UNIVERSITI PUTRA MALAYSIA

INTERRELATIONSHIPS OF BRAIN LOCATION, PARENTS' TRAIT ANXIETY, SEX AND TRAIT ANXIETY AMONG ANXIOUS CHILDREN IN KUALA LUMPUR, MALAYSIA

CHEONG CHEN CHEN

FEM 2022 4

INTERRELATIONSHIPS OF BRAIN LOCATION, PARENTS' TRAIT ANXIETY, SEX AND TRAIT ANXIETY AMONG ANXIOUS CHILDREN IN KUALA LUMPUR, MALAYSIA

By

CHEONG CHEN CHEN

Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in Fulfilment of the Requirements for the Degree of Master of Science

October 2021

Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

INTERRELATIONSHIPS OF BRAIN LOCATION, PARENTS' TRAIT ANXIETY, SEX AND TRAIT ANXIETY AMONG ANXIOUS CHILDREN IN KUALA LUMPUR, MALAYSIA

By

CHEONG CHEN CHEN

October 2021

Chair : Asmidawati binti Ashari, PhD
Faculty : Human Ecology

Over recent year, the prevalence rate of anxiety had increased consistently. Existing research recognizes the critical role played by the biological attributions of risk factors for anxiety as it had formed the first anxious personality of trait anxiety since childhood. However, the increased prevalence rate for anxiety disorder remains unresolved and some of the biological attributed risk factors remained unidentified. Therefore, the study aims to study the relationships between brain location, parents' trait anxiety and sex with trait anxiety among anxious Chinese children in Kuala Lumpur. A cross-sectional study using convenient sampling was carried out among 212 Chinese children aged between age eight to 13 years old with high trait anxiety. Data for this study were collected using self-administered State-Trait Anxiety Inventory for Children-Trait Scale (STAIC-T) and State-Trait Anxiety Inventory-Trait Scale (STAI-T) to measure the trait anxiety score for children and parents respectively. Besides, an objective measurement of brain electrical activity with Electroencephalogram (qEEG) brain mapping were adopted to identify the associated brain locations quantitatively according to International 10-20 System. Data analysis was conducted using IBM Version 2.0 Statistical Package for the Social Sciences (SPSS) which involved descriptive and inferential statistical analyses. Results showed that there was a significant relationship between all the locations at prefrontal cortex (Fp1, Fp2, F7, F8, F3, F4) and temporal lobe (T3, T4) with trait anxiety among children. Specifically, brain location F8 was the unique predictor for trait anxiety among children. Besides, results showed that there was a significant positive relationship between parents' trait anxiety level with children's trait anxiety level. In term of sex, there was a mean difference in trait anxiety level with females showed higher trait anxiety level. Findings from present study revealed that brain location, parents' trait anxiety and sex played a role in affecting the trait anxiety level of individual since born. Findings from this research highlighted that identification of biological vulnerability among children

could provide inputs which can assist in designing preventative action and early intervention to reduce the trait anxiety among Chinese children in Kuala Lumpur.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

HUBUNGAN ANTARA LOKASI OTAK, SIFAT KEBIMBANGAN IBU BAPA DAN JANTINA TERHADAP SIFAT KEBIMBANGAN DI KALANGAN KANAK- KANAK DI KUALA LUMPUR, MALAYSIA

Oleh

CHEONG CHEN CHEN

Oktober 2021

Pengerusi : Asmidawati binti Ashari, PhD
Fakulti : Ekologi Manusia

Sejak kebelakangan ini, kadar kebimbangan telah meningkat secara konsisten. Kajian sedia ada telah mengenalpasti peranan penting yang dimainkan oleh atribusi biologi faktor risiko untuk kebimbangan kerana ia telah membentuk permulaan personaliti kebimbangan sejak kecil. Namun, peningkatan kadar prevalen untuk gangguan kebimbangan masih tidak dapat diselesaikan dan beberapa faktor risiko biologi masih tidak dapat dikenal pasti. Oleh itu, kajian ini bertujuan untuk mengkaji hubungan antara lokasi otak, sifat kebimbangan ibu bapa dan jantina dengan sifat kebimbangan dalam kalangan kanak-kanak Cina di Kuala Lumpur. Kajian keratan rentas ini menggunakan persampelan kemudahan telah dijalankan ke atas 212 orang kanak-kanak berbangsa Cina berumur lapan hingga 13 tahun dengan sifat kebimbangan yang tinggi. Data bagi kajian ini diperolehi menggunakan pengisian kendiri borang Skala Inventori Sifat-Pewarisan Kerisauan Kanak-Kanak dan Skala Inventori Sifat-Pewarisan Kerisauan Dewasa untuk mengukur skor sifat kebimbangan untuk kanak-kanak dan ibu bapa masing-masing. Selain itu, pemetaan otak electro-encelophalogram kuantitatif (qEEG) diadaptasi untuk mengenalpasti aktiviti elektrik otak secara kuantitatif menurut Sistem 10-20 Antarabangsa. otak. Analisis statistik dijalankan menggunan perisian IBM versi 2.0 Statistical Package for the Social Sciences (SPSS) yang melibatkan analisi deskritif dan analisis inferens. Dapatan kajian menunjukkan terdapat hubungan yang signifikan antara semua lokasi di korteks prefrontal (Fp1, Fp2, F7, F8, F3, F4) dan lobus temporal (T3, T4) dengan kebimbangan dalam kalangan kanak-kanak. Secara khususnya, lokasi otak F8 adalah peramal unik untuk sifat kebimbangan. Dapatan kajian juga menunjukkan terdapat hubungan positif yang signifikan antara tahap sifat kebimbangan ibu bapa dengan tahap sifat kebimbangan anak-anak. Dari segi jantina, keputusan kajian menunjukkan bahawa terdapat perbezaan jantina bagi skor sifat kebimbangan dalam kalangan kanak-kanak dengan perempuan menunjukkan sifat kebimbangan yang lebih tinggi. Dapatan kajian menunjukkan bahawa aktiviti elektrik otak,

keturunan dan jantina memainkan peranan penting dalam mempengaruhi tahap sifat kebimbangan individu sejak dilahirkan. Hasil kajian ini menekankan bahawa pengenalpsti risiko kelemahan biologi dalam kalangan kanak-kanak dapat memberi input yang dapat membantu dalam merekabentuk tindakan pencegahan dan intervensi awal bagi mengurangkan sifat kebimbangan dalam kalangan kanak-kanak Cina di Kuala Lumpur.

ACKNOWLEDGEMENTS

First and foremost, I am really grateful to God for the blessings that have been given to me and I have the opportunity to complete this research entitled "Interrelationships of Brain Location, Parents' Trait Anxiety, Sex and Trait Anxiety among Anxious Children in Kuala Lumpur, Malaysia.

Next, I would like to express my deepest gratitude and appreciation to my research supervisor committee, Dr. Asmidawati binti Ashari, Dr Rahimah and Dr Wan Aliaa who has showed patience in providing valuable suggestions and advises throughout the research. It motivated me to overcome challenges in completing this research. Lastly, thanks to my site supervisor, Hiro Koo Kian Yong who supervised me in administering qEEG brain mapping and provide technical support for me to complete this research.

Millions of appreciations to New Mind Brain Health Centre for approving my permission to carry out the data collection process there. Thanks for providing a good and well-equipped environment for me to conduct my study. Special thanks to all the staff there who had helped me so that I can complete my data collection smoothly.

Besides, I am really grateful to have my beloved family and friends who are always by my side and support me. I dedicate this thesis to my parents, siblings and loved ones. I would also like to say big thanks to my fellow course mate, Tun Ju Ern who had gone through the journey of completing this research with me.

On top of that, million thanks to Geran Putra-IPS, University Putra Malaysia for funding me to conduct this research. Those funds lighten my financial burden to prepare all the research materials and conduct this research.

Last words may God bless all of them and indeed, this research provided insight for me as a master student and also as a human being. Thank you very much.

This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

Asmidawati binti Ashari, PhD
Senior Lecturer
Faculty of Human Ecology
Universiti Putra Malaysia
(Chairman)

Rahimah binti Ibrahim, PhD
Associate Professor
Faculty of Human Ecology
Universiti Putra Malaysia
(Member)

_____
ZALILAH MOHD SHARIFF, PhD
Professor and Dean
School of Graduate Studies
Universiti Putra Malaysia

Date:19th May 2022

Declaration by the Graduate Student

I hereby confirm that:

- this thesis is my original work;
- quotations, illustrations and citations have been duly referenced;
- this thesis has not been submitted previously or concurrently for any other degree at any institutions;
- intellectual property from the thesis and the copyright of the thesis are fully-owned by Universiti Putra Malaysia, as stipulated in the Universiti Putra Malaysia (Research) Rules 2012;
- written permission must be obtained from the supervisor and the office of the Deputy Vice-Chancellor (Research and innovation) before the thesis is published in any written, printed or electronic form (including books, journals, modules, proceedings, popular writings, seminar papers, manuscripts, posters, reports, lecture notes, learning modules or any other materials) as stated in the Universiti Putra Malaysia (Research) Rules 2012;
- there is no plagiarism or data falsification/fabrication in the thesis, and scholarly integrity is upheld in accordance with the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2015-2016) and the Universiti Putra Malaysia (Research) Rules 2012. The thesis has undergone plagiarism detection software

Signature: _____ Date: _____

Name and Matric No.: _____

Declaration by Members of the Supervisory Committee

This is to confirm that:

- the research and the writing of this thesis were done under our supervision;
- supervisory responsibilities as stated in the Universiti Putra Malaysia (Graduate Studies) Rules 2003 (Revision 2015-2016) are adhered to.

Signature: _____
Name of Chairman of Supervisory Committee: _____

Signature: _____
Name of Member of Supervisory Committee: _____

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

B40	Below 40 for lower class
BAI	Beck Anxiety Inventory
BLA	Basolateral complex
BMI	Body Mass Index
CeA	Central nucleus of the amygdala
CD	Crohn Disease
CP	Cerebral Palsy
CRF	Corticotropin-releasing factor
DASS	Depression Anxiety Stress Scales
DMN	Dorsal motor nucleus
EEG	Electroencephalogram
ERP	Event related Potential Recording
fMRI	Functional Magnetic Resonance Imaging
GABA	Gamma-aminobutyric Acid
GAD	Generalized Anxiety Disorder
Hz	Hertz
IBD	Inflammatory Bowel Disease
LC	Locus ceruleus
LH	Lateral hypothalamus
M40	Middle 40 of middle class
MDD	Major Depressive Disorder
MPA	Malaysian Psychiatric Association
NRSM	National Suicide Registry Malaysia
OCD	Obsessive-Compulsive Disorder

PAG	Periaqueductal gray
PBN	Parabrachial nucleus
PD	Panic Disorders
PDA	Panic Disorders with Agrophobia
PET	Positron Emission Tomography
PTSD	Posttraumatic Stress Disorder
PVN	Paraventricular nucleus
qEEG	Quantitative Electroencephalogram
RPC	Reticular formation
SES	Socioeconomic Status
SPSS	Statistical Package for the Social Sciences
STAI	State-Trait Anxiety Inventory
STAIC-T	State-Trait Anxiety Instrument for Children-Trait Scale
SUD	Substances Use Disorders
T20	Top 20 of upper class

CHAPTER 1

INTRODUCTION

1.1 Introduction of Chapter

This chapter explained in detail the background of the study, the problem statement, research question, objectives, and the study's significance in the field of mental health. The subsequent section covered the conceptual and operational definitions of key terminology followed by the theoretical approaches used to investigate the research question. Lastly, this chapter concluded with an outline of the proposed hypothesis.

Anxiety disorders are chronic, disabling conditions that are distributed across the globe. Thus, anxiety has received much attention in the past decade due to increasing incidence in the world as well as in the burden and implication that is associated with untreated illnesses. Recent statistics from the World Economic Forum describes anxiety disorders as the number one of mental health issue around the world with an estimated 275 million of people being diagnosed with anxiety disorders which is accounted for four percent of the global population (Fleming, 2019). In average, per country, the spread of anxiety disorder is approximately between 2.5 and 6.5 percent of the population, and there is a disproportionate between sex as women are at a higher rate of having anxiety with 62 percent of the world anxiety population were female (Fleming, 2019). This could be the result of the distinct types and fluctuation of hormone in female affected the neurogenesis activity in hippocampal which responsible for regulating anxious behaviour (Marques, Bevilaqua, Fonseca, Nardi, Thuret & Dias, 2016).

Besides more female are reported to have an anxiety, it is crucially to note that anxiety have become to affect children and adolescent mental health The World Health Organization (WHO) states that between 10 to 20 percent of children worldwide have a mental disorder and nearly half of these disorders start at age 14 year old (World Health Organization, 2020). In Malaysia, statistics showed that a total of 29% Malaysian were suffered from anxiety disorder by the year of 2017 (Malaysian Psychiatric Association, 2017). This situation not only is not only affecting older age group but also among children. According to national Health & Morbidity Survey 2018, it was reported that approximately 16% of Malaysian children are exhibiting anxiety symptoms which had affected their developmental stage (National Health & Morbidity Survey, 2018). Previous studies had highlight that anxiety disorders usually begin in childhood, adolescence, or early adulthood and continue until they peak at middle age before decreasing with age (Bandelow & Michaelis, 2015; Ganella et al. (2017). While the median onset age of anxiety disorders is 11 years old, specific phobias can start earlier with separation anxiety disorder starting at 7 years old and social anxiety disorder starting at age 13 (Bandelow & Michaelis, 2015). It showed that

childhood stage is the first indication stage for anxiety which resulted childhood phase as the core risk phase for anxiety.

Although many anxiety disorders can be treated with either psychological therapy or medication (Bandelow & Michaelis, 2015), if left untreated, the impact it can have on society and the healthcare system is immense. It can impact growth and development, education and employment, as well as the potential for leading a fulfilling life (World Health Organization, 2020). The WHO has found that only half of the cases of anxiety disorders are recognized and only one third of patients ever receive any treatment (Bandelow & Michaelis, 2015). Children also face serious challenges including stigma and discrimination, isolation, and lack of access to interventions (World Health Organization, 2020). As such, studying anxiety disorders in childhood stages is an important place to start, especially in understanding the factors that contribute to anxiety among children.

1.2 Background of study

Anxiety has become more prevalent across many nations around the world. As noted, the 21st century has been described as an era of anxiety (Malcolm, 2015). Globally, it has surpassed depression as the leading cause of disability affecting approximately 275 million people (Fleming, 2019). According to the Malaysian National Health and Morbidity Survey conducted in 2015, the number of depression and anxiety children increased nearly threefold from 10.7 percent in 1996 to 29 percent in 2015 (Yeoh, Tam, Wong, & Bonn, 2017). In nations where there is less access to healthcare services including psychiatric care, mental disorders go under-diagnosed (Baranne & Falissard, 2018). While modern society has achieved a higher economic status with technological advances and modernization, this situation has also created a parallel psychosocial challenge, which leads to stress, conflicts, unhappiness, as well as unproductive or counterproductive behaviors (Spielberger, 2013). Consequently, anxiety has become one of today's modern plagues. Since the causes of anxiety are varies and remain unresolvable, having awareness and knowledge of it are crucial.

To date, emotional disorders such as anxiety and depression are one of the most common mental health issues among children. Previous research indicates that early onset of anxiety has been associated with its perilous development and childhood is a risky stage for the development of this mental illness (Katja, Susanne & Daniel, 2009; Lippman, Moore & McIntosh, 2011; World Health Organization, 2005). Over the past decades, the risk factors for anxiety in children has become a significant issue of concern. Based on the literature, there were different factors that attributed to anxiety level among children, such as sex, age, body mass index (BMI), childhood trauma, family history of anxiety disorders, and predisposed trait have played a role in the early onset of anxiety disorders (DeJesus et al., 2016; Mohammadi et al., 2019; Stanczykiewicz, Banik, Knoll, Keller, Hohl, Rosińczuk, & Luszczynska, 2019; Washington, Rose, Coard, Patton, Young, Giles, & Nolen, 2016).

Mental health problems among children cause distress and can have wide-ranging impacts including negative effects on educational attainment and social relationships, as well as affecting life chances and physical health (Goodman, Joyce & Smith, 2011; Green, 2011). People who suffer from mental illnesses such as anxiety suffer interference with their day-to-day lives, their perception to happiness, and their ability to live productively (Galvez-Sánchez, Montoro, Duschek, & Reyes del Paso, 2020).

Scholars have summarized the onset of childhood anxiety based on different approaches. The "biology of fear- and anxiety-related behaviors framework" argued that vulnerability to psychopathology anxiety appears to be a consequence of predisposing factors or traits, which resulted from numerous gene-environment interactions during developmental stage, specifically start from prenatal stage (Thierry Steimer, 2002). These predisposed traits formed the first anxious personality in children and increase their vulnerability towards stress during the developmental stage.

On top of that, ever increasing of anxious children in Malaysia are resulting in negative effects on the individual as well as on institutions like the family and the community (Abend et al., 2018). According to Wong et al, (2016) , the anxious feelings in child can cause serious impact on physical and mental (Wong, Sultan Shah, Teng, Lin, Majeed & Chan, 2016). This is especially paramount for children and adolescence, the emotional pain of anxiety may change to physical discomforts like headaches, irritable bowels, trembling, and mental discomforts including feelings of tense, stress, and intrusive thoughts (Sachs-Ericsson, Sheffler, Stanley, Piazza, & Preacher, 2017). Anxiety disorders can also increase the comorbidity with other mental illnesses that can worsen the condition (Essau, Lewinsohn, Lim, Ho, & Rohde, 2018). Besides, anxiety is associated with posing substantial interference in young peoples' social, educational, and family lives which could increase further risk for the development of other mental health problems in later life (Martino et al., 2019; Moreira, Bouissou Morais Soares, Teixeira, Simões e Silva, & Kummer, 2015; Hill, Waite, & Creswell, 2016).

Despite adequate amount of stress could act as a motivation for children to perform but when intense fear and physical discomfort emerges, the condition can worsen and affect their mental cognitive abilities including attention, comprehension, processing, reasoning and understanding (Steinmayr, Crede, McElvany, & Wirthwein, 2016). As a result, the prolong exposure to fear during childhood stage affected their academic performance in school and lead to some learning disabilities.

In addition to biological and physical symptoms, anxiety in children can also lead to psychological problems. Children with high anxiety symptoms can face some difficulties in socializing with others in their peer age group or even suffer from social anxiety disorder. Fearful and anxious children with low self-esteem tend to be shy and experience social withdrawal with a negative self-image, which

can affect their normal development and their ability to socialize with their environment (Chapman, Halldorsson, & Creswell, 2020). For instance, children with social anxiety disorder reported to have fewer friendships as well as less intimacy, companionship, and support in their close friendships (Fox, Buzzell, Morales,Valadez, Wilson, & Henderson, 2020). Thus, it showed that anxiety disorders had interrupted and affected the sufferer to a severe extent. Physical and mental disturbances of anxiety during childhood stage interrupted with the normal developmental stages as children may perceive this world negatively with intense fear.

To note, anxiety does not just impact the child sufferer alone, but causes negative effects on the family and community as well. Research shows that having a school-age child with a psychiatric condition can impact family functioning in negative ways including increased worry, loss of income due to added costs, strained family and social relationships, as well as restricted activities (Towe-Goodman, Franz, Copeland, Angold, & Egger, 2014). There is evidence to suggest that how the family perceives the level of impact also effects the level of treatment that the child will receive. Research with children between the ages of 6 to 18 years old found that the impact on their caregivers became a key predictor of whether the child would receive any type of treatment including diagnostic treatment. While only 72 percent of school-aged children receive counselling, the number is even lower among younger children with anxiety disorders (Towe-Goodman, Franz, Copeland, Angold, & Egger, 2014).

Moreover, the impact of anxious children for the country at a national and global level are also significant. For the nation, anxious children incur an enormous financial burden in terms of economic costs, disability, and personal suffering (Smoller, 2017). While the impacts of the increasing of prevalence rate are felt worldwide, they are of greatest concern in underdeveloped and developing nations where diagnosis and access to treatment are limited. On a global level, the cost of mental health is estimated to reach nearly $16 trillion by 2030, which is especially hazardous to low-and-middle-income countries where affordable healthcare is less accessible (Fleming, 2019). Statistics show that in high-income nations, 35 to 50 percent of people with mental health disorders do not receive any treatment and in lower-income countries, this number is significantly high with 76 to 85 percent of people not receiving any treatment (Fleming, 2019).

According to Diagnostic and Statistical Manual of Mental Disorders (DSM–5), anxiety children are assessed and diagnosed with different types of anxiety disorders based on different symptoms and dysfunction. They included separation anxiety disorder, selective mutism, specific phobia, social anxiety disorder (social phobia), panic disorder, panic attack (specifier), agoraphobia, generalized anxiety disorder, substance/medication-induced anxiety disorder, anxiety disorder due to another medical condition, other specified anxiety disorder, and unspecified anxiety disorder (American Psychiatric Association, 2013). However, not necessarily for all anxious children to be diagnosed with anxiety disorder but they may exhibit different anxious symptoms. Although they are not meeting the criteria to be diagnosed with anxiety disorder but still, the

chronic anxious feeling had resulted in significant distress, or impairs social, occupational, or other important areas of functioning among children if they are not being intervene since young.

In addition to categorizing anxiety disorders by symptoms, anxiety disorders can also be divided into state anxiety and trait anxiety, which explain anxiety disorders in term of duration (Spielberger, 1966). Psychophysiological state anxiety, or state anxiety, is used to describe anxiety that is caused from a psychological or physiological reaction from a specific moment or situation whereas personality trait anxiety, or trait anxiety, is used to describe a trait of personality that is caused by their individual differences in how they respond negatively to situations or stimuli in their environment (Leal, Goes, da Silva, & Teixeira-Silva, 2016). Since trait anxiety is stable over time, people with anxiety disorders often have a higher trait anxiety than people who do not suffer from this mental illness (Leal, Goes, da Silva, & Teixeira-Silva, 2016).

Personality trait anxiety in children is the focus of this research because there is limited research in this field that is current and that reflects a modern environment. Since state anxiety shows a person's tendency to experience negative emotions including worry and fear, understanding trait anxiety can also help with identifying the predictors of certain events as well as finding coping mechanisms. For instance, current studies mainly focus on anxiety "disorder" but not on anxiety itself. Researchers and even psychologists have put their efforts in identifying the pathological characteristics of anxiety disorder rather than on the personal characteristics of the individuals who suffer from anxiety (Majtyka, 2015).

As such, the attention of this research will be drawn to the other aspect of anxiety, which is on the emotional and personality aspect of the children who suffer from anxiety symptoms. Trait anxiety is the long-term anxious feeling that is experienced by the individual and as such, it is hard to reverse. This prolonged state of anxiousness is then adopted by the individual and forms anxious personality disorder, and it will cease even with the removal of threats (Leal, Goes, da Silva, & Teixeira-Silva, 2017; Weger, & Sandi, 2018). The impact of trait anxiety is much more impactful for children as this is the default personality that they exhibit. Trait anxiety can also result in attentional biases that emphasize the threatening information further worsening the anxious feeling in children (MacLeod, Grafton, & Notebaert, 2019; Waechter, & Stolz, 2015). As a result, trait anxiety among children will be studied in detail in relation to other related variables.

Averill (2015) has highlighted that biological attribution or predisposed trait anxiety was the most common aspect of anxiety disorder in children because it comes at the time of birth whereas the psychological and social aspects come later in their life. By analyzing the associated biological attribution of risk factors of children with anxiety as well as the commonalities in the etiologies of anxiety

disorders, this present study can provide clues for the development of unified preventive interventions.

Furthermore, research on the brain of a child is significant because the brain is the main control center of the body, and it can transmit fear and other anxious signals to the individual (Antoniadis & McDonald, 2001). Since there is a direct effect of electrical brain activity in human behavior and brain function, identifying the problematic parts that are responsible for certain anxiety disorders can be a valid and reliable method of detection. As such, prefrontal cortex and amygdala in temporal lobe are the brain locations that responsible for the evoke of fear response and anxiety (Greening, & Mitchell, 2015).

In conclusion, anxiety disorders have reached an alarming rate nowadays with various impacts on the individual, the family, and the nation as a whole. This is especially significant in developing countries across Asia such as Malaysia where anxiety disorders are the most reported and highest growing mental health issue (Khaiyom, Mukhtar, & Po, 2019). Mental health illnesses are predicted to be the next leading cause of health problems in the country after cardiovascular diseases as the economy develops and more people experience work and family pressures (Khaiyom, Mukhtar, & Po, 2019). Statistics from a national health report show that between 1996 to 2015, the number of people diagnosed with a mental health illness increased by 200 percent with depression and GAD increasing by 17 percent from 2011 to 2015 (Cheah, Azahadi, Phang, & Manaf, 2019). Furthermore, data shows that the rate of prevalence among students and general populations is between 1 to 67.6 percent (Khaiyom, Mukhtar, & Po, 2019). With the rise in cases, there are detrimental impacts on the country's healthcare system and ability to offer appropriate treatment.

While much of the research on anxiety in Malaysia centers on adults, this study is focused on childhood personality trait anxiety. As a vulnerable group, this study intends to look at the biological attribution of anxiety and brain location among anxious children. By identifying the biological attributed risk factors of anxious children, this study can contribute to the literature on reducing the onset of anxiety in childhood and on helping to implement effective treatment plans and customized interventions.

1.3 Statement of Problem

As noted, anxiety has become a prevailing condition in society. Worldwide, approximately 272.2 million people were found suffering from anxiety disorders in 2010 (Baxter et al., 2014), a number that increased to 275 million in 2018 (Fleming, 2019). The prevalence rate for anxiety disorders have steadily increased and has become the most prevalent form of a psychopathology disorder globally (Iverach, Jonesb, McLellana, Lynehama, Menziesc, Onslowc, & Rapee, 2016; Bandelow, & Michaelis, 2015). The National Survey of Mental Health and Wellbeing in 2007 reported a 11.8 percent, 12-month prevalence and

a 20.0 percent lifetime prevalence of anxiety disorders (McEvoy, Grove & Slade, 2011). In Malaysia, the Malaysian Psychiatric Association (MPA) has reported similar prevailing conditions with the rate of anxiety disorders increasing to 29 percent from 10.7 percent between 1996 and 2015 (Baranne & Falissard, 2018). By comparing between three major races of Malay, Chinese and Indian, Chinese children experienced the higher level of anxiety that caused by a variety of factors (Shamsuddin et. al, 2013). Traditionally in Chinese population, under the influences of Confucianism and the Chinese belief of filial piety, Chinese parents are more likely to use strict discipline in parenting as well as administer physical punishment on children in order to achieve a desirable target which had increased the anxiety level of children in a great extend (Lin, Li, Chi, Wang, Melissa Du & Fang, 2015). On top of that, Chinese have the highest rate of suicides at 48 percent followed by the Indians, 21 percent, Malays, 18 percent and other races, 13 percent (National Suicide Registry Malaysia Report, 2010).

In recent year, anxiety had become an issue of concern and there are numbers of interventions had been carried out in order to help those who suffer from anxiety disorders. However, this issue has still not been fully addressed yet, as anxiety still engulfs people from different demographics and age groups on an international level. According to the American Psychiatric Association (APA, 2013), anxious symptomology has resulted in significant impairment in overall functioning and reduction in quality of life. Physically, anxious people tend to suffer from stuttering, asthma, and irritable bowel movements (Dudeney, Sharpe, Jaffe, Jones, & Hunt, 2017). In Malaysia, the prolong exposure to anxiety among children are more obvious in city areas and reported to have higher suicidal rate due to stress (Ibrahim, Amit, & Suen, 2014). Mentally, they are suffering from a feeling of prolonged worry, which has interrupted and interfered with their daily lives. Additionally, early onset of anxiety has been associated with abnormal childhood development, suggesting that childhood is a high-risk phase for anxiety with increased of prevalence rate (Erskine, Baxter, Patton, Moffitt, Patel, Whiteford, & Scott, 2016). In addition, childhood anxiety disorders often run a chronic course, are associated with substantial interference in young peoples' social, educational, and family lives, and are a risk for the development of other mental health problems in later life (Martino et al., 2019; Moreira, Bouissou Morais Soares, Teixeira, Simões e Silva, & Kummer, 2015; Hill, Waite, & Creswell, 2016). It is clear that suffering anxiety symptoms from childhood not only affects their current life but also their later life in a physical and mental way. Therefore, with the global rising rate of anxiety disorders and its negative consequences for nations, more studies need to be done to have a better understanding about this prevailing condition. Anxious individuals only seek for help when the anxious symptoms are significantly expressive and obvious at the later stage, the intervention process being delayed which reduce the effectiveness of treatment. Many adults nowadays will only consider their mental health when physical symptoms manifest, yet research suggests that it can be traced back to childhood experiences.

On top of that, past studies also drawn more focus to clinical setting by recruiting children who had been diagnosed with anxiety disorder, children with anxiety symptoms somehow are being left out (Wong et al.,2016). As such, it is

significantly crucial to study anxiety from a childhood angle instead of relying only on the anxious origins of adults. This can contribute to the field of preventative treatments instead of just reactionary treatments. With less focus on personality trait anxiety during the early stage, the most basic experience of emotions for anxiety have been ignored (Miu et al., 2009; Heilman & Miclea, 2009). As such, in order to obtain more effective preventative interventions and treatments, the most basic aspect of anxiety personalities should be addressed first. Yet, the existing studies have mainly focused their attention on the pathological characteristics and symptoms of anxiety disorders itself rather than on the trait anxious personality that are experienced by the individual. Hence, this research aimed to focus on the trait anxiety, the preliminary level of trait anxious personality among anxious children in Kuala Lumpur.

Existing research has already highlighted some of the risk factors for anxiety. There is a need to identify and testify some of the common risk factors to target the most vulnerable groups and administer immediate preventative interventions. Vulnerable demographics include women, a family history of major depressive disorder, disturbed family environment, childhood sexual abuse, low self-esteem, and lower educational attainment, which can all increase the risk of anxiety (Blanco et al. 2015). Besides, sex as a risk factor for anxiety symptoms has been proven by many previous studies in adult population (Iverach, Jonesb, McLellana, Lynehama, Menziesc, Onslowc, & Rapee, 2016; Dudeney, Sharpe, Jaffe, Jones, & Hunt, 2017; Marques, Bevilaqua, Fonseca, Nardi, Thuret & Dias, 2016; Guzelhan, Conkbayir, Ugurlucan, Yildiz, Alpagut and Bozbuga, 2018; Blau, Dimino, Demaria, Beverly & Chessler, 2016). In Malaysia, However, data regarding childhood anxiety is limited. It concluded that parental anxiety and sex have a strong impact on trait anxiety among children. However, there is controversy in research findings regarding the contribution of the related risk factors to trait anxiety. Despite many studies on the relationship between parental anxiety and sex with trait anxiety, very limited research has been conducted in this area among children in Malaysia. To address this gap, this research study the relationship between parents' trait anxiety and sex difference in trait anxiety among anxious children.

In addition, biological brain location and brain electrical activity has been attributed to causing anxiety in children too (ref). Evidence-based assessment for anxiety is well-researched, yet clinically, it is still insufficient to develop earlier recognition and improve differential diagnosis, treatments, and preventions (Smoller, 2017). As such, adopting integrative and alternative methods like combining self-report instruments with neuroimaging method to identify and treat anxiety symptoms can be an emerging trend in mental health field. Existing research has shown that people with feelings of anxiety have some brain region activation specifically at the temporal lobe and prefrontal cortex when there were fear responses occur (Demerdzieva & Pop-Jordanova, 2011; Ribas et al., 2018; Smith, Zambrano-Vazquez & Allen, 2016). However, the respective brain location that is associated with a specific type of anxiety, that is trait anxiety is still unclear in Malaysia context.

Studying children as a target group is crucial to prevent the early onset of anxiety disorders. While previous research on the topic has shown that there were some biological relationships between parents' trait anxiety and sex with anxiety in children, the commonalities of the risk factors remain unidentified in the academia and the relevant research on the topic of child anxiety in Kuala Lumpur is still ambiguous. Besides, most of the past studies only focus on children who had been diagnosed with anxiety disorder in clinical setting, less focus is drawn to children with only anxiety symptoms. The need to identify the risk factors is crucial as it will provide baseline information to form suitable interventions in a local context. Using neuroimaging to identify the brain location for the specific trait anxiety is also important. With the problems mentioned, the present study aims to study the relationship between brain location, parents' trait anxiety and sex with trait anxiety among anxious children in Kuala Lumpur area.

1.4 Research Question

As a response to the aforementioned problem statements, there are five research questions guiding this study:

Question 1: What are the socio-demographic characteristics (age, sex, number of siblings, type of school, household monthly income) for anxious children?

Question 2: What is the relationship between parents' trait anxiety and children's trait anxiety among anxious children?

Question 3: What is the relationship between the brain location of the prefrontal cortex and temporal lobe with trait anxiety among anxious children?

Question 4: What is the difference in sex for trait anxiety among anxious children?

Question 5: What is the unique predictor for trait anxiety among anxious children?

1.5 Objective of Study

The general objective and specific objectives of this study are stated in this section.

1.5.1 General Objective

The general objective of this research is to study the relationship between brain location, parents' trait anxiety and sex differences in trait anxiety among anxious children in Kuala Lumpur.

1.5.2 Specific Objectives

Based on the general objective, five specific objectives of this study are proposed as follow:

1. To describe the demographic factors (age, sex, number of siblings, type of school, household monthly income), brain location, and parents' trait anxiety among anxious children.
2. To identify the relationship between parents' trait anxiety and children's trait anxiety among anxious children.
3. To examine the relationship between brain location at prefrontal cortex and temporal lobe with trait anxiety among anxious children.
4. To identify the sex difference in trait anxiety among anxious children.
5. To ascertain the unique predictor of trait anxiety among anxious children.

1.6 Hypotheses of Study

In line with the proposed specific objectives (objective 2, 3, 4, and 5), four alternative hypotheses are proposed in this present study as past literatures and theoretical framework showed that there were significant relationships between the study variables. A summary table of research questions, research objectives and hypotheses are shown in Table 1.1. The alternative hypotheses are constructed as follow:

Objective 2: To identify the relationship between parents' trait anxiety and children's trait anxiety among anxious children.

Ha1: There is a significant relationship between parents' trait anxiety and children's trait anxiety among anxious children.

Objective 3: To examine the relationship between brain location at prefrontal cortex and temporal lobe with trait anxiety among anxious children.

Ha2: There is a significant relationship between Fp1 and trait anxiety among anxious children.

Ha3: There is a significant relationship between Fp2 and trait anxiety among anxious children.

Ha4: There is a significant relationship between F3 and trait anxiety among anxious children.

Ha5: There is a significant relationship between F4 and trait anxiety among anxious children.

Ha6: There is a significant relationship between F7 and trait anxiety among anxious children.

Ha7: There is a significant relationship between F8 and trait anxiety among anxious children.

Ha8: There is a significant relationship between T3 and trait anxiety among anxious children.
Ha9: There is a significant relationship between T4 and trait anxiety among anxious children.

Objective 4: To identify the sex difference in trait anxiety among anxious children.
Ha10: There is a significant difference in sex for trait anxiety among anxious children.

Objective 5: To ascertain the unique predictor of trait anxiety among anxious children.
Ha11: There is a unique predictor of brain location for trait anxiety among anxious children.

Table 1.1: Summary table of research questions, research objectives, hypotheses and data analysis

Research Questions (RQ)	Research Objectives (RO)	Hypotheses	Data Analysis
RQ1: What are the socio-demographic characteristics (age, sex, number of siblings, type of school, household monthly income) for anxious children?	**RO1:** To describe the demographic factors (age, sex, number of siblings, type of school, household monthly income), brain location, and parents' trait anxiety among anxious children.		Descriptive Statistics
RQ2: What is the relationship between parents' trait anxiety and children's trait anxiety among anxious children?	**RO2:** To identify the relationship between parents' trait anxiety and children's trait anxiety among anxious children.	Ha1: There is a significant relationship between parents' trait anxiety and children's trait anxiety among anxious children.	Pearson's Correlation Coefficient
RQ3: What is the relationship between the brain location of the prefrontal cortex and temporal lobe with trait anxiety among anxious children?	**RO3:** To examine the relationship between brain location at prefrontal cortex and temporal lobe with trait anxiety among anxious children.	Ha2: There is a significant relationship between Fp1 and trait anxiety among anxious children. Ha3: There is a significant relationship between Fp2 and trait anxiety among anxious children. Ha4: There is a significant relationship between F3 and trait anxiety among anxious children. Ha5: There is a significant relationship between F4 and trait anxiety among anxious children. Ha6: There is a significant relationship between F7 and trait anxiety among anxious children.	Pearson's Correlation Coefficient

1.7 Significance of Study

This research intends to study the relationship between brain location, parents' trait anxiety and sex differences in trait anxiety among anxious children. By studying this, it can provide some significant output and outcome to the related field in at least three aspects of literature, practical and policy implication.

First, in term of literature, the findings from this research would be able to explain the relationships between brain location, parents' trait anxiety and sex difference with trait anxiety and provide insight among anxious Chinese children in Kuala Lumpur. It can enrich the current pool of data for anxious children under trait anxiety in the Malaysian context, which is the anxious personality that is innate when children are born. By focusing on trait anxiety rather than on the pathological characteristics of anxiety disorder in detail, researchers can have a better understanding of anxiety symptoms that experienced by children first began from childhood at a preliminary stage.

Furthermore, by identifying the parents' trait anxiety and sex as the factors that contributed to trait anxiety, it is beneficial for practitioner to implement more targeted treatment plan that can address this preliminary level of anxious personality. For instance, gender-specific intervention as well as parental intervention can be taken into consideration for practitioner to implement a holistic treatment plan since young, parents will also be in a better position to take precautionary measures to help prevent their children from being vulnerable to anxiety disorders.

On top of that, by identifying the associated brain location, it can act as an accurate and clinical reference for the Neurofeedback practitioner. By using qEEG brain mapping technique, it can help in early detection by assessing the specific locations. Besides, practitioners can targe3t the specific point for trait anxiety after identifying the exact location based on the International 10-20 system. Neurofeedback is devoted to training the human brain in order to regain the ability of control over electro-physiological processes in the human brain, optimizing, modifying and normalizing brain electrical activities using the principal of operant conditioning. It helps to normalize the brain function to reduce anxiety symptoms. For children, Neurofeedback is a suitable treatment method and can be easily administered as it is adopted while watching movies and playing games. It can increase the commitment of children compared to other treatment methods.

Last but not least, at policy level, this study could serve as a reference for government bodies, non-government bodies as well as policy maker. The related authorities are beneficial from the findings from this research as it can aid in planning of programs to implement early intervention for anxious children. Since childhood is the high-risk phase for anxiety (Katja, Susanne & Daniel, 2009), administering preventative interventions at this stage is the most important and

effective way to prevent the onset of future anxiety disorders. The findings also can be implemented to improve school and family setting to target anxious children to reduce their trait anxious personality. Additionally, the programs can be more specific and individualized to target different specific group of children with similar symptoms and address anxiety at the basic level rather than just treating the symptoms.

1.8 Definition of Terminology

There is a total of three key terms in this research, which include trait anxiety, brain location, and parents' trait anxiety and sex. For each of the terms, the conceptual definition and operational definition are provided.

1.8.1 Trait Anxiety

Conceptual definition

According to the Oxford Dictionary of Psychology (Colman, 2015), trait anxiety is similar to state anxiety in response to an encountered threat. However, it is disparate in the intensity and duration of the anxiety experienced, as well as in the range of situations that cause the anxiety to occur (Miu, Heilman, & Miclea, 2009). Trait anxiety is different from state anxiety in that trait anxiety is a prolonged anxious feeling that will last for a long period of time and will not cease even after the removal of the threat. Trait anxiety can also be conceptually defined as the tendency to experience state anxiety when individuals respond to the perceived threat (Elwood, Wolitzky-Taylor, & Olatunji, 2012).

Operational definition

Trait anxiety can be operationally defined as the score obtained by the participant in STAI-T. The trait anxiety score can range from 20 to 60 (ref). The higher SATI-Tscore, indicates the higher level the participant experiences trait anxiety. A cut off point of 36 was used to categorize the participants into two different groups: those who score 36 or lower will be categorized into the low trait anxiety group; those who score 37 and above will be categorized into high trait anxiety group (Edwards, Burt & Lipp, 2010a, 2010b; McLeod & Rutherford, 1992; Miller & Patrick, 2000).

1.8.2 Brain Location

Conceptual definition

According to American Electroencephalographic Society Guidelines for Standard Electrode Position Nomenclature (1991), brain location is conceptually

defined as the location of scalp electrodes based on 10-20 System of Electrode Placement. The 10-20 system is based on the relationship between the location of an electrode and the underlying area of cerebral cortex which responsible for the detection of brain electrical activities underneath the specific cortical area.

Operational definition

Brain locations can be operationally defined as the on-task brain map for brainwaves with 23-38 Hz at the temporal lobe area (T3, T4) and prefrontal cortex area (Fp1, Fp2, F3, F4, F7, F8) obtained through QEEG brain mapping by doing 15 tasks as shown in Figure 1.1 and Figure 1.2. It can be measured, detected, and recorded by passing through macroelectrodes, microelectrodes, or semi-microelectrodes and lastly passing through an amplifier (Bullock, 2004). First, participants will be wearing a cap that suits their head size. After that, conductive gel will be injected into the electrodes on the scalp in order to improve the accuracy of the brainwaves recoding and reduce artifacts.

Participants performed a total of 15 tasks with 60 seconds for each task. The tasks included eyes close, eyes open, movie watching task, digit-span task, imagination task, reading task, and pattern recognition tasks. For all the periods of recording, participants were requested to sit still without any body movements and relax their jaws and facial muscles. For the eyes opening tasks, they were required to hold their eyes and stop blinking during the recoding period. Tasks were recorded according to the placement of electrodes based on the International 10-20 system.

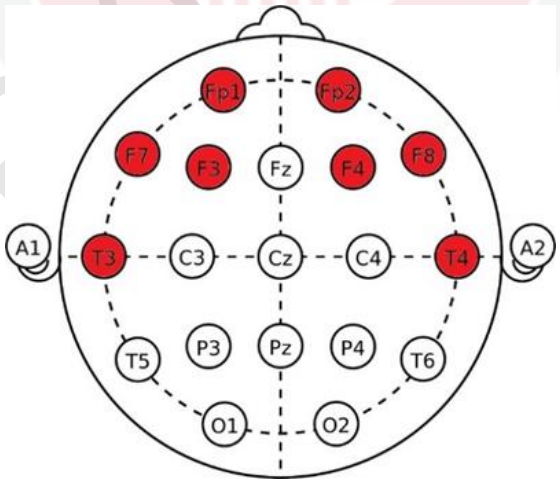

Figure 1.1: International 10-20 System

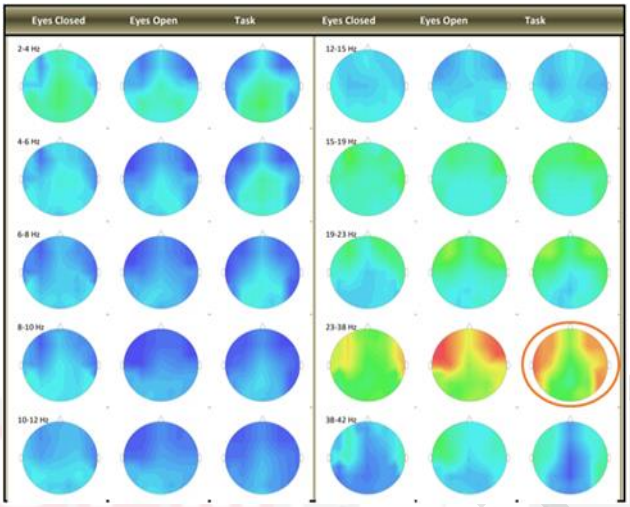

Figure 1.2: qEEG brain mapping report

1.7.1 Parents' trait anxiety

Conceptual definition

Parents' trait anxiety is conceptually defined as the general or characteristic level of anxiety that experienced by parents (Embong, Ting, Ramli, & Harunarashid, 2018). Trait anxiety are the anxious personality which are innate born within an individual that is relatively long term and will not cease with the removal of threat (Colman, 2015).

Operational definition

Parents' trait score can be operationally defined as the average score of the mother and the father obtained from STAI-T. A higher score suggests a higher level of trait anxiety and vice versa for parents.

1.7.2 Sex

Conceptual definition

Sex is conceptually defined as the structural and functional characteristics of a person or organism that allow assignment as either male or female; sex is determined by chromosomes, hormones, and external and internal genitalia/ gonads (Colman, 2015).

Operational definition

Sex is operationally defined based on the responses revealed in the sex column.

1.9 Theoretical Approaches

Theoretical approaches are important in research because they assist in the explanation of a principle or idea. They serve as a reference for designing and explaining a phenomenon in a research study. According to Freud's theory of anxiety (1926), he stated that "The ego is the actual seat of anxiety" which reflected that anxiety as a signal. For instance, he made a distinction between a primary anxiety, that is the automatic anxiety and a signal anxiety. An automatic anxiety triggered by a traumatic situation in which the helpless ego is overwhelmed while signal anxiety can be activated in the ego response to situations of danger as a kind of warning that a traumatic situation is imminent, so that defensive measures can be put into place to avoid it. In fact, past trauma experiences and learned helplessness resulted in poorer defense mechanism which cause someone to be more vulnerable to psychopathological anxiety (Andri, 2011).

Subsequently, it is then supported by the biology of fear- and anxiety- related behaviors framework which explained the vulnerability to psychopathology anxiety appears to be a consequence of predisposing factors or traits, which resulted from numerous gene-environment interactions during developmental stage, specifically start from prenatal stage (Thierry Steimer, 2002). When children are stepping through the developmental stages, psychosocial factors getting more prominent in affecting their coping skills towards stress. According to Eric Erickson's stages of psychosocial development (1959), the source of conflicts for school age children and adolescent being externalized as social interaction and independence is the main concern to focus on. During these stages, children with predisposed vulnerable traits are more likely to experience intense inferiority and confusion. An appropriate adaptive response is crucial for school age children and adolescent to successfully find a balance at every developmental stage in resolving the conflicts (Eric Erickson, 1959).

During each developmental stage, children experience anxious emotions, that is the mental state or feeling that is accompanied by three interrelated fundamental aspects of mental or psychological level, the neuro or physiological level, and the behavioral level. Anxiety (mental level), a fear response that acts as a signal of danger, threat, or motivational conflict (physiological level), and to trigger appropriate adaptive responses (behavioral level) (Thierry Steimer, 2002).

On top of that, this framework revealed that increased vulnerability to anxiety and its disorders is associated with particular traits or endophenotypes, ie, traits that may be intermediate in the chain of causality from genes to disease. A genetic predisposition, essentially linked to the expression of genes that are

expressed by brain-behavior relationships (neuronal circuitry and functional neuroanatomy) and cellular/molecular (neurotransmitters, hormones, sex, biochemical factors) (Thierry Steimer, 2002). The genetic predisposition forms the first anxious trait in an individual while environmental factors can interact with the expression of the relevant genes during early development and determine the functional properties of the neural and biochemical systems involved in coping with stressful events. They can also modulate the learning processes that occur at a later stage, when the individual is confronted with various life events.

When facing a danger, the predisposed trait anxiety lowered the threshold for autonomic activation and resulted in immediate increased arousal. At this stage, external auditory, visual, olfactory, or somatosensory stimuli are relayed by the thalamus and transmitted to the amygdala and cortex. The basolateral complex (BLA) of the amygdala is the input side of the system, which also receives contextual information from the hippocampal formation (entorhinal cortex, hippocampus, and ventral subiculum). After intra-amygdala processing of the emotional stimuli, the central nucleus of the amygdala (CeA) activated the ascending noradrenergic system originating from the locus ceruleus (LC), peripheral noradrenaline systems via corticotropin-releasing factor (CRF) neurons, and the hypothalamus via paraventricular nucleus (PVN) and lateral hypothalamus (LH). As a result, the CeA directly activates various midbrain regions or nuclei responsible for different aspects of the fear/anxiety response: freezing or escape through periaqueductal gray (PAG) system, increased respiratory rate through parabrachial nucleus (PBN), startle through caudal reticulopontine nucleus of the reticular formation (RPC), and via the dorsal motor nucleus of the vagus (DMN) in the medulla, which together with the lateral hypothalamus is responsible for the increase in heart rate and blood pressure associated with emotional events. The prefrontal cortex processes cognitive information and modulates the physiological, neuroendocrine, and behavioral responses via the amygdala.

1.10 Conceptual Framework

The conceptual framework showed in Figure 1.3 reveals the relationship between brain location, parents' trait anxiety, and sex on trait anxiety among children.

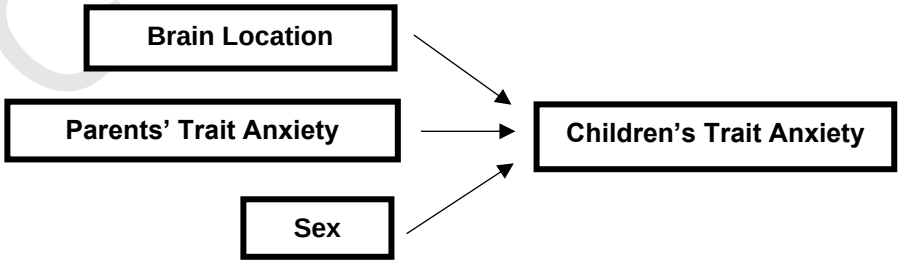

Figure 1.3: Conceptual framework

1.11 Conclusion

The first section of this chapter summarized the background of the study and focused on the increased rate of anxiety around the world. It highlighted the problem of childhood anxiety disorders in developing countries like Malaysia. It proposed that there is a relationship between brain location, parents' trait anxiety, and sex when analyzing trait anxiety among children. Subsequently, problem statement was proposed followed by the objective and hypothesis of study. Next, significance of study was discussed in term of literature, practical and policy aspect. In addition, the term "trait anxiety", "brain location", "parents' trait anxiety" and "sex" were defined operationally and conceptually. A theoretical framework of "Biology of fear- and anxiety-related behaviors framework" were revealed followed by the conceptual framework that included the relationship between dependents variable and independent variable.

REFERENCES

Abend, R., de Voogd, L., Salemink, E., Wiers, R. W., Pérez-Edgar, K., Fitzgerald, A., ... & Bar-Haim, Y. (2018). Association between attention bias to threat and anxiety symptoms in children and adolescents. *Depression and Anxiety*, *35*(3), 229-238.

Ahmadi, A., Mustaffa, M. S., Haghdoost, A. A., & Mansor, S. M. S. (2017). Eclectic approach to anxiety disorders among rural children. *Trends in Psychiatry and Psychotherapy*, *39*(2), 88–97. doi:10.1590/2237-6089-2016-0047

Aktar, E., Majdandžić, M., De Vente, W., & Bögels, S. M. (2018). Parental expressions of anxiety and child temperament in toddlerhood jointly predict preschoolers' avoidance of novelty. *Journal of Clinical Child & Adolescent Psychology*, *47*(sup1), S421-S434.

Al-Ezzi, A., Kamel, N., Faye, I., & Gunaseli, E. (2020). Review of EEG, ERP, and Brain Connectivity Estimators as Predictive Biomarkers of Social Anxiety Disorder. Frontiers in Psychology, 11. doi:10.3389/fpsyg.2020.00730 Ali, Z., & Bhaskar, S. B. (2016). Basic statistical tools in research and data analysis. *Indian Journal of Anaesthesia*, *60*(9), 662–669.

Al-Ezzi, A., Selman, N. K., Faye, I., & Gunaseli, E. (2020). Electrocortical brain oscillations and social anxiety disorder: a pilot study of frontal alpha asymmetry and delta-beta correlation. *Journal of Physics: Conference Series*, 1529, 052037. doi:10.1088/1742-6596/1529/5/052037

Alvarez-Vargas, D., Abad, C., & Pruden, S. M. (2020). Spatial anxiety mediates the sex difference in adult mental rotation test performance. *Cognitive research: principles and implications*, *5*(1), 1-17.

American Electroencephalographic Society Guidelines for Standard Electrode Position Nomenclature (1991). *Journal of Clinical Neurophysiology*. *8* (2): 200–202. doi:10.1097/00004691-199104000-00007

American Psychiatric Association (2013). *Diagnostic and Statistical Manual of Mental Disorders.* Arlingon, VA: American Psychiatric Publishing.

American Psychiatric Association. (2017). *What is obsessive-compulsive disorder.* https://www.psychiatry.org/patients-families/ocd/what-is-obsessive-compulsive-disorder

American Psychiatric Association, *DSM-5 The diagnostic and statistical manual of mental disorders. 5 ed*, ed. D. Kupfer: American Psychiatric Association.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* 95th ed.). Arlington, VA: American Psychiatric Publishing.

American Psychological Association. (2017). *Anxiety.* Retrieved October 27, 2017, from http://www.apa.org/topics/anxiety/

Andri, A. (2011). Anxiety theory based on classic psychoanalitic and types of defense mechanism to anxiety. *Journal of the Indonesian Medical Association*, *57*(7).

Ang, C. (2020). Anxiety in Malaysian children and adolescents: validation of the screen for child anxiety related emotional disorders (SCARED). *Trends Psychiatry Psychotherapy, 42*(1): 7-15. https://doi.org/10.1590/2237-6089-2018-0109

Atangana, A., & Gómez-Aguilar, J. F. (2017). *A new derivative with normal distribution kernel: Theory, methods and applications. Physica A: Statistical Mechanics and Its Applications, 476, 1–14.* doi:10.1016/j.physa.2017.02.016

Antoniadis, E. A., & McDonald, R. J. (2001). Amygdala, hippocampus, and unconditioned fear. *Exp Brain Res*, *138*(2), 200-209.

Ary, D., Jacobs, L.C. and Razavieh, A. (1996). *Introduction to Research in Education*. Harcourt Brace College Publishers, Fort Worth.

Averill, J. R. (2015). *Emotion and anxiety: Sociocultural, biological, and psychological determinants* (pp. 44-50). London: Psychology Press.

Azham, A. A., & Janon, N. S. (2021). The relationship between parental anxiety, child's behavioral inhibition and child anxiety. *Southeast Asia Early Childhood Journal, 10*(1), 50-61. doi:https://doi.org/10.37134/saecj.vol10.1.5.2021

Azouz, H. G., Khalil, M., & Abdeldayem, S. H. (2018). Quantitative electroencephalographic changes in children with autism spectrum disorders. *Alexandria Journal of Pediatrics*, *31*(3), 97-105. doi:10.4103/AJOP.AJOP_29_18

Babazade, R., Dogangun, B., Sutas-Bozkurt, P., Gungor, G., & Kayaalp, L. (2015). Association between anxiety level of child with parental and patient factors during preoperative anesthesia visit. *The Open Psychiatry Journal*, *9*(1).

Bandelow, B. & Michaelis, S. (2015). Epidemiology of anxiety disorders in the 21st century. *Dialogues Clin Neurosci, 17*(3), 327-335.

Banerjee, A., & Chaudhury, S. (2010). Statistics without tears: Populations and samples. *Industrial Psychiatry Journal*, *19*(1), 60-65.

Baranne, M.L. & Falissard, B. (2018). Global burden of mental disrders among children aged 5-14 years. *Child Adolesc Psychiatry Ment Health, 12*(19): 1-9. https://doi.org/10.1186/s13034-018-0225-4

Baron, R. A., & Branscombe, N. R. (2014). *Social Psychology* (13th ed.). London: Pearson Education Limited.

Baxter, A. J., Scott, K. M., Ferrari, A. J., Norman, R. E., Vos, T., & Whiteford, H. A. (2014). Challenging the myth of an “epidemic” of common mental disorders: Trends in the global prevalence of anxiety and depression between 1990 and 2010. *Depression and Anxiety, 31*(6), 506-516.

Becker-Haimes, E. M., Diaz, K., Haimes, B. A., & Ehrenreich-May, J. (2016). Anxiety and atopic disease: Comorbidity in a youth mental health setting. *Child Psychiatry and Human Development*, *48*(4). doi:10.1007/s10578-016-0678-8

Behrens, B., Swetlitz, C., Pine, D. S., & Pagliaccio, D. (2019). The screen for child anxiety-related emotional disorders (SCARED): Informant discrepancy, measurement invariance, and test-retest reliability. *Child Psychiatry & Human Development*, *50*(3), 473-482.

Bendixen, A. B., & Engedal, K. (2016). Anxiety among older psychiatric patients: a hidden comorbidity? *Aging Ment Health*, *20*(11), 1131-1138. doi: 10.1080/13607863.2015.1063106

Bhuvaneswari, J. S., & Kumara, P. (2012). Analysis of Electroencephalography (EEG) Signals and Its Categorization–A Study. *Procedia Engineering*, *38*, 2525-2536. doi:https://doi.org/10.1016/j.proeng.2012.06.298

Bin Almi, A. A., & Khaiyom, J. H. A. (2020). An Exploratory Study on the Perceived Challenges, Coping Strategies and Facilitating Factors for Optimal Implementation of Community-based Mental Health Services in Malaysia: A Study Protocol. *Malaysian Journal of Psychiatry*, *29*(1).

Bjørngaard, J. H., Carslake, D., Lund Nilsen, T. I., Linthorst, A., Davey, S. G., Gunnell, D., et al. (2015). Association of body mass index with depression, anxiety and suicide. *An instrumental variable analysis of the hunt study*. *10* (7): e0131708. doi:10.1371/journal.pone.0131708

Blau, G., Dimino, J., Demaria, Jr., Peter, A., Beverly, C., & Chessler, M. (2016). *College Student Journal*. *50*(4), 551-556.

Blau, G., Dimino, J., Demaria Jr, P. A., Beverly III, C., & Chessler, M. (2017). Mental health concerns' impact on graduation intent and improvement for brief counseling. *Journal of Assessment and Institutional Effectiveness*, *6*(2), 142-164.

Blicher, S., Feingold, L., & Shany, M. (2017). The role of trait anxiety and preoccupation with reading disabilities of children and their mothers in predicting children's reading comprehension. *Journal of learning disabilities*, *50*(3), 309-321.

Boyd, D. G., & Bee, H. L. (2014). *Lifespan Development* (6th ed.). London: Pearson Education Limited.

Brice, C., Warner, C.M., Okazaki, S., Ma, P.W., Sanchez, A., Esseling, P, & Lynch, C. (2015). Social anxiety and mental health service use among Asian-American high school students. *Child Psychiatry Hum Dev.*, *46*(5): 693-701. doi: 10.1007/s10578-014-0511-1

Bullock, T. H. (2004). *Biology of brainwaves: Natural history and evolution of an informative-rich sign of activity*. California.: Kjellberg Inc.

Byrne, G. (2021). The use of acceptance and commitment therapy (ACT) in addressing family accommodation (FA) for child anxiety. *The Cognitive Behaviour Therapist*, *14*.

Caesar, A., & Walkup, J. T. (2016). Quantitative electroencephalography biomarkers of anxiety in youth. *Journal of the American Academy of Child & Adolescent Psychiatry*, *55*(10). doi: https://doi.org/10.1016/j.jaac.2016.09.090

Cagliostro, D. (2020). *Panic attacks & panic disorder: symptoms, causes, and treatment.* https://www.psycom.net/panic-attacks-panic-disorder-symptoms

Çalbayram, N. Ç., Altundag, S., & Aydin, B. (2016). The anxiety states of fathers of hospitalized children and its causes. *Health Science Journal*, *10*(6), 1.

Callaway, A. (2018). *Birth order as a predictor of anxiety* [Unpublished master's thesis]. Brescia University College, Canada.

Canelón, S. P., & Boland, M. R. (2020). A Systematic Literature Review of Factors Affecting the Timing of Menarche: The Potential for Climate Change to Impact Women's Health. *International Journal of Environmental Research and Public Health*, *17*(5), 1703. doi:10.3390/ijerph17051703

Cantón-Cortés, D., Cortés, M. R., & Cantón, J. (2019). Pathways from childhood sexual abuse to trait anxiety. *Child abuse & neglect*, *97*, 104148.

Caporino, N. E., Sakolsky, D., Brodman, D. M., McGuire, J. F., Piacentini, J., Peris, T. S., ... & Birmaher, B. (2017). Establishing clinical cutoffs for response and remission on the Screen for Child Anxiety Related Emotional Disorders (SCARED). *Journal of the American Academy of Child & Adolescent Psychiatry*, *56*(8), 696-702.

Carlucci, L., Albaghli, B., Saggino, A., & Balsamo, M. (2020). Does a fundamentalist mindset predict a state or trait anxiety? The covariate role of dogmatism. *Journal of religion and health*, 1-17.

Carlucci, L., Watkins, M. W., Sergi, M. R., Cataldi, F., Saggino, A., & Balsamo, M. (2018). Dimensions of anxiety, age, and gender: Assessing dimensionality and measurement invariance of the State-Trait for Cognitive and Somatic Anxiety (STICSA) in an Italian sample. *Frontiers in psychology*, *9*, 2345.

Centers for Diseases Control and Prevention. (2020). Children's mental health: anxiety and depression. https://www.cdc.gov/childrensmentalhealth/depression.html

Central Intelligence Agency. (2020). Malaysia. *In The world factbook*. Retrieved from https://www.cia.gov/the-world-factbook/countries/malaysia/

Chabot, R. J., Coben, R., Hirshberg, L., & Cantor, D. S. (2015). QEEG and VARETA based neurophysiological indices of brain dysfunction in attention deficit and autistic spectrum Disorder. *Austin Journal of Autism & Related Disabilities*, *1*(2).

Cacha, L. A., Poznanski, R. R., Salleh, S. H., Latif, A. A., & Ariff, T. M. (2020). Anxiety-related circuitry in affective neuroscience. *Journal of Molecular and Clinical Medicine, 3*(3), 67-74. doi:10.31083/j.jmcm.2020.03.806

Chapman, J., Halldorsson, B., & Creswell, C. (2020). *Mental Imagery in Social Anxiety in Children and Young People: A Systematic Review. Clinical Child and Family Psychology Review.* doi:10.1007/s10567-020-00316-2

Cheah, Y.K., Azahadi, M., Phang, S.N., & Manaf, N.H.A. (2019). Sociodemographic, lifestyle, and health factors associated with depression and generalized anxiety disorder among Malaysian adults. *Journal of Primary Care & Community Health, 11*: 1-8. https://doi.org/10.1177/2150132720921738

Cheong, C. C., Ashari, A., Ibrahim, R., Sulaiman, W. A. W., & Yong, K. K. (2020). *Brain Electrical Activity Mapping (BEAM) on Trait Anxiety among Malaysian Chinese Children* (No. gjbssr576). Global Academy of Training and Research (GATR) Enterprise.

Cheong, C. C., Ashari, A., Ibrahim, R., Sulaiman, W. A. W., & Yong, K. K. (2019). A preliminary study of biological attributed risk factor for anxiety among anxious children. *International Journal of Education*, *4*(33), 209-222.

Chiarenza, G. A. (2016). The quantified EEG characteristics of responders and non-responders to long-term treatment with atomoxetine in children with attention deficit hyperactivity disorders. *International Journal of Psychophysiology*, *104*, 44-52. doi:https://doi.org/10.1016/j.ijpsycho.2016.04.004

Choi, Y., Lee, M., Lee, J. P., Park, M., Lee, S. Y., & Hahm, H. C. (2020). Disempowering parenting and mental health among Asian American youth: Immigration and ethnicity. *Journal of applied developmental psychology*, *66*, 101077.

Christine, M. Y. (2019). A theoretical framework for understanding social anxiety in the context of career development. *Canadian Journal of Career Development*, *18*(1), 20-31.

Chua, B. S., Hamid, H. A., Mutang, J. A., & Ismail, R. (2018). Psychometric properties of the State-Trait Anxiety Inventory (Form Y) among Malaysian university students. *Psychology of Sustainability and Sustainable Development*, *10*(9), 3311. doi:https://doi.org/10.3390/su10093311

Clauss, J. A., Benningfield, M. M., Rao, U., & Blackford, J. U. (2016). Altered prefrontal cortex function marks heightened anxiety risk in children. *Journal of the American Academy of Child & Adolescent Psychiatry*, *55*(9), 809-816.

Cohen, J. (1988). Statistical power analysis for the behavioral sciences. *Journal of the American Statistical Association*, *334*. doi:10.1016/B978-0-12-179060-8.50012-8

Cohen, Jacob. (1988). *Statistical power analysis for the behavioral sciences*.

Cohen, J. R., Andrews, A. R., Davis, M. M., & Rudolph, K. D. (2018). Anxiety and depression during childhood and adolescence: Testing theoretical models of continuity and discontinuity. *Journal of abnormal child psychology*, *46*(6), 1295-1308.

Colman, A. M. (2015). *Oxford dictionary of psychology* (forth ed., p. 306).

Creswell, J., W. (2013). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches. Canadian Journal of University Continuing Education, 35(2).* doi:10.21225/d54s3d

Curran, P. J., West, S. G., & Finch, J. F. (1996). The robustness of test statistics to nonnormality and specification error in confirmatory factor analysis. *Psychological Methods, 1*(1), 16–29. https://doi.org/10.1037/1082-989X.1.1.16

DeJesus, R. S., Breitkopf, C. R., Ebbert, J. O., Finney Rutten, L. J., Jacobson, R. M., Fan, C., & Sauve, J. S. (2016). Associations between anxiety disorder diagnoses and body mass index differ by age, sex and race: a population based study. *Clin Pract Epidemiol Ment Health*, *12*, 67-74. doi:10.2174/1745017901612010067

DeJesus, R., Moretti, F., McAllister, G., Wang, Z., Bergman, P., Liu, S., ... & Nyfeler, B. (2016). Functional CRISPR screening identifies the ufmylation pathway as a regulator of SQSTM1/p62. *Elife*, *5*, e17290.

Department of Health & Human Services. (2014). *What are the five major tyeos of anxiety disorders?* https://www.hhs.gov/answers/mental-health-and-substance-abuse/what-are-the-five-major-types-of-anxiety-disorders/index.html

Department of Statistics Malaysia. (2019, July). *Current Population Estimates, Malaysia, 2018-2019.* https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=155&bul_id=aWJZRkJ4UEdKcUZpT2tVT090Snpydz09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09#:~:text=Malaysia's%20population%20in%202019%20is,1.1%20per%20cent%20in%202018.

Dias, F. V., Campos, J. Á. D. B., Oliveira, R. V., Mendes, R., Leal, I., & Maroco, J. (2016). Causal factors of anxiety symptoms in children. *Clinical and Experimental Psychology*, *2*(2), 1-11.

Dindo, L. N., Recober, A., Haddad, R., & Calarge, C. A. (2017). Comorbidity of migraine, major depressive disorder, and generalized anxiety disorder in adolescents and young adults. *Int J Behav Med*, *24*(4), 528-534. doi:10.1007/s12529-016-9620-5.

Dreno, B., Bagatin, E., Blume-Peytavi, U., Rocha, M., & Gollnick, H. (2018). Female type of adult acne: Physiological and psychological considerations and management. JDDG: Journal Der Deutschen Dermatologischen Gesellschaft. doi:10.1111/ddg.13664

Dudeney, J., Sharpe, L., Jaffe, A., Jones, E. B., & Hunt, C. (2017). A prevalence rate for anxiety disorders that is more than. *Pediatric Pulmonology*, 1-9. doi:10.1002/ppul.23689

Edwards, M. S., Burt, J. S., & Lipp, O. V. (2010a). Selective attention for masked and Unmasked emotionally toned stimuli: Effects of trait anxiety, state anxiety and test order. *British Journal of Psychology*, 101(2), 325-343. doi:10.1348/000712609X466559

Edwards, M. S., Burt, J. S., & Lipp, O. V. (2010b). Selective attention for masked and unmasked threatening words in anxiety: Effects of trait anxiety, state anxiety and awareness. *Behaviour research and therapy, 48*(3), 210-218. doi:10.1016/j.brat.2009.11.003

Embong, H., Ting, C. Y., Ramli, M. S., & Harunarashid, H. (2018). *Heightened anxiety state among parents of sick children attending emergency department using State-Trait Anxiety Inventory. Hong Kong Journal of Emergency Medicine, 102490791880738.* doi:10.1177/1024907918807384

Emerson, L. M., Ogielda, C., & Rowse, G. (2019). The role of experiential avoidance and parental control in the association between parent and child anxiety. *Frontiers in psychology*, *10*, 262.

Erikson, E. H. (1950). *Childhood and society*. New York: Norton.

Erskine, H. E., Baxter, A. J., Patton, G., Moffitt, T. E., Patel, V., Whiteford, H. A., & Scott, J. G. (2016). *The global coverage of prevalence data for mental disorders in children and adolescents. Epidemiology and Psychiatric Sciences, 26(04), 395–402.* doi:10.1017/s2045796015001158

Essau, C. A., Lewinsohn, P. M., Lim, J. X., Ho, M. R., & Rohde, P. (2018). Ncidence, recurrence and comorbidity of anxiety disorders in four major developmental stages. *Journal of Affective Disorders*, *228*, 248-253. doi:https://doi.org/10.1016/j.jad.2017.12.014

Etikan, I., Alkassim, R. & Abubakar, S. (2016). Comparision of Snowball Sampling and Sequential Sampling Technique. *Biom Biostat Int Journal. 3*(1). doi: 10.15406/bbij.2016.03.00055

Farris, S. G., Paulus, D. J., Gonzalez, A., Mahaffey, B. L., Bromet, E. J., Luft, B. J., & Kotov, R. (2016). Posttraumatic stress symptoms and body mass index among world trade center disaster-exposed smokers: A preliminary examination of the role of anxiety sensitivity. *Psychiatry Research*, *241*, 135-140. doi:https://doi.org/10.1016/j.psychres.2016.04.074

Faul, F., Erdfelder, E., Buchner, A., & Lang, A. (2009). Statistical power analyses using G*Power 3.1: Tests for correlation and regression analyses. *Behavior Research Methods, 41*(4), 1149-1160. doi:10.3758/brm.41.4.1149

Faul, F., Erdfelder, E., Lang, A., & Buchner, A. (2007). *G*power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. behavior research methods*. *39*(2), 175-191. doi:10.3758/bf03193146

Fauzan, N. (2015). Neurotechnology for Special Needs Children. *European Journal of Social Sciences*, *2*(4), 319-324.

Field, A. (2018). *Discovering statistics using IBM SPSS Statistics* (5th ed.). London: Sage Publications.

Fleming, S. (2019). *This is the world's biggest mental health problem—and you might not have heard of it.* World Economic Forum. https://www.weforum.org/agenda/2019/01/this-is-the-worlds-biggest-mental- health-problem/

Flujas-Contreras, J. M., García-Palacios, A., & Gómez, I. (2020). Spanish validation of the parental acceptance questionnaire (6-PAQ). *International Journal of Clinical and Health Psychology*, *20*(2), 163-172.

Folloni, D., Sallet, J., Khrapitchev, A. A., Sibson, N. R., Verhagen, L., Mars, R. B. (2019). Two fiber pathways connecting amygdala and prefrontal cortex in humans and monkeys. *eLife, 8,* e47175. doi: 10.1101/561811

Forster, S., Nunez Elizalde, A. O., Castle, E., & Bishop, S. J. (2015). Unraveling the anxious mind: anxiety, worry, and frontal engagement in sustained attention versus off-task processing. *Cerebral Cortex*, *25*(3), 609-618.

Fox, N. A., Buzzell, G. A., Morales, S., Valadez, E. A., Wilson, M., & Henderson, H. A. (2020). *Understanding the Emergence of Social Anxiety in Children with Behavioral Inhibition. Biological Psychiatry.* doi:10.1016/j.biopsych.2020.10.004

Freud, S. (1926). Inhibitions, symptoms and anxiety. In J. Strachey, & A. Freud (Eds.), *The standard edition of the complete psychological works of Sigmund Freu*d (pp. 77-175). London: The Hogarth Press.

Galvez-Sánchez, C. M., Montoro, C. I., Duschek, S., & Reyes del Paso, G. A. (2020). *Depression and trait-anxiety mediate the influence of clinical pain on health-related quality of life in fibromyalgia. Journal of Affective Disorders, 265, 486–495.* doi:10.1016/j.jad.2020.01.129

Ganella, D. E., Barendse, M. E., Kim, J. H., & Whittle, S. (2017). Prefrontal-amygdala connectivity and state anxiety during fear extinction recall in adolescents. *Frontiers in human neuroscience*, *11*, 587.

Garrett, B. (2015). *Brain and behaviour: An introduction to biological psychology* (4thth ed., pp. 73-77). London: SAGE Publication.

Garson, G. D. (2012). Data independence. In *Testing statistical assumptions* (pp. 46–47). United States of America: Statistical Associates Publishing. Retrieved from http://www.statisticalassociates.com/assumptions.pdf

Geng, H., Wang, Y., Gu, R., Luo, Y. J., Xu, P., Huang, Y., & Li, X. (2018). Altered brain activation and connectivity during anticipation of uncertain threat in trait anxiety. *Human brain mapping*, *39*(10), 3898-3914.

Getahun, A. B., Endalew, N. S., Mersha, A. T., & Admass, B. A. (2020). Magnitude and Factors Associated with Preoperative Anxiety Among Pediatric Patients: Cross-Sectional Study. *Pediatric Health, Medicine and Therapeutics*, *11*, 485.

Getahun, A. B., Endalew, N. S., Mersha, A. T., & Admass, B. A. (2020). Magnitude and Factors Associated with Preoperative Anxiety Among Pediatric Patients: Cross-Sectional Study. *Pediatric Health, Medicine and Therapeutics*, *11*, 485.

Gindis, B. (1999). Vygotsky's vision: Reshaping the practice of special education for the 21st century. *Remedial and Special Education, 20*, 333-340.

Gnilka, P. B., Ashby, J. S., & Noble, C. M. (2012). Multidimensional perfectionism and anxiety: Differences among individuals with perfectionism and tests of a coping-mediation model. *Journal of Counseling and Development, 90*(4), 427-436.

Goodwin, G.M. (2015). The overlap between anxiety, depression, and obsessive-compulsive disorder. *Dialogues Clinc Neurosci, 17*(3): 249-260.

Green, H. (2011). Sainsbury Centre for Mental Health: Childhood mental health and life chances in post-war britain. Insights from three national birth cohort studies.www.centreformentalhealth.org.uk/pdfs/life_chances_summary.pdf

Greening, S. G., & Mitchell, D. G. V. (2015). *A network of amygdala connections predict individual differences in trait anxiety. Human Brain Mapping, 36(12), 4819–4830.* doi:10.1002/hbm.22952

Gregory, A. M., Eley, T. C. (2007). Genetic influences on anxiety in children: what we've learned and where we're heading. *Clinical Child and Family Psychology*, *10*, 199–212.

Guzelhan, Y., Conkbayir, C., Ugurlucan, M., Yildiz, C. E., Alpagut, U., & Bozbuga, N. (2018, May). Gender Differences in Patients with Anxiety after Coronary Artery Bypass Surgery. In *The heart surgery forum* (Vol. 21, No. 3, pp. E165-E169).

Hackett, N. (2018). QEEG phenotypes, depression and TMS. *Progress in Neurology and Psychiatry*, *22*(3), 23-26. doi:https://doi.org/10.1002/pnp.510

Hala, S. (1997). *The development of social cognition: Studies in developmental psychology*. UK, East Sussex: Psychology Press.

Hammond, G., Agnafors, S., Bladh, M., & Josefsson, A. (2018). Anxiety in women – a Swedish national three-generational cohort study. *BMC Psychiatry, 18*, 168.

Hantsoo, L., & Epperson, C. N. (2017). Anxiety disorders among women: A female lifespan approach. *Focus (Am Psychiatr Publ)*, *15*(2), 162-172. doi:10.1176/appi.focus.20160042

Hanusz, Z., Tarasinska, J., & Zielinski, W. (2016). Shapiro-Wilk test with known mean. *Statistical Journal*, *14*(1), 89-100.

Hashim, E., Wan Hasyila, W. O., Ang, Y. H., Azlan Helmy, A. S., & Husyairi, H. (2018). Psychometric properties of the Malay translated Spielberger State-Trait anxiety inventory in exploring parental anxiety. *Medicine and Health*, *13*(1).

Haslam, N., & Kvaale, E. P. (2015). Biogenetic explanations of mental disorder: The mixed-blessings model. *Current Directions in Psychological Science*, *24*, 399– 404. doi:10.1177/0963721415588082

Hatfield, G. (2015). Objectifying the phenomenal in experimental psychology: Titchener and beyond. *Philosophia Scientiæ. Travaux d'histoire et de philosophie des sciences*, (19-3), 73-94.

Hester, C., Osborne, G. E., & Nguyen, T. (2016). The effects of birth order and number of sibling and parental cohabitants on academic achievement. Individual Psychology: Journal of Adlerian Theory, Research & Practice, 48(3), 330–348.

Hicks, B. M., Krueger, R. F., Iacono, W. G., McGue, M., Patrick, C. J. (2004). Family transmission and heritability of externalizing disorders. *Archives of General Psychiatry. 61*, 922–928.

Hill, C., Waite, P., & Creswell, C. (2016). *Anxiety disorders in children and adolescents. Paediatrics and Child Health, 26(12), 548–553.* doi:10.1016/j.paed.2016.08.007

Hugo G. (2019) Patterns and trends of urbanization and urban growth in asia. In: Jayanthakumaran K., Verma R., Wan G., Wilson E. (eds) *Internal Migration, Urbanization and Poverty in Asia: Dynamics and Interrelationships*. Springer, Singapore. https://doi.org/10.1007/978-981-13-1537-4_2

Ibrahim, N., Amit, N., & Suen, M. W. Y. (2014). Psychological Factors as Predictors of Suicidal Ideation among Adolescents in Malaysia. PLoS ONE, 9(10), e110670. doi:10.1371/journal.pone.0110670

Issawi, S., & Dauphin, B. (2017). Industry versus Inferiority. In V. Zeigler-Hill & T. K. Shackelford (Ed.), *Encyclopedia of Personality and Individual Differences*, US: Springer.

Iverach, L., Jonesb, M., McLellana, L. F., Lynehama, H. J., Menziesc, R. G., Onslowc, M., & Rapee, R. M. (2016). Prevalence of anxiety disorders among children who stutter. *Journal of Fluency Disorders*. doi:http://dx.doi.org/doi:10.1016/j.jfludis.2016.07.002 J.

Jacksona, C. E., & Snyder, P. J. (2008). Electroencephalography and event-related potentials as biomarkers of mild cognitive impairment and mild Alzheimer's disease. *The Journal of the Alzheimer's Association*, *4*(1), 137-143. doi:https://doi.org/10.1016/j.jalz.2007.10.008

Johnson, B. (2017). Paediatric anxiety disorders. *BMH Medical Journal*, *4*(3), 91-95. Retrieved from file:///C:/Users/Asus/Downloads/144-1-680-2-10-20170705.pdf

Jalnapurkar, I., Allen, M., & Pigott, T. (2018). Sex differences in anxiety disorders: A review. HSOA Journal of Psychiatry, Depression & Anxiety, *4*(12). doi:10.24966/PDA-0150/100012

Kar, S. K., Oyetunji, T. P., Prakash, A. J., Ogunmola, O. A., Tripathy, S., Lawal, M. M., … Arafat, S. (2020). Mental health research in the lower-middle-income countries of Africa and Asia during the COVID-19 pandemic: A scoping review. *Neurology, Psychiatry, and Brain Research,* 38, 54–64. https://doi.org/10.1016/j.npbr.2020.10.003

Kalia, V., Knauft, K., & Hayatbini, N. (2020). Cognitive flexibility and perceived threat from COVID-19 mediate the relationship between childhood maltreatment and state anxiety. *PloS one*, *15*(12), e0243881.

Kenedy, S. (2004). The Effect of Neurofeedback on Performance Anxiety in Dancers. *Journal of Dance Medicine & Science*, *8*(3), 78-81.

Kerns, C. M., Kendall, P. C., Zickgraf, H., Franklin, M. E., Miller, J., & Herrington, J. (2015). Not to be overshadowed or overlooked: Functional impairments associated with comorbid anxiety disorders in youth with ASD. *Behavior therapy*, *46*(1), 29-39.

Khaiyom, J.H.A., Mukhtar, F., & Po, O.T. (2019). Treatments for anxiety disorders in Malaysia. *Malays J Med Sci, 26*(3): 24-36. doi: 10.21315/mjms2019.26.3.2

Kobayashi, D., Turner, D. R., Forbes, T. J., & Aggarwal, S. (2018). Parental anxiety among children undergoing cardiac catheterisation. *Cardiology in the Young*, *28*(2), 315-321.

Krabbendam, L. & van Os, J. (2005). Schizophrenia and urbanicity: a major environmental influence–conditional on genetic risk. Schizophrenia. 31, 795–799.

Kupfer, D. J. (2015). Anxiety and DSM-5. *Dialogues Clinical Neuroscience*, *17*(3), 245-246.

Kvaale, E. P., Gottdiener, W. H., & Haslam, N. (2013). Biogenetic explanations and stigma: A meta-analytic review of associations among laypeople. *Social Science & Medicine*, *96*, 95– 103. doi:10.1016/j.socscimed.2013.07.017

Lawrence, P.J., Murayama, K., & Creswell, C. (2018). Anxiety and depressive disorders in offspring of parents with anxiety disorders: A meta-analysis. *Journal of the American Academy of Child & Adolescent Psychiatry, 58*, 46–60.

Leal, P. C., Goes, T. C., da Silva, L. C., & Teixeira-Silva, F. (2017). Trait vs. state anxiety in different threatening situations. *Trends Psychiatry Psychother*, *39*(3), 147-157. doi:10.1590/2237-6089-2016-0044

Legerstee, J. S., Dierckx, B., Utens, E. M., Verhulst, F. C., Zieldorff, C., Dieleman, G. C., & de Lijster, J. (2019). The age of onset of anxiety disorders: Etiopathogenetic and treatment implications. *Age of Onset of Mental Disorders*, 125-147. doi:10.1007/978-3-319-72619-9_7

Li, S. H., & Graham, B. M. (2017). Why are women so vulnerable to anxiety, trauma-related and stress-related disorders? The potential role of sex hormones. The Lancet Psychiatry, 4(1), 73–82. doi:10.1016/s2215-0366(16)30358-3

Libr, J. (1988). Statistical power analysis for the behavioral sciences. *Journal of the American Statistical Association*, *334*. doi:10.1016/B978-0-12-179060-8.50012-8

Lichtin, R. D., Merz, E. C., He, X., Desai, P. M., Simon, K. R., Melvin, S. A., ... & Noble, K. G. (2021). Material hardship, prefrontal cortex–amygdala structure, and internalizing symptoms in children. *Developmental Psychobiology*, *63*(2), 364-377.

Lijster, J. M., Dierckx, B., Utens, E. M., Verhulst, F. C., Zieldorff, C., Dieleman, G. C., & Legerstee, J. S. (2017). The Age of Onset of Anxiety Disorders. *Can J Psychiatry*, *62*(4), 237-246. doi:10.1177/0706743716640757

Lin, Xiuyun; Li, Longfeng; Chi, Peilian; Wang, Zhonghui; Heath, Melissa Allen; Du, Hongfei; Fang, Xiaoyi (2015). Child maltreatment and interpersonal relationship among Chinese children with oppositional defiant disorder. Child Abuse & Neglect, (), S0145213415003713–. doi:10.1016/j.chiabu.2015.10.013

Lindsley, D. B. (1952). Psychological phenomena and the electroencephalogram. *Psychology and Pediatrics*, 444-454. Retrieved from http://www.kylemathewson.com/wp-content/uploads/2010/03/Lindsley-1952-ElectroClinNeuro-ExcitabillityCycles.pdf

Lo, S. L. (2018). A meta-analytic review of the event-related potentials (ERN and N2) in childhood and adolescence: Providing a developmental perspective on the conflict monitoring theory. *Developmental Review*, *48*, 82-112.

Løvaas, M. E. S., Sund, A. M., Patras, J., Martinsen, K., Hjemdal, O., Neumer, S. P., ... & Reinfjell, T. (2018). Emotion regulation and its relation to symptoms of anxiety and depression in children aged 8–12 years: does parental gender play a differentiating role? *BMC psychology*, *6*(1), 1-11.

Luthar, S. S., Barkin, S. H., & Crossman, E. J. (2013). "I can, therefore I must": fragility in the upper-middle classes. *Development and psychopathology, 25*(4), 1529-1549. https://doi.org/10.1017/S0954579413000758

MacLeod, C., & Rutherford, E. M. (1992). Anxiety and the selective processing of emotional information: moderating roles of awareness, state and trait variables, and personal relevance of stimulus materials. *Behaviour Research and Therapy, 30*(5), 479-491. http://dx.doi.org/10.1016/0005-7967(92)90032-C

MacLeod, C., Grafton, B., & Notebaert, L. (2019). *Anxiety-Linked Attentional Bias: Is It Reliable? Annual Review of Clinical Psychology, 15(1).* doi:10.1146/annurev-clinpsy-050718-095505

Mahidin, M., U. (2020). *Chief Statistician Malaysia Department of Statistics, Malaysia.* Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=165&bul_id=T3Q0SENtcWxWdTFJa05QcHJiN0t1UT09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09

Majtyka, K. (2015). *Relationship between Trait Anxiety, State Anxiety and Awareness in Processing of Threat.*

Malaysian Mental Healthcare Performance Technical Report. (2017). *Malaysian Healthcare Performance Unit National Institute of Health Psychiatrist Group*, Ministry of Health, Malaysia.

Malcolm, C. (2015). *Current issues and emerging trends in medical tourism.* United States of America: Medical Information Science Reference.

Manan, A. I., Amit, N., Said, Z., & Ahmad, M. (2018). The influences of parenting stress, children behavioral problems and children quality of life on depression symptoms among parents of children with autism: preliminary findings. *Jurnal Sains Kesihatan Malaysia Isu Khas*, 137-143. doi:http://dx.doi.org./10.17576/JSKM-2018-19

Marques, A. A., Bevilaqua, M. C., da Fonseca, M. A., Nardi, A. E., Thure, S., & Dias, G. P. (2016). Gender differences in the neurobiology of anxiety: focus on adult hippocampal neurogenesis. *Neural Plast*, *23*(2), 284-296. doi:10.1155/2016/5026713

Martino, G., Catalano, A., Bellone, F., Russo, G. T., Vicario, C. M., Lasco, A., … Morabito, N. (2019). *As Time Goes by: Anxiety Negatively Affects the Perceived Quality of Life in Patients With Type 2 Diabetes of Long Duration. Frontiers in Psychology, 10.* doi:10.3389/fpsyg.2019.01779

Masron, T., Yaakob, U., Ayob, N. M., & Mokhtar, A. S. (2012). Malaysian Journal of Malaysia and Space. *Population and spatial distribution of urbanisation in Peninsular Malaysia 1957 - 2000*, *8*(2).

McClure, M. M., & Parmenter, M. (2020). Childhood trauma, trait anxiety, and anxious attachment as predictors of intimate partner violence in college students. *Journal of interpersonal violence*, *35*(23-24), 6067-6082.

McEvoy, P, M., Grove, R., & Slade, T. (2011). Epidemiology of anxiety disorders in the Australian general population: findings of the 2007 Australian National Survey of Mental Health and Wellbeing. Australian and New Zealand Journal of Psychiatry, 45, 957-967. doi: 10.3109/00048674.2011.624083

McReynolds**,** P., Rosen**,** James C. R. & Chelune, G. J. (1990). *Advances in psychological assessment*. New York, NY: Plenum Press.

Micco, J.A., Henin, A., Mick, E., Kim, S., Hopkins, C.A., Biederman, J., ... & Hirshfeld-Becker, D.R. (2009). Anxiety and depressive disorders in offspring at high risk for anxiety: A meta-analysis. *Journal of Anxiety Disorders, 23*, 1158– 1164.

Miller, M. W., & Patrick, C. J. (2000). Trait differences in affective and Attentional responding to threat revealed by emotional Stroop interference and startle reflex modulation. *Behavior Therapy, 31*, 757-776. doi:10.1016/S0005-7894(00)80043-X

Minho, K., Byung, H. K., & Sungho, J. (2015). Quantitative Evaluation of a Low-Cost Noninvasive Hybrid Interface Based on EEG and Eye Movement. *Ieee Transactions On Neural Systems And Rehabilitation Engineering*, *23*(2), 159-168. doi: 10.1109/TNSRE.2014.2365834

Mohammadi, M. R., Salehi, M., Khaleghi, A., Hooshyari, Z., Mostafavi, S. A., Ahmadi, N., … Amanat, M. (2019). *Social Anxiety Disorder among Children and Adolescents: A Nationwide Survey of Prevalence, Socio-demographic Characteristics, Risk Factors and Co-morbidities. Journal of Affective Disorders.* doi:10.1016/j.jad.2019.12.015

Moreira, J. M., Bouissou Morais Soares, C. M., Teixeira, A. L., Simões e Silva, A. C., & Kummer, A. M. (2015). Anxiety, depression, resilience and quality of life in children and adolescents with pre-dialysis chronic kidney disease. *Pediatric Nephrology, 30(12), 2153–2162.* doi:10.1007/s00467-015-3159-6

Morgenroth, E., Orlov, N., Lythgoe, D. J., Stone, J. M., Barker, H., Munro, J., ... & Allen, P. (2019). Altered relationship between prefrontal glutamate and activation during cognitive control in people with high trait anxiety. *Cortex*, *117*, 53-63.

Mundy, E.A., Weber, M., Rauch, S.L, Killgore, W.D.S., Simon,N.M., Pollack, M.H., & Rosso, I.M. (2015). Adult anxiety disorders in relation to trait anxiety and perceived stress in childhood. *Psychological Reports: Mental & Physical Health. 117*(2): 473-489. DOI 10.2466/02.10.PR0.117c17z6

Nie, N. H., Bent, D. H. & Hadlai. H. C. (1970). *"SPSS: Statistical package for social sciences".*

Novikova, I. A. (2013). Trait, Trait Theory. *The Encyclopedia of Cross-Cultural Psychology*. doi:10.1002/9781118339893.wbeccp545

O'Neill, Linda P.; Murray, Lindsay E. (2016). *Anxiety and depression symptomatology in adult siblings of individuals with different developmental disability diagnoses. Research in Developmental Disabilities, 51-52(), 116–125.* doi:10.1016/j.ridd.2015.12.017

Patton, K. T., & Thibodeau, G. A. (2016). *Anatomy and physiology* (9thth ed., pp. 459-461). Missouri: Elsevier Inc.

Patton, M. Q. (2001). *Qualitative Research and Evaluation Methods* (third ed., p. 688). Thousand Oaks, CA: Sage

Paulus, F. W., Backes, A., Sander, C. S., Weber, M., & von Gontard, A. (2015). Anxiety disorders and behavioral inhibition in preschool children: a population-based study. *Child Psychiatry Hum Dev*, *46*(1), 150-157. doi:10.1007/s10578-014-0460-8

Peen, J., Schoevers, R. A., Beekman, A. T. & Dekker, J. (2010). The current status of urban rural differences in psychiatric disorders. Acta Psychiatr. 121, 84–93

Pequet, A., & Warnell, K. R. (2021). Thinking of you: Relations between mind-mindedness, theory of mind, and social anxiety traits in middle childhood and adulthood. *Social Development*, *30*(1), 95-112.

Piaget, J. (1970). *Science of education and the psychology of the child*. New York: Viking.

Piaget, J. (1977). *Epistemology and psychology of functions*. Dordrecht, Netherlands: D. Reidel Publishing Company.

Platt, R., Williams, S.R., & Ginsburg, G.S. (2016). Stressful life events and child anxiety: examining parent and child mediators. *Child Psychiatry Hum Dev, 47*(1): 23-34. doi: 10.1007/s10578-015-0540-4

Quek, K. F., Low, W. Y., Razack, A. H., Loh, C. S., & Chua, C. B. (2004). Reliability and validity of the Spielberger State-Trait Anxiety Inventory (STAI) among urological patients: a Malaysian study. *Medical Journal of Malaysia*, *59*(2), 258-267. Retrieved from https://pubmed.ncbi.nlm.nih.gov/15559178/

Rahman, F. A., Othman,, M. F., & Shaharuddin, N. A. (2015). Analysis Methods of QEEG Signals: A Review in EEG Application for Brain Disorder. *Jurnal Teknologi*, *72*(2), 67-72.

Rameli, N., Ramli, F., Salleh, D., Okinono, O., & Jalaluddin, R. A. (2019). Housing programmes and urbanization : a comprehensive literature. *Journal of Techno Social*, *11*(2), 17-23.

Rappaport, B. I., Pagliaccio, D., Pine, D. S., Klein, D. N., & Jarcho, J. M. (2017). Discriminant validity, diagnostic utility, and parent-child agreement on the Screen for Child Anxiety Related Emotional Disorders (SCARED) in treatment-and non-treatment-seeking youth. *Journal of Anxiety Disorders*, *51*, 22-31.

Reigada, L. C., Hoogendoorn, C., Walsh, L., Lai, J., Szigethy, E., Cohen, B., ... Benkov, K. (2014). anxiety symptoms and disease severity in children and adolescents with crohn disease. *Journal of Pediatric Gastroenterology and Nutrition*, *60*(1). doi:10.1097/MPG.0000000000000552 ·

Report of Household Income And Basic Amenities Survey, 2016, Budget 2020, Ministry of Finance Malaysia. Retrieved from https://www.therakyatpost.com/2020/01/08/b40-m40-t20-what-do-they-even-mean/. Data Table : Income Threshold for T20, M40 & B40.

Rhebergen, D., Aderka, I. M., van der Steenstraten, I., van Balkom, A. J., van Oppen, P., Stek, M. L., ... Batelaan, N. M. (2017). Admixture analysis of age-of-onset in generalized anxiety disorder. *Journal of anxiety disorders*, *50*. doi:10.1016/j.janxdis.2017.05.003

Ribas, V. G., Ribas, R. G., Nóbrega, J. A., Nóbrega, M. V., Andrade Espécie, J. A., Calafange, M. T., & Mendes Calafange, C. O. (2018). Pattern of anxiety, insecurity, fear, panic and/or phobia observed by quantitative electroencephalography (QEEG). *Dementia & Neuropsychologia*, *12*(3). doi:http://dx.doi.org/10.1590/1980-57642018dn12-030007

Rice, K. G., & Van Arsdale, A. C. (2010). Perfectionism, perceived stress, drinking to cope, and alcohol-related problems among college students. *Journal of Counseling Psychology, 57*(4), 439-450. doi:10.1037/a0020221

Sachs-Ericsson, N. J., Sheffler, J. L., Stanley, I. H., Piazza, J. R., & Preacher, K. J. (2017). *When Emotional Pain Becomes Physical: Adverse Childhood Experiences, Pain, and the Role of Mood and Anxiety Disorders. Journal of Clinical Psychology, 73(10), 1403–1428.* doi:10.1002/jclp.22444

Sahithya, B. R., & Vijaya, R. (2020). Sociodemographic Correlates of Anxiety Disorders in Children: A Cross-sectional Study in an Indian Outpatient Setting. *Journal of Indian Association for Child & Adolescent Mental Health*, *16*(3), 116-138.

Salmerón, R., García, C. B., & García, J. (2018). *Variance Inflation Factor and Condition Number in multiple linear regression. Journal of Statistical Computation and Simulation, 88(12), 2365–2384.* doi:10.1080/00949655.2018.1463376

Satpute, A. B., Mumford, J. A., Naliboff, B. D., & Poldrack, R. X. (2012). Human anterior and posterior hippocampus respond distinctly to state and trait anxiety. *Emotion*, *12*(1), 58-68. doi: 10.1037/a0026517

Saviola, F., Pappaianni, E., Monti, A., Grecucci, A., Jovicich, J., & De Pisapia, N. (2020). Trait and state anxiety are mapped differently in the human brain. *Scientific Reports*, *10*(1), 1-11.

Shahabuddin, S. (2015). Regression: Uses and abuses. Retrieved from http://www.myacme.org/ijmtp/IJMTPV15N1/IJMTPV15N1/7_P003_IJMTPV15N1.pdf

Scully, C., McLaughlin, J., & Fitzgerald, A. (2020). The relationship between adverse childhood experiences, family functioning, and mental health problems among children and adolescents: a systematic review. *Journal of family therapy*, *42*(2), 291-316.

Schraegle, W. A., & Titus, J. B. (2017). The influence of endophenotypic, disease-specific, and environmental variables on the expression of anxiety in pediatric epilepsy. *Epilepsy and Behavior*, *75*, 90-96. doi:https://doi.org/10.1016/j.yebeh.2017.07.008

Sendzik, L., Schäfer, J. Ö., Samson, A. C., Naumann, E., & Tuschen-Caffier, B. (2017). Emotional awareness in depressive and anxiety symptoms in youth: A meta-analytic review. *Journal of youth and adolescence*, *46*(4), 687-700.

Shain, L. M., Pao, M., Tipton, M. V., Bedoya, S. Z., Kang, S. J., Horowitz, L. M., & Wiener, L. (2020). Comparing Parent and Child Self-report Measures of the State-Trait Anxiety Inventory in Children and Adolescents with a Chronic Health Condition. *Journal of clinical psychology in medical settings*, *27*(1), 173-181.

Shamsuddin, K., Fadzil, F., Ismail, W. S. W., Shah, S. A., Omar, K., Muhammad, N. A., … Mahadevan, R. (2013). Correlates of depression, anxiety and stress among Malaysian university students. Asian Journal of Psychiatry, 6(4), 318–323. doi:10.1016/j.ajp.2013.01.014

Shamseer L, Moher D, Clarke M, Ghersi D, Liberati A, Petticrew M, Shekelle P, Stewart L, PRISMA-P Group. (2015). *Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation*. BMJ.

Simpson, H. B., Neria, Y., Lewis-Fernandez, R., & Schneier, F. (2010). *Anxiety disorder : Theory, research, and clinical perspectives* (pp. 223-225). Cambridge, United Kingdom: Cambridge University Press.

Smith, E. E., Zambrano-Vazquez, L., & Allen, J. B. (2016). Patterns of alpha asymmetry in those with elevated worry, trait anxiety, and obsessive-compulsive symptoms: A test of the worry and avoidance models of alpha asymmetry. *Neuropsychologia*, *85*, 118-126. doi:https://doi.org/10.1016/j.neuropsychologia.2016.03.010

Smiley, P. A., Partington, L. C., Cochran, C. R., & Borelli, J. L. (2020). Autonomy-restrictive socialization of anger: Associations with school-aged children's physiology, trait anxiety, state distress, and relationship closeness. *Developmental psychobiology*, *62*(8), 1134-1149.

Smoller, J. W. (2017). Anxiety genetics: Dispatches from the frontier. *American Journal of Medical Genetic*, *174*(2), 117-119. doi:https://doi.org/10.1002/ajmg.b.32526

Sorscher, S. (2017). Anxiety and hereditary testing results. *Journal of Genetic Counseling*, *26*, 1162-1163. doi:10.1007/s10897-017-0109-4

.

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). Manual for the state-trait anxiety inventory. Palo Alto, CA: Consulting Psychologists Press.

Spielberger, C. D., Gorsuch, R. L., Lushene, R. E., Vagg, P. R., & Jacobs, G. A. (1983*). Manual for the State-Trait Anxiety Inventory (Form Y)*. Palo Alto: Consulting Psychologists Press.

Stanczykiewicz, B., Banik, A., Knoll, N., Keller, J., Hohl, D. H., Rosińczuk, J., & Luszczynska, A. (2019). *Sedentary behaviors and anxiety among children, adolescents and adults: a systematic review and meta-analysis.* BMC Public Health, *19*(1). doi:10.1186/s12889-019-6715-3

Steimer, T. (2002). The biology of fear-and anxiety-related behaviors. *Dialogues Clin Nuerosc,* 4(3): 231-249.

Steinmayr, R., Crede, J., McElvany, N., & Wirthwein, L. (2016). *Subjective Well-Being, Test Anxiety, Academic Achievement: Testing for Reciprocal Effects. Frontiers in Psychology, 6.* doi:10.3389/fpsyg.2015.01994

Ströhle, Andreas; Gensichen, Jochen; Domschke, Katharina (2018). *Diagnostik und Therapie von Angsterkrankungen. Deutsches Aerzteblatt Online*. doi:10.3238/arztebl.2018.0611

Svensson E.D. (2011) Validity of Scales. In: Lovric M. (eds) *International Encyclopedia of Statistical Science*. Springer, Berlin, Heidelberg

Tahir, L., Musah, M. B., Panatik, S. A., Ali, M. F., & Said, M. N. H. M. (2019). Primary school leadership in Malaysia: The experience of stress among deputy heads. *Educational Management Administration & Leadership, 47*(5), 785–814. 8

Thatcher, R. (2010). Validity and reliability of quantitative electroencephalography. *Journal of Neurotherapy*, *14*(2), 122-152. doi:10.1080/10874201003773500

The National Suicide Registry Malaysia Annual Report (2010). Ministry of Health, Malaysia.

Thomas, F., Renaud, F., Benefice, E., De Meeüs, T., & Guegan, J.F. (2010). International variability of ages at menarche and menopause: Patterns and main determinants. *Human Biology.* 73, 271–290.

Tiittanen, M. (1998). *Brain Waves: ESL Intermediate and Advanced Comunication Activities*. Oxford: Oxford University Press.

Titchener, K., & Wong, J. J. (2015). A weighty issue: Explaining the association between body mass index and appearance-based social anxiety. *Eating Behavior*, *16*, 13-16. doi:https://doi.org/10.1016/j.eatbeh.2014.10.005

Towe-Goodman, N.R., Franz, L., Copeland, W., Angold, A., & Egger, H. (2015). Perceived family impact of preschool anxiety disorders. *Journal of American Academy of Child & Adolescent Psychiatry, 53*(4): 437-446. doi: 10.1016/j.jaac.2013.12.017

Turgeon, L., & Chartrand, l. (2003). Psychometric properties of the french canadian version of the state-trait anxiety inventory for children. *Educational and Psychological Measurement*, *63*(1), 174-185. doi:https://doi.org/10.1177/0013164402239324

Vallis, Emily Howes; Zwicker, Alyson; Uher, Rudolf; Pavlova, Barbara (2020). Cognitive-behavioural interventions for prevention and treatment of anxiety in young children: A systematic review and meta-analysis. *Clinical Psychology Review*, 101904–. doi:10.1016/j.cpr.2020.101904

Van Huffelen, A. C., Poortvliet, D. C., & Van Der Wulp, J. M. (1984). quantitative electroencephalography in Cerebral Ischemia. Detection of abnormalities in “Normal” EEGs. *Progress in Brain Research Volume, Pages*, *62*, 3-28. doi:https://doi.org/10.1016/S0079-6123(08)62167-6

Vieites, V., Pruden, S. M., & Reeb-Sutherland, B. C. (2020). Childhood wayfinding experience explains sex and individual differences in adult wayfinding strategy and anxiety. *Cognitive research: principles and implications*, *5*(1), 1-16.

Visscher, P. M., Hill, W. G., & Wray, N. R. (2008). Heritability in the genomics era – concepts and misconceptions. *Nat. Rev. Genet. 9* (4): 255–266. doi:10.1038/nrg2322. PMID 18319743.

Vitasari, P., Herawan, T., Wahab, N. M., & Othman, A. (2011). Validating the instrument of study anxiety sources using factor analysis. *Social and Behavioral Sciences*, *15*, 3831-3836. doi:10.1016/j.sbspro.2011.04.38

Vitasari, P., Wahab, M. N., Herawan, T., Othman, A., & Kumardurai, S. S. (2011). Re-test of State Trait Anxiety Inventory (STAI) among engineering students in Malaysia: reliability and validity tests. *Social and Behavioral Sciences Volume*, *15*, 3843-3848. doi: https://doi.org/10.1016/j.sbspro.2011.04.383

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Waechter, S., & Stolz, J. A. (2015). *Trait Anxiety, State Anxiety, and Attentional Bias to Threat: Assessing the Psychometric Properties of Response Time Measures. Cognitive Therapy and Research, 39(4), 441–458.* doi:10.1007/s10608-015-9670-z

Washington, T., Rose, T., Coard, S. I., Patton, D. U., Young, S., Giles, S., & Nolen, M. (2016). *Family-Level Factors, Depression, and Anxiety Among African American Children: A Systematic Review. Child & Youth Care Forum, 46*(1), 137–156. doi:10.1007/s10566-016-9372-z

Wang, J. T. (2012). On the Relationship between Pearson Correlation Coefficient and Kendall's Tau under Bivariate Homogeneous Shock Model. *ISRN Probability and Statistics*, 1-7. doi:10.5402/2012/717839

Warnell, K. R., Pecukonis, M., & Redcay, E. (2018). Developmental relations between amygdala volume and anxiety traits: Effects of informant, sex, and age. *Development and psychopathology*, *30*(4), 1503-15.

Weaver, I. C., Champagne, F. A., Brown, S. E., Dymov, S., Sharma, S., Meaney, M. J., & Szyf, M. (2005). Reversal of maternal programming of stress responses in adult offspring through methyl supplementation: altering epigenetic marking later in life. *Journal of Neuroscience, 25*(47), 11045–11054. doi: 10.1523/JNEUROSCI.3652-05.2005

Weger, M., & Sandi, C. (2018). *High anxiety trait: A vulnerable phenotype for stress-induced depression. Neuroscience & Biobehavioral Reviews, 87, 27–37.* doi:10.1016/j.neubiorev.2018.01.012

Weinert, F. E., & Helmke, A. (1998). The neglected role of individual differences in theoretical models of cognitive development. *Learning and Instruction*, 8, 309–324.

Wong, C. H., Sultan Shah, Z. U., Teng, C. L., Lin, T. Q., Majeed, Z. A., & Chan, C. W. (2016). A systematic review of anxiety prevalence in adults within primary care and community settings in Malaysia. *Asian Journal of Psychiatry*, *24*, 110-117. doi:10.1016/j.ajp.2016.08.020

World Health Organization. (2020). *Mental health.* https://www.who.int/mental_health/maternal-child/child_adolescent/en/

World Health Organization. (2005). *Mental health policy and service guidance package: child and adolescents mental health policies and plans*. Geneva, Switzerland: World Health Organization.

Wyse, S. (2011) *What is the difference between qualitative research and quantitative research?* [online] Available at: http://www.snapsurveys.com/blog/what-is-the-difference-between-qualitative-research-and-quantitative-research/

Yeoh, S.H., Tam, C.L., Wong, C.P. & Bonn, G. (2017). Examining depressive symptoms and their predictors in Malaysia: stress, locus of control, and occupation. *Frontiers in Psychology, 8*(14): 1-10. https://doi.org/10.3389/fpsyg.2017.01411

Zainuddin, A. A., Siti Nazirah, M. S., Kamaruzaman, S. R., Goh, K. S., Saiful Islam, A. H., Hasan, M. T., ... Anizah, A. (2018). The puberty profile of female adolescents in Cheras, Malaysia. *The Journal of Health and Translational Medicine*, *21*(2), 64-69. Retrieved from https://adum.um.edu.my/index.php/jummec/article/view/1563