of BP and 7 % of the students answered that they have no clue about the causes of BP (Sangar, Pandurangan & Ganapathy, 2020). About 63% do not have an idea about the chances of recurrence for a BP patient and the rest 27 % of the students were confident that they were well versed with the precautions that should be followed while handling a BP patient (Sangar, Pandurangan & Ganapathy, 2020). Awareness regarding BP has to

be improved among dental students and they should be able to plan a proper treatment plan to manage BP in the future (Sangar, Pandurangan & Ganapathy, 2020).

2.4 Awareness of Bell's palsy

The overall awareness regarding Bell's palsy (BP) is unsatisfactory. More efforts, including health education programs, should be made to improve public awareness regarding BP and to achieve favourable outcomes and avoid future complications of the condition (Alherabi *et al.*, 2022).

A cross-sectional study reported a significant good awareness among 24.9% of participants aged 20-35 years compared with 10.8% of those aged more than 50 years (Alherabi *et al.*, 2022). In addition, 24.2% of women had good awareness of facial palsy in comparison with 12.6% of men (Alherabi *et al.*, 2022). Among the participants with a good awareness of BP, 43.8% received the information from books, 41.4% from healthcare workers, 30.8% from the internet or social media and 3.4% did not mention a specific source (Alherabi *et al.*, 2022). This result is contrary to the findings from a study conducted by Alamrani *et al.*, (2020) in five main regions of Saudi Arabia that reported that 32.6% of the participants aged 30–50 years had a good awareness of the disease.

A cross-sectional study was conducted in five main regions of Saudi Arabia (Alamrani *et al.*, 2020). Participants who had heard of BP were 73.6% and the sources were family/friends (28.6%) and social media (27.4%) (Alamrani *et al.*, 2020). Major reported causes of BP included viral (52.9%) and idiopathic (51.7%) symptoms (Alamrani *et al.*, 2020). The majority of participants identified unilateral facial weakness (41.7%) as a symptom and physiotherapy (63.9%) and steroids (49.6%) as potential therapies (Alamrani *et al.*, 2020). A clear majority (n = 300, 75.2%) of enrolled

individuals were identified as having poor awareness regarding BP when compared to 99 (24.8%) participants who had a good awareness level (Alamrani *et al.*, 2020).

A study showed that the awareness of BP among local patients is varied. The most prevalent concern among patients at presentation is stroke (Reich, 2017). This may be because the general population is more familiar with the symptoms of stroke and thus warier of developing this condition (Reich, 2017).

2.5 Association between knowledge and awareness of Bell's palsy

In some situations, the terms "awareness" and "knowledge" can be used interchangeably. However, there's a big difference between knowledge and awareness. The primary distinction between awareness and knowledge is that knowledge is associated with deep understanding and familiarity with a subject, whereas awareness is the state or condition of being aware or conscious.

According to a study conducted in Riyadh City, Kingdom of Saudi Arabia, the dental students and dentists' awareness of Bell's palsy (BP) was satisfactory (Al Meslet *et al.*, 2019). The participants generally have reasonable information about BP so, they are aware enough about the disease (Al Meslet *et al.*, 2019).

A study among pharmacy, science and arts faculties students at different universities in Karachi indicated that there is an association between knowledge and awareness of BP (Naveed & Tasleem, 2014). According to the findings, students' understanding of BP is insufficient to diagnose the condition accurately (Naveed & Tasleem, 2014). The study showed that awareness of the disease was crucial in treating BP (Naveed & Tasleem, 2014).

2.6 Theoretical and Conceptual Framework of the Study

The Health Belief Model (HBM) is one of the theoretical frameworks for comprehending behaviours that promote health. The goal of this model is to anticipate people's health-related behaviours. It has also been determined to be the appropriate theoretical foundation for this study. According to this approach, people's beliefs affect their actions or behaviours when they experience any sign of disease that affects their health. Furthermore, individual belief about health plays a role in determining health-related behaviour. Any person may take the necessary action if they feel threatened or at risk.

The Health Belief Model consists of several components which are perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cue to action, and self-efficacy. In perceived susceptibility, this model will predict that people will engage in behaviours to lower their risk of having a certain health condition if they believe they are prone to that problem. perceived severity refers to the subjective assessment of the seriousness of a health issue and its possible effects. An individual who perceives a given health problem as a severe issue is more likely to take action to prevent the health problem from occurring. For perceived benefits, it is impacted by the hoped-for outcomes of doing action. For perceived barriers. It refers to an individual's assessment of the challenges to changing behaviour. Cue of action is a readiness to take action after perceived susceptibility, benefit and self-efficacy is the self-motivation of the individual to execute the health behaviour to produce a positive outcome.

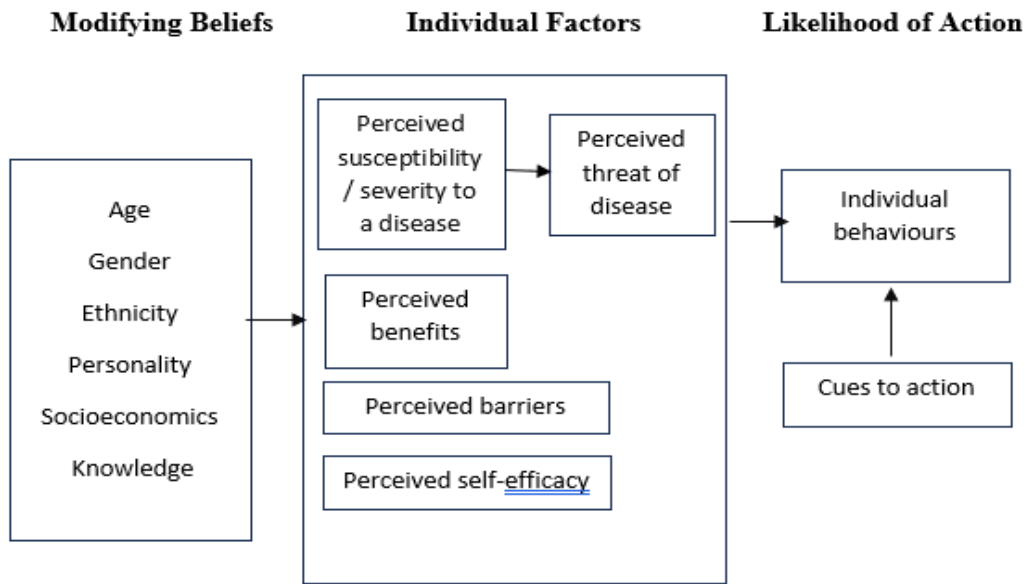


Figure 2. 1: Structure of the Health Belief Model (Glanz, Rimer & Lewis, 2008)

Based on the Health Belief Model (HBM), this study explores modifying factors which is knowledge. This exploratory study will also be carried out to determine the level of knowledge and awareness of Bell’s Palsy among undergraduate nursing students at Universiti Sains Malaysia. Applying the Health Belief Model in a research study on Bell's Palsy among undergraduate nursing students allows for a systematic approach to understanding and improving knowledge and awareness levels. By identifying modifying factors and designing targeted interventions based on HBM constructs, educational campaigns and interventions can effectively increase awareness and promote early detection and management of Bell's Palsy among undergraduate nursing students at Universiti Sains Malaysia. Figure 2.2 shows the adopted theory of HBM in this study.

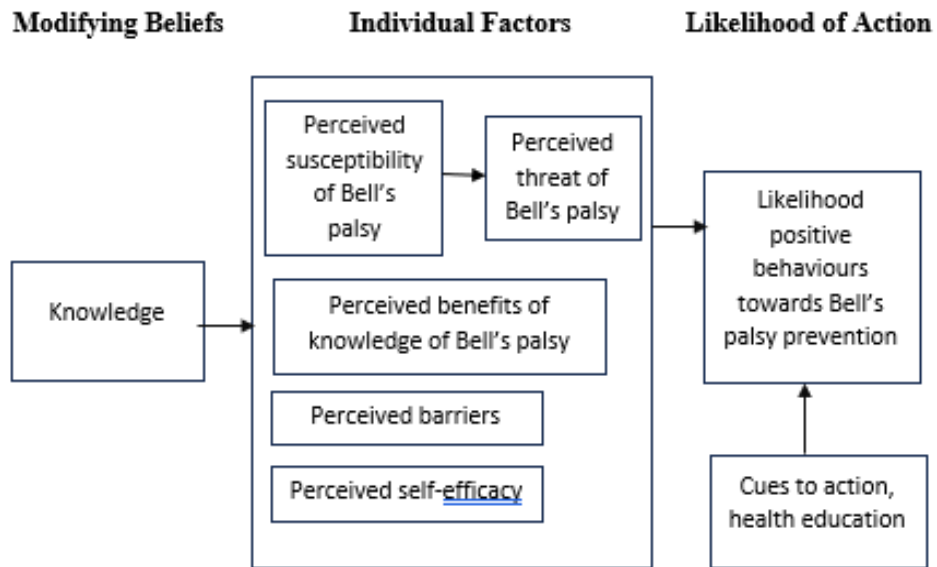


Figure 2. 2: The theory of Health Belief Model (HBM) (adopted by Glanz, Rimer & Lewis, 2008)

CHAPTER 3 RESEARCH METHODOLOGY

3.1 Introduction

This chapter contained all the information about the study in terms of research design, research duration, sampling plan, instrumentation, data analysis, expected outcome of the study, and ethical considerations.

3.2 Research Design

The study used a cross-sectional study design for data collection among undergraduate nursing students at Universiti Sains Malaysia (USM). A cross-sectional design is a descriptive study, where data is collected on the whole population at a single point in time to examine variables of interest (Saleh, 2018). This allowed researchers to measure the outcome and exposure of respondents at the same time based on the researcher's objective. The reason for using a cross-sectional study to this study is to get a wide range of perspectives. By including undergraduate nursing students with different backgrounds, and clinical experiences, this study can give a complete picture of what nursing students overall know about Bell's Palsy. This makes the findings more applicable to nursing students in general.

3.3 Research Location

The location of this study was conducted at Universiti Sains Malaysia (USM) specifically in the School of Health Sciences. USM's health campus proposed three schools which are the School of Health Sciences, the School of Dental Sciences, and the School of Medical Sciences. School of Health Sciences offered several courses, including a nursing program. The nursing program at USM proposed two types of programs, diploma and degree programs with different curricula.

3.4 Research Duration

The study was conducted for approximately six to eight months between October 2023 and August 2024. (APPENDIX D)

3.5 Research Population

This study was conducted among undergraduate nursing students at Universiti Sains Malaysia. From the population, this study will involve nursing students from the first to fourth year regardless of diploma or degree program. The total population of nursing students was 262 (=N) where 129 were degree students and 133 were diploma students.

3.6 Subject Criteria

3.6.1 Inclusion Criteria

1. An undergraduate and diploma nursing student at Universiti Sains Malaysia.
2. Aged 18 years and above.

3.6.2 Exclusion Criteria

1. Underlying psychiatric disease

3.7 Sampling Plan

3.7.1 Sample Size Estimation

The sample size was calculated for each study objective. The researcher had chosen a relatively large number of respondents to fulfill the researcher's *objective*.

In this study, the sample size was calculated using a website tool (https://wnarifin.github.io/ssc_web.html) for objectives 1, 2, and 3.

The first objective was to determine the level of knowledge of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

Proportion, $p = 0.92$ (Al Meslet *et al.*, 2019).

Sample Size Calculator (web)

1 proportion - Estimation

Proportion (p):	<input type="text" value="0.92"/>
Precision (\pm proportion):	<input type="text" value="0.05"/>
Confidence level $100(1 - \alpha)$:	<input type="text" value="95"/> %
Expected dropout rate:	<input type="text" value="10"/> %
<input type="button" value="Calculate"/> <input type="button" value="Reset"/>	
Sample size, $n =$	<input type="text" value="114"/>
Sample size (with 10% dropout), $n_{\text{drop}} =$	<input type="text" value="127"/>

The minimum sample size was 114 and after accounting for 10% dropout, the sample size was 127.

The second objective was to determine the level of awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

Proportion, $p = 0.95$ (Sangar, Pandurangan & Ganapathy, 2020).

Sample Size Calculator (web)

1 proportion - Estimation

Proportion (p):	<input type="text" value="0.95"/>
Precision (\pm proportion):	<input type="text" value="0.05"/>
Confidence level $100(1 - \alpha)$:	<input type="text" value="95"/> %
Expected dropout rate:	<input type="text" value="10"/> %
<input type="button" value="Calculate"/> <input type="button" value="Reset"/>	
Sample size, $n =$	<input type="text" value="73"/>
Sample size (with 10% dropout), $n_{\text{drop}} =$	<input type="text" value="82"/>

The minimum sample size was 73 and after considering a 10% dropout, the sample size was 82.

The third objective was to determine the association between knowledge and awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

Expected correlation, $r = 0.307$ (Dar *et al.*, 2022).

Sample Size Calculator (web)

Pearson's Correlation - Hypothesis Testing¹

Expected correlation (r):	<input type="text" value="0.307"/>
Significance level (α):	<input type="text" value="0.05"/> Two-tailed
Power ($1 - \beta$):	<input type="text" value="80"/> %
Expected dropout rate:	<input type="text" value="10"/> %
<input type="button" value="Calculate"/> <input type="button" value="Reset"/>	
Sample size, $n =$	<input type="text" value="81"/>
Sample size (with 10% dropout), $n_{\text{drop}} =$	<input type="text" value="90"/>

The minimum sample size was 81 and after considering 10% of dropouts, the calculated sample size was 90.

The highest estimated sample size was 127, therefore the total number of respondents for this study was 127 to represent the target population.

3.7.2 Sampling method

This study used the convenience sampling method. This is a non-probability sampling method in which units are selected for inclusion in the sample because they are the easiest for the researcher to access (Nikolopoulou, 2022). This method was chosen because it best meets the needs of the study as a respondent chosen was best to represent the population of the study. Therefore, this sampling method was quick, inexpensive, and convenient. The researcher only approached potential participants who were willing to participate in this study for data collection. Hence, the study participants who voluntarily agreed to participate, were given a set of questionnaires.

3.8 Research Instrument

3.8.1 Instrument

A set of questionnaires was used to obtain relevant data on the knowledge and awareness of Bell's palsy among undergraduate nursing students at USM. This questionnaire was adopted from Al Meslet et al. (2019) and Alamrani et al. (2020) with permission (Appendix B). This questionnaire was divided into 3 sections as explained as follows:

Part I: Socio-demographic Characteristics of the Participants

This section on characteristics of the participants consisted of six closed-ended questions that included age, gender, education level, years of study, finding out whether the participants had heard of Bell's palsy or not, and source of knowledge regarding Bell's palsy.

Part II: Knowledge regarding Bell's Palsy

This section consisted of twelve closed-ended questions. Nine questions relate to general knowledge regarding anatomy and Bell's palsy and three questions relate to knowledge regarding the diagnosis and treatment of Bell's palsy. This part provided information on the level of knowledge of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

Part III: Awareness of Bell's Palsy

This section consisted of thirteen closed-ended questions to assess the level of awareness of Bell's palsy among undergraduate nursing students at Universiti Sains Malaysia.

3.8.2 Translation of Questionnaire

The original questionnaire was written in English. As the population was undergraduate students who were well educated and could communicate and comprehend in English, the questionnaire was retained in the original English version.

3.8.3 Validity and Reliability

Reliability and validity are concepts used to assess the quality of research. Reliability is about the extent to which the results can be reproduced when the research is repeated under the same conditions while validity is about the extent to which the results really measure what they are supposed to measure (Middleton, 2019). In this study, the questionnaire on knowledge regarding Bell's palsy did not need to be validated as that questionnaire was adopted from the original article. No changes or removal of words in that questionnaire. Next, the questionnaire on awareness of Bell's palsy also did not need to be validated due to the questionnaire was adopted from the original article with high consistency and reliability. Some researchers have already used that questionnaire in their research articles. A study conducted in Saudi Arabia used the questionnaire of Awareness of Bell's Palsy and pretested questionnaires were used in data collection (Alamrani *et al.*, 2020). A study conducted in the Western Region of Saudi Arabia found that the questionnaire showed an acceptable level of reliability with a Cronbach's alpha of 0.73. Removing any of the questionnaire items did not improve the questionnaire's reliability, thus, all items were retained (Alherabi *et al.*, 2022). Another study conducted in the Al-Qassim Region, Saudi Arabia stated that a panel of three experts reviewed the questionnaire items to determine the validity and Cronbach's alpha of 0.73 showed its reliability (Altowayan *et al.*, 2023).

3.9 Variables

Variables were those attributes that were measured or manipulated in a study. The independent and dependent variables in this research study are shown below.

3.9.1 Variable Measurement

Dependent variable	Awareness of Bell's palsy
Independent variable	Knowledge of Bell's palsy

3.9.2 Variable Scoring

Part I: Socio-demographic Characteristics of the Participants

This section consisted of six closed-ended questions representing demographic data such as age, gender, education level, years of study, finding out whether the participants had heard of Bell's palsy or not, and the source of knowledge about Bell's palsy. Descriptive data frequency (n), percentages (%), mean and standard deviation (SD) were presented.

Part II: Knowledge regarding Bell's Palsy

This section consisted of twelve closed-ended questions to determine the level of knowledge of Bell's palsy among respondents. Multiple correct answers can be chosen from nine questions on knowledge about anatomy and Bell's palsy and three questions on knowledge regarding the diagnosis and treatment of Bell's palsy. The respondent's knowledge of Bell's palsy was evaluated in terms of the anatomy of Bell's palsy, diagnosis, and treatment of Bell's palsy. A wrong or 'I don't know' answer was scored zero and a correct answer was scored one, with a total score of twelve points calculated for each respondent. Bloom's cut-off point was used to categorise knowledge into three