



UNITED ARAB EMIRATES
MINISTRY OF HEALTH & PREVENTION

MENTAL HEALTH

Published Work on
Mental Health
in the United Arab Emirates–
1992 - 2019

Ministry of Health and Prevention
www.mohap.gov.ae



WORD FROM THE ASSISTANT UNDERSECRETARY

Ministry of Health and Prevention strives to deliver world-class mental health services to meet the needs of all members of the UAE society. Continued efforts to improve the monitoring of service quality and to raise community awareness on mental health disorders are being encouraged. Given the significant burden of mental ill-health, for societies, individuals, and economies, there lies considerable interest in ways to strengthen the systems of mental health, and measure performance in a standardised and objective way. Benchmarking activities, quality assurance programs, and independent accreditation initiatives are being fostered both nationally and locally to improve accountability. We are also in line to educate healthcare practitioners and empower patients through specialised programs.

Mainstream mental health promotion activities have acquired considerable attention at present, for example, destigmatisation campaigns are being targeted at whole communities. Such efforts are essential and needs to be expanded, consolidated and complemented by promoting mental health activities that targets specific population groups.

We call on all community members, non-government and government sectors to forge an upgraded service system to improve the lives of all UAE population affected by mental illness.

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WORD FROM THE DIRECTOR OF STATISTICS AND RESEARCH CENTRE

As a research director of the Statistics and Research Centre, I am pleased to present this research report on Mental, and behavioural disorders. The research section under Statistics and Research Centre of MOHAP has considerably taken a leading role in providing access to high quality, evidence-based information, and improving the transfer of knowledge between researchers, scientific professionals, policy makers, medical practitioners, and institutions generating an environment to foster excellence in research productivity. As it is well known that common mental and behavioural disorders cause human distress and large costs for the society. Mental health is a problem that affects patients, their families and communities. Additionally, good and improved mental health and wellbeing at an early age is essential for young individuals and children as it can assist in paving the way to an improved and better future.

Ministry of Health and Prevention, UAE observed a need to set up an information-generating document to share evidence among scientific community to enable continuation of research work. Once this knowledge base has been created, government will urge, formulate and integrate programs and policies related to promotion and prevention in mental health consistent with their specific needs. This report therefore makes a

significant contribution to furthering the knowledge regarding mental and behavioural disorders. The report encloses unique aspects to be stressed upon and endeavours to contribute to the knowledge base concerning public health aspects of mental and behavioural disorders along with offering comprehensive information for the policymakers. It can also be utilized as an awareness-raising tool. It is the result of huge effort that brings together a pool of research studies conducted in the United Arab Emirates in mental and behavioural disorders. We hope that it will facilitate and inspire amplified commitment, innovation, and cooperation in preventing mental and behavioural disorders and offer best care possible for individuals suffering from them.

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1. INTRODUCTION

The goal of this resource is to bring together published research studies conducted in the United Arab Emirates on Mental and behavioural disorders, to help build a shared understanding of the topic to better work together to support mental health. This resource will further reflect on old and current researches, influence current initiatives, and consider how the mental health promotion can be more effectively embedded in system policies, practices, and services. There is a consensus among scientific researchers that for scientific knowledge to progress it is important to undertake bibliographical research to identify the state of knowledge, possible gaps in research, and opportunities for novel contributions to the themes under study [1]. Scientific journal are the primary means of extracting scientific research publications because it presents the major results for investigation and constitutes input for new knowledge.

What is Mental Health?

Mental health incorporates feelings, actions and thoughts. People who are emotionally healthy are capable to cope up with the challenges faced in life, deal with anger, handle stressful situations, enjoy life, and maintain meaningful relationships with others [2]. A mental illness is considerably serious to cause functional impairments.

Major Non-Communicable diseases (NCDs) along with mental and behavioural disorders tend to share common features [3]. These condition most specifically strike at any age and impacts a person's life, demanding continuing management and monitoring. They tend to share common fundamental determinants, co-occur frequently and holds similar consequences. Several individuals are affected by mental and behavioural disorders, such as obsessive-compulsive disorder, attention deficit hyperactivity disorder (ADHD), depression, autism, and schizophrenia. Such an illness tends to change an individual's feelings, thoughts, and/or behaviours in different ways. With most of the diseases, mental illness is severe in few cases in addition to being mild in other types of cases. People having a mental illness don't look sick inevitably, specifically if their disease is mild. Other people possibly may display more obvious symptoms such as confusion, agitation, or withdrawal.

Mental health is a significant public health issue that even a poorest society must afford to protect, to promote, and to invest in [4]. Mental health describes how an individual feel or think about oneself and others and how one may interpret events in daily routine. It also interlinks with an individual's capability to cope with noteworthy life events, transition besides changes together with stress that often comes our way [5]. It is an emotional resilience to better enjoy life together with surviving emotional pain, sadness,

disappointment and to the level of belief in others worth, dignity in addition to one's own. Majority of the experts may contemplate mental health as a continuum [6].

The term mental health is more complex than addressing mental illness, to be precise these terms are deceptively and interchangeably used. For example, the National Service Framework for Mental Health [7] mainly stated about services for individuals with mental illness. The World Health Organization defines mental health as:

“a state of well-being in which the individual realizes his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to contribute to his or her community [8].”

In other words, “mental health means more than just an absence of mental illness; it also consists of elements of occupational in addition to social functioning.” A broad definition such as that used by the World Health Organization also expands the definition of what it is to be mentally unhealthy. “Mental health is considered to exist on a continuum from complete mental health to complete mental ill health, with individuals at countless points along that continuum.” This encourages the impression that there is not an artificial division between those who are “mentally healthy” and people who are “mentally ill.” Good mental health helps a person to cope up with issues and to enjoy life. It provides a feeling of inner strength and well-being. Exercising and eating right can also support in maintaining good mental health [9].

United Arab Emirates National Agenda

UAE aspires to develop the best system of healthcare in the world. Strategic developments at governmental level reflects a more positive understanding of mental health [10, 11]. Sufficient attention is being given to mental and behavioural disorders in the national level planning. UAE has adopted integrated approaches and strategies for these disorders recognizing their comorbidity and consequences, to move the health system towards more effective and integrated management, prevention, in addition to care. UAE classifies mental health as a vital component of a balanced care system. It is also well recognized that mental disorders cause great human sufferings, threatens social and economic development, and cut lives short. Globally, the urgency to address these global challenges are well recognized in the target 3.4 of the Sustainable Development Goals: “to reduce premature deaths from NCDs by one third by 2030 and promote mental health and well-being [10].” With this strategy, UAE is expected to outshine into

offering high standard mental health services as a part of world class healthcare services by 2021.

Aims

This report aims to facilitate an improved understanding of the evidence and approaches to gathering UAE related research studies, increasing productivity, and growth of the scientific community, accompanied by activating international alliance and cooperation. This report further discusses what mental health is, components of mental wellness, description of mental and behavioural disorders, and mental health services being offered in the UAE. Health information about major types of mental illness, such as personality disorders, psychotic disorders, anxiety disorders, affective disorders, and disorders that impact behaviour such as eating disorders, and substance use disorders are provided along with summaries of researches conducted in the United Arab Emirates. It additionally helps to provide and address foremost opportunities and way forward for the global health sector to strengthen and develop the mental health area.

- To bring together a pool of research studies conducted in the United Arab Emirates in the field of mental, and behavioural disorders.
- To set up an information-generating document to share evidence among scientific community to enable continuation of research work.
- To present the data about mental health research in UAE.

Significance

While pursuing or planning to pursue research, published research work is one of the most significant elements in any research exercise. Without published research, the work is in its essence is often considered useless. Research without fact checking is worthless. This resource will therefore, help to identify gaps in research evidence, avoid duplication in research activities hence, saving time & extra research cost, and will also guide scientific community in pursuing their research venture in future along with encouraging collaboration. Through this report, we will provide access to high quality, evidence-based researches/ information to improve the transfer of knowledge between researchers, scientific professionals, policy makers, medical practitioners, and institutions thus, generating an environment to foster excellence in research productivity.

Method

The evidence selected for this report was drawn from the UAE research bank, PubMed and some other databases. In mid-2016, the statistics and research centre developed a research bank (which can be accessed at <https://smartapps.moh.gov.ae/ords/f?p=105:521>). This report includes published papers conducted by UAE institutions on mental, and behavioural disorder. Several other comprehensive, important, and thorough evidence associated with mental,

and behavioural disorders have been recently published, which provides additional background material for this document.

The research bank uses PubMed database for extracting health related articles via a combination of keywords and Medical Subject Headings (MeSH). The database covers information about the author(s), participatory institutions, journals published those papers, full citation, web link, and the abstracts. Furthermore, cross reference list was also screened to ensure and extend a thorough literature search using Google search engine. The search strategy included the use of appropriate keywords (Medical Subject Headings (MeSH) terms) to retrieve targeted evidences. The extracted articles were then summarized and segregated under relevant categories.

Inclusion Criteria

- Published studies conducted in the United Arab Emirates on mental, and behavioural disorders using UAE research bank, PUBMED and some other databases.
- Our search was restricted to articles published in English language, peer reviewed, including disease of interest (Mental, Behavioural and Substance Use Disorders), geographical location (such as, all emirates of the United Arab Emirates) and year of publication 1992- 2019.
- Forward bibliographic searching was also carried out to identify high quality research studies.

Exclusion Criteria

- Studies conducted outside United Arab Emirates.

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2. HISTORY OF MENTAL HEALTH IN THE UAE

United Arab Emirates is a fast-developing state that primarily embraces scientific progress in every aspect surely including health. The Government of the United Arab Emirates (UAE) is also working collaboratively to efficiently improve the public health condition in the state with special focus on noncommunicable diseases, and mental health [1]. In UAE, the researches demonstrating the traditional approaches for treating and understanding mental health are quite strong [2]. There is global fear that mental and behavioural disorder are consequently increasing and might reach epidemic proportion by 2020. Ministry of health and prevention also endorsed "The National Policy for the Promotion of Mental Health in the United Arab Emirates" in 2017, and further developed its action plan which is currently in the stage of implementation. Moreover, New mental health Act is currently in the cabinet waiting for release.

Facts and Figures

According to a study conducted by Eastern Mediterranean Region, Mental Health Collaborators, Mokdad and colleagues indicated the global non-fatal burden and prevalence of mental disorders was "124,193,900 YLDs and 905,733,400 cases" respectively. On an average, 5% of global DALYs in addition to 15.7% of YLDs globally were because of the mental disorders [3]. One DALY signifies the "loss of a healthy year of life and aggregates the YLDs with the years of life lost (YLLs) due to premature mortality." According to a report published by Al-Karam [13], around 75% of the psychological conditions across the country are associated with depression and anxiety. The stigma usually leads to late diagnosis of psychiatric disorders [4]. With respect to mental health disorder burden, and based on the statistics from the WHO Mental health Atlas country profile 2014, Disability-adjusted life years (per 100,000 population) in UAE was 4,241 [5].

Neuropsychiatric disorders are assessed to contribute 19.9% of the burden of disease in UAE [4] while the suicide rate in 2011 was 3.2 age-standardized rate per 100,000 population per year [5]. According to WHO, Global Health Observatory (2015), the age-standardized suicide rates (per 100 000 population) in both sexes was 2.8 (Females: 0.9; Males: 3.6) [6].

According to a study conducted by Dervic et al, in 2012, suicide rates in Dubai from 2003 to 2009 among expatriates (6.3/100,000) was 7 times higher than the rate among the nationals (0.9/100,000) [7]. Mental health issues are more

common in females than males, and the peak age when they occur is between 45-54 years of age, however, it may differ based on the category of mental health problems a person may suffer from [8]. One of the commonest mental health problems includes depression associated with anxiety, that may impact around 4-5% of the population [9]. Based on a WHO health profile 2015 on UAE, Psychiatrists working in the mental health divisions in 2011 were 0.30 per 100 000 population [4].

A study conducted by Doran [10] aims to provide introductory estimates of the economic implications of addiction in the United Arab Emirates (UAE). The estimates for substance-related healthcare costs, criminal behaviour, and lost productivity were derived from the international and local data. The cost of productivity was the largest contributors - US\$ 4.79 billion (88%) followed by criminal behaviour at US\$ 0.65 billion (12%). Some of the major addiction costs outlined in the international guidelines associated with substance abuse include intangible costs, criminal justice/law enforcement, productivity, and consequences to the health system.

Mental Health Legislation

The federal laws in the UAE from 1981 that are specific to people with mental illnesses and disabilities [11] are as follows:

"Federal Law 28 (1981) concerning the detention and treatment of people with a mental disorder"

"Federal Law 29 (1981) concerning the rights of people with mental disability"

"Federal Law No. 14 (1995) regarding drugs and psychotropic substances"

Currently, new mental health law is in the cabinet waiting for release.

Mental Health Services and Facilities

Mental illness knows no borders [12]. In the United Arab Emirates, things are not different than the rest of the world. In fact, anxiety and depression in UAE are the top ten causes of ill health. Since, detailed mental health statistics are difficult to come by, it is therefore, not easy to accurately compare UAE region across global figures. Sufficient information is not readily presented points towards the formerly mentioned global concerns that

sufferers are unlikely to be forthcoming about being curious or acquire treatments, or even disclosing their condition to their employers, friends or family. Not all mentally ill people seek guidance and assistance. Some people deal with their concerns at home either with the family or unaccompanied, with limited time to come to the attention of health services. Some of the individual might not receive required aid as their mental health issues often goes undiagnosed. For instance, depression in old people often goes unrecognized specifically if the symptoms may be attributed to other issues enclosing chronic medical concerns.

When it comes to the treatment of mental health, significant improvements have been made by the United Arab Emirates. Only few years ago, if people required urgent or specific care, they were most likely to travel abroad to get it. With ever growing population to serve, more hospital and clinics have now been developed, along with an increased focus and developments in mental health services. At present, there are greater numbers of high-quality facilities and highly trained specialist staff, nevertheless further growth in this field is underway [5].

In the mid-1970s, mental health services were established in the United Arab Emirates. These mental health services were mainly in the form of psychiatric services in some of the emirates (including Dubai and Abu Dhabi). In 1980s, Psychological services were perceived as supportive services in treating patient who acquired psychiatric help at the hospitals [12]. The requirements for the psychological services provision in the UAE society became prominent because of swift economic as well as social changes which were undertaken within the past thirty years on top of the external influences of other cultures. Such types of changes seem to impact the role expectations, beliefs and values of people that may opposingly affect the psychological health for individuals not capable of adjusting such changes. The government is making adequate efforts to establish a competent mental health service in the United Arab Emirates. Moreover, the prevailing model for medical treatments in the United Arab Emirates and tendency of the public to seek guidance and assistance from religious healers seem to subsidize to the underutilization of mental health services in UAE that sequentially impinge on the significance of service delivery within the society. Internationally, one fact may be the trust of public in the mental health providers and services that seem to be impacted by the pragmatic increase in malpractice by those not competent professionally.

In UAE, mental health is governed by different authorities. Ministry of health and prevention is the federal entity responsible to manage the healthcare legislation in the country. The Medical Office of the Ministry of Presidential Affairs (MOPA) expanded the quantity and quality of healthcare provision in the UAE, particularly in the Northern Emirates. Other governmental bodies also tend to manage the legislation of healthcare across the country. These include Dubai Health Authority (DHA), Department of Health-Abu Dhabi, and Sharjah Health Authority. Currently,

mental health plan is involved in the general health policy [5]. In 2010, the mental health plan was reviewed that mainly focused on the wider accessibility of mental health services in the facilities of government across the region and mental health services incorporation into primary care [12].

Regarding a major step taken for recognising the growing burden of mental health disorders, the Dubai Health Authority (DHA) has incorporated the 1st inclusive mental health strategy for Dubai. The strategy is entitled as *"Happy Lives, Healthy Communities"*, was launched and harmonized with Dubai Health Strategy 2016-2021 to work towards positive operation and implementation, active participation of the community to eradicate the stigma associated with to mental illness, in addition to patient empowerment. The strategy plans to cover ten mental health development and improvement programs in Dubai by 2021.

On the other hand, Ministry of health and Prevention conducted mental health gap assessment by advocating integration of mental health into the primary and secondary health care, a community mental health Unit in Al Amal Psychiatric Hospital was launched that won the best award in the national program for happiness and positivity organized by the PMO. Specialized visiting consultants' program for mental health was also undertaken among others.

Likewise, a free mental health support network was built in Abu Dhabi, under the theme Darkness into Light UAE to raise awareness about mental health issues. Rehabilitation centres in Abu-Dhabi are also raising awareness, establishing prevention, treatment and rehabilitation services, and conducting research relating to mental health issues.

Mental health rehabilitation service across UAE helps patients to recover from difficulties of long-term problems concerning mental health. It helps and supports people who find hardships to cope with daily living activities or get on with other individuals. It aims to help mentally ill individuals to live as independently as possible, to get confidence back and deal with problems. Some mental health rehabilitations are based in hospital sites and some in the community. These services guide the patients to recover along with accepting that one may have serious difficulties requiring support and assistance. The rehabilitation teams often include psychologists, occupational therapists, nurses, psychiatrists, and social workers. Some of the mental health facilities are mentioned in the annex (see appendices).

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MEDICAL REPORT

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3. OVERVIEW OF MENTAL ILLNESS

Not every disease of brain can be classified as mental illness. Different disorders for example, multiple sclerosis, Parkinson disease, and epilepsy are disorders of brain, however, they are considered as neurological diseases rather than mental illnesses. Remarkably, the lines between mental illness and other neurological or brain disorders are somewhat blurring [1]. As scientist continues to inspect a person's brain having mental illnesses, they learn that mental illness is accompanied by modification in the structure of brain, function, and chemistry.

Causes of Mental Illness

Considering the organizational and structural brain complexity along with the complexity of the effects that mental illnesses have on behaviours, feelings and thoughts, it is barely any surprise that figuring out the causes for mental illness is a daunting task. The field of psychology, psychiatry, and neuroscience features the association between brain biology and individual behaviour, feelings and thoughts and how such actions can sometimes become abnormal. By means of this multidisciplinary research, scientist is trying to look for causes with respect to mental illness. As soon as the causes for mental illness are determined, it can be utilized to form innovative treatments and find a cure. Research studies have now attempted to clarify that combination of genetic, psychological, biological and environmental factor that may trigger the mental illness [2].

Neurosis and Psychosis

The patient knows that there is a problem and may actively seek help in neurosis. Thus, a patient tends to have an insight. Psychosis, on the other hand, typically means that the patient is somehow detached from the reality and may not accept or acknowledge that there is an issue. It is usual to assume that the patient with psychotic symptoms has no insight, although that is not always true [3]. The term is no longer used by the professional psychiatric community in the United States, having been eliminated from the Diagnostic and Statistical Manual of Mental Disorders in 1980 with the publication of DSM III.

The Biology of Mental Illness

Previous evidence affirms that mental illness is a consequence of difficulties with communication between neurons in the brain (neurotransmission). For instance, the neurotransmitter serotonin is found to be less in individuals suffering from depression. These findings led to the development of medication for this illness [2]. SSRIs or "Selective serotonin reuptake inhibitors" mainly work by reducing the serotonin levels, that in turn is reversed to presynaptic neuron. It may also lead to an increase in serotonin levels available in the synaptic space for binding

to the receptor on the postsynaptic neuron. In addition to serotonin, adjustments in other neurotransmitters might take place in depression, therefore adding to the complexity of the fundamental disease causes [2].

There might be disturbances in the neurotransmitter norepinephrine, glutamate, and dopamine in individuals having schizophrenia. One such sign that dopamine may be a vital neurotransmitter in schizophrenia comes from an opinion that illicit drug users sometime display schizophrenia like symptoms. Cocaine mainly acts on dopamine encompassing neurons in the brain to elevate the quantity of dopamine in the synapse [2].

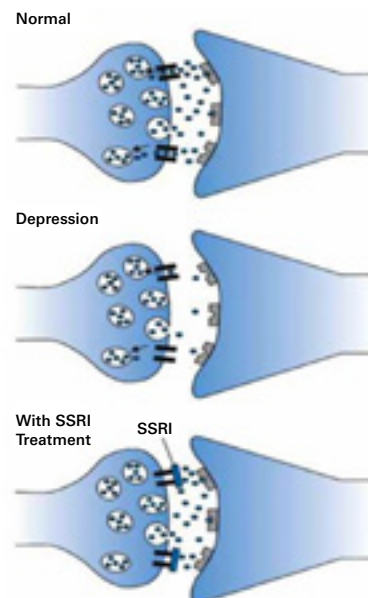


Figure 1: Association between mental illnesses and changes in neurochemicals; Adapted by study [2].

Circuit Theory

A chemical theory was developed to elucidate and enlighten the onset of mental illness. This theory follows the strategy of a purely chemical approach. The possibility of this theory is often referred to as a short circuit theory that has been foreseen after observations with respect to the chemical interaction between neuro-tropics drugs and neurochemical transmitters. Thus, a chemical interaction between norepinephrine and acetylcholine gives rise to an impartially stable complex that was found together with the chemical rearrangement of norepinephrine induced by acetylcholine in a hydrophobic medium with physical features resembling the one's of brain homogenates [4].

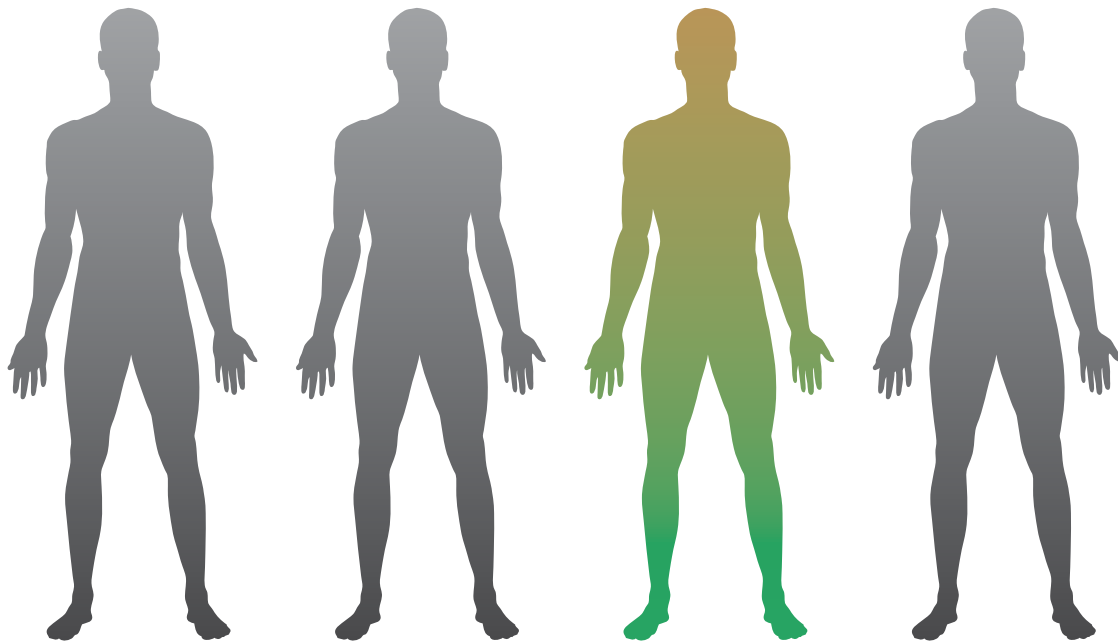


Figure 2: One in four people have a mental health issue. Adapted by Study [2]

Mental Illness Surveillance

Public health surveillance is a systematic or ongoing interpretation, analysis, collection and data dissemination used to develop public health interventions which considerably reduces the mortality, morbidity, and improves health. For a certain condition, surveillance for example, mental illness may be based on either gathering novel data or using the data gathered from the existing health information systems.

Importance of Monitoring Mental Illness

The surveillance activities that tends to monitor the mental illness are vital because mental illness is a significant public health concern. For instance, WHO revealed that mental illnesses account for more disability in developed states as compared to any illness groups such as heart disease and cancer. According to WHO estimate, nearly one in four people in the world will develop at least one mental illness (mental or neurological disorder) during their lifetime. Around 450 million individuals presently suffer from mental illness, placing mental disorders among the leading causes of disability and ill-health universally [5].

Mental illness is also related to:

1. A high incidence of chronic disease such as cancer, epilepsy, asthma, obesity, diabetes, and cardiovascular disease.

2. Reduced usage of medical care, limited adherence to treatment therapies for chronic diseases, and increased risk of adverse health outcomes.
3. Utilization of tobacco products and alcohol abuse.

Rates for both unintentional (such as car accidents) and intentional (such as suicide and homicide) injuries are 2 to 6 times higher among mentally ill individuals than in the overall population [6, 7]. Surveillance systems and population-based surveys offer much of the evidence required for effectively guiding treatment programs, mental illness prevention, and health promotion. Mental illness monitoring is an important way to provide suitable organization of the data which needs to determine the need for behavioural and mental health services and to inform the service provision. Several mental illnesses can be fruitfully managed while, increased use of and access to mental health treatment services can noticeably reduce the associated morbidity.

The Bio-Psycho-Social Model

When mental health clinicians are inquired how to figure out what is wrong with a patient, they assess that patient broadly, using something they call the “bio-psycho-social” model as a guide. The bio-psycho-social model assumes that mental health problems are hardly ever limited to just one domain of human experience (say, just a “mental” problem). Instead, most mental health problems are influenced by multiple domains of human experience,

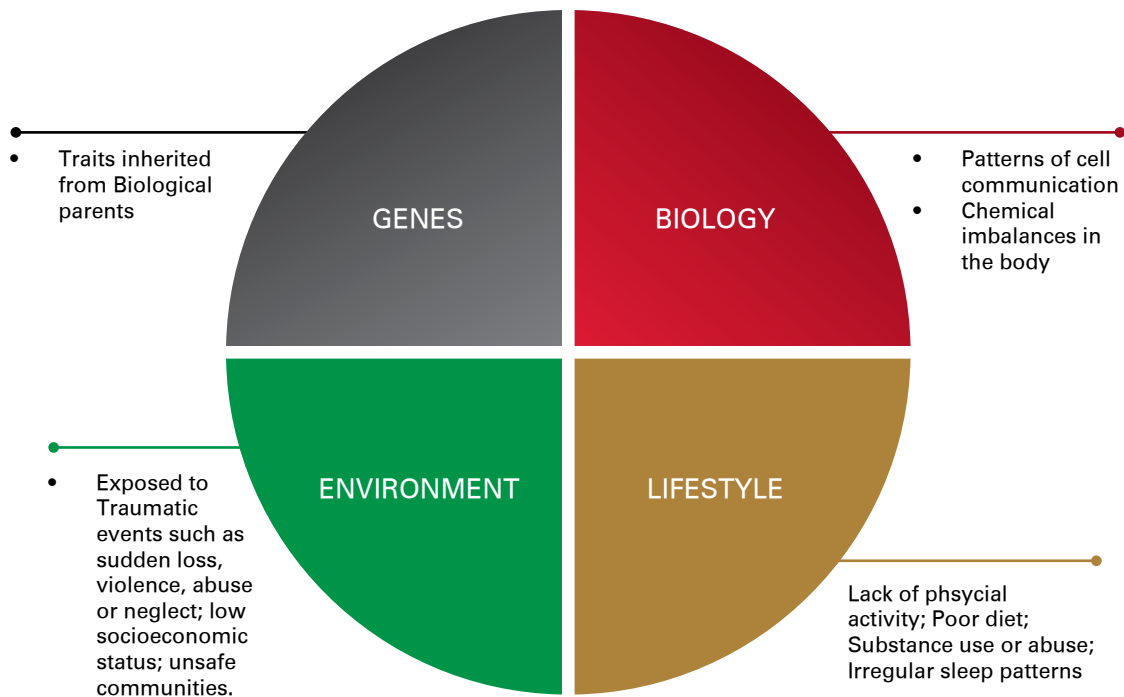


Figure 3: Risk Factors for Mental Illness

and have biological (medical), psychological (mental) and social/spiritual impacts.

Risk Factors for Mental Illness

The factors that set people at risk are social, genetic, and environmental. All these risk factors most likely combine to impact the condition of a person. Environmental aspects for example, exposure to toxins (such as tobacco smoke or lead), poor nutrition, and head injury can raise the likelihood of developing a mental condition.

Whether an individual develops a mental condition is often determined by genes. The illnesses primarily displaying genetic component comprises of schizophrenia, Attention deficit hyperactivity disorder, bipolar disorder, and autism. For instance, the children suffering from ADHD are much more likely to have a parent or sibling having Attention deficit hyperactivity disorder that additionally supports the role of genetics to determine whether a person is at risk to develop ADHD. In twin studies, ADHD is more likely observed in identical twins than fraternal twins. The same can be observed in depression and schizophrenia. Mental illness is not primarily prompted by modification or changes in single genes, scientist believes that several genes interactions may trigger mental illness. Moreover, social, environmental and genetic factors together may determine if a mental illness cases are severe or mild [1].

Social factors also demonstrates risks as well as can also harm people for example, mental health of a child. Social

factors comprise of traumatic experience such as close friend or family member death, severe parental discord, overcrowding, parent’s criminality, neglect, abuse, economic hardship, lack of social support, and violence exposure [5].

Diagnosis and Investigating Brain Function

Mental healthcare providers rely on signs and symptoms for the treatment and diagnosis of mental conditions exhibited by an individual. The goals for the experts to treat a patient is to relieve the symptoms that hinders an individual’s life so that a person can sufficiently function. Conversely, the research scientist holds different goals. Scientist wish to learn about the structural and chemical modifications that take place in the brain when an individual suffers from a mental illness. If scientist can govern what ensues in the brain, they can utilize that information to look up for a cure and develop improved treatments [2].

Different methods and techniques used by scientist to inspect the brain mainly depends on the questions being asked. For some of the inquiries, scientist used biochemical or molecular techniques to investigate more about some of the proteins and genes found in the neurons. Modifications within the brain can be visualized to learn additionally about how the structure and activity of the brain may vary. The brain only after death can be examined, however, novel procedures for imaging helps scientist to study the brain in living creatures including humans. It is essential

to comprehend such brain imaging procedures cannot be utilized for mental illness diagnosis. Yet, mental illnesses can be diagnosed by many different symptoms that a person may exhibit. The techniques of imaging addressed below would not help the professional to treat or diagnose the patients more effectively. These approaches can usually be invasive exposing patients to radiations. Studies show that these tests are primarily not performed with adolescents or children [2].

One of the widely utilized method to study the activities of brain and in what ways mental illness alters the brain includes “positron emission tomography (PET)” [8]. PET most widely measures the movement or spatial distribution of radioactive chemical injected into the tissues of living beings. Since the patient is awake, this method can be utilized to inspect the association between psychological as well as behavioural effects and modification in the activity of the brain. PET scans can sense minor (nanomolar) concentrations of tracer molecules in addition to achieving spatial resolution of about 4mm. Moreover, personal computers can rebuild images obtained from a PET scan with either three or two dimensions. PET needs the utilization of compounds that are labelled with positron emitting isotopes. Since PET scans needs only limited amount (i.e. a few mcg) of short-lived radioisotopes, this method can be used without any harm in humans [2].

Another important method includes MRI or magnetic resonance imaging. PET discloses alterations in activity levels, MRI is utilized to look at structural modifications in the brain. For instance, MRI studies demonstrates spaces or ventricles in the brain are larger in people who have schizophrenia in comparison to healthy population. Other method that scientist uses to investigate function in the living brain comprise of “electroencephalography (EEG), functional magnetic resonance imaging (fMRI), and photon emission computed tomography (SPECT)” [9]. Every method holds individual benefits and each technique delivers different information regarding the function and structure of brain. More than a single method is used by the scientist while conducting a research.

Treating Mental Illness

Most of the mental illnesses cannot be cured, but these can be monitored and treated/ recovered efficiently to lessen the symptoms and permit the individuals to function in social environments, school, and work. To start with the treatment, a person wishes to look for qualified mental health professionals [10]. Mental health professionals include psychologists, Clinical psychiatrists, psychiatrists, psychiatric nurses, mental health counsellors and social workers. Paediatricians, internists, and family doctors are usually qualified to diagnose common mental disorder including ADHD, anxiety disorders and depression. The foremost thing that mental health professionals or a doctor will do is to speak with the people to look for more symptoms, for how long symptoms may last for and how the life of a person gets affected. The health professionals may correspondingly conduct a physical examination to

observe if there are other health issues. For instance, some symptoms (for example emotional swings) can be caused due to hormonal or neurological issues linked with chronic illnesses for instance, heart disease or there can be a side effect for some of the medications. After the general health of a person is evaluated and an illness can be diagnosed, the professionals will then develop a treatment plan. This treatment may include both psychotherapy and/or medications based on the disease as well as its severity.

Psychotherapy

Psychotherapy is a treatment approach, where the mental healthcare providers (such as mental health professional, clinical psychologist and psychiatrist) and the patients often discuss feelings and problems [11]. Such a discussion may help to find a solution together with guiding patients to understand the basis of their issue. This treatment approach takes place in different forms [12]. It helps patients to

1. Alter their behaviour patterns and thoughts
2. Solve concerns in certain ways
3. Understand how prior experiences tend to influence behaviours at present
4. Learn self-management skills for the illness.

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4. MENTAL, BEHAVIOURAL AND NEURODEVELOPMENTAL DISORDERS - F01-F99

Mental, behavioural and neurodevelopmental disorders are syndromes characterized by clinically significant disturbance in an individual's cognition, emotional regulation, or behaviour that reflects a dysfunction in the psychological, biological, or developmental processes that underlie mental and behavioural functioning. These disturbances are usually associated with distress or impairment in personal, family, social, educational, occupational, or other important areas of functioning.

The ICD-10 code range for Mental, Behavioural and Neurodevelopmental disorders F01-F99 is medical classification list by the World Health Organization (WHO). ICD-10 Code range (F01-F99), Mental, Behavioural and Neurodevelopmental disorders, contains ICD-10 codes for Mental disorders due to known physiological conditions, Mental and behavioural disorders due to psychoactive substance use, Schizophrenia, schizotypal, delusional, and other non-mood psychotic disorders, Mood [affective] disorders, Anxiety, dissociative, stress-related, somatoform and other nonpsychotic mental disorders. (<https://www.icd10data.com/ICD10CM/Codes/F01-F99>)

F. MENTAL AND BEHAVIOURAL DISORDERS DUE TO PSYCHOACTIVE SUBSTANCE USE

The ICD-10 code range for ICD-10 Mental disorders due to known physiological conditions F01-F09 is medical classification list by the World Health Organization (WHO). The category includes:

F00-F09 ORGANIC, INCLUDING SYMPTOMATIC, MENTAL DISORDERS

- ✓ F00 Dementia in Alzheimer's disease
- ✓ F01 Vascular dementia
- ✓ F02 Dementia in other diseases classified elsewhere
- ✓ F03 Unspecified dementia
- ✓ F04 Amnestic disorder due to known physiological condition

- ✓ F05 Delirium due to known physiological condition
- ✓ F06 Other mental disorders due to known physiological condition
- ✓ F07 Personality and behavioural disorders due to known physiological condition
- ✓ F09 Unspecified mental disorder due to known physiological condition.

F10-F19. MENTAL AND BEHAVIOURAL DISORDERS DUE TO PSYCHOACTIVE SUBSTANCE USE

This block contains a wide variety of disorders that differ in severity or clinical form that are all attributable to the use of one or more psychoactive substances, which may or may not have been medically prescribed. The category includes:

- ✓ F10 Alcohol related disorders
- ✓ F11 Opioid related disorders
- ✓ F12 Cannabis related disorders
- ✓ F13 Sedative, hypnotic, or anxiolytic related disorders
- ✓ F14 Cocaine related disorders
- ✓ F15 Other stimulant related disorders
- ✓ F16 Hallucinogen related disorders
- ✓ F17 Nicotine dependence
- ✓ F18 Inhalant related disorders
- ✓ F19 Other psychoactive substance related disorders

F20-F29. SCHIZOPHRENIA, SCHIZOTYPAL, DELUSIONAL, AND OTHER NON-MOOD PSYCHOTIC DISORDERS

This block brings together schizophrenia, as the most important member of the group, schizotypal disorder, persistent delusional disorders, and a larger group of acute and transient psychotic disorders. Schizoaffective disorders

have been retained here in spite of their controversial nature. The category includes:

- ✓ F20 Schizophrenia
- ✓ F21 Schizotypal disorder
- ✓ F22 Delusional disorders
- ✓ F23 Brief psychotic disorder
- ✓ F24 Shared psychotic disorder
- ✓ F25 Schizoaffective disorders
- ✓ F28 Other psychotic disorder not due to a substance or known physiological condition
- ✓ F29 Unspecified psychosis not due to a substance or known physiological condition

F30-F39 MOOD [AFFECTIVE] DISORDERS

This block contains disorders in which the fundamental disturbance is a change in affect or mood to depression (with or without associated anxiety) or to elation. The mood change is usually accompanied by a change in the overall level of activity; most of the other symptoms are either secondary to, or easily understood in the context of, the change in mood and activity. Most of these disorders tend to be recurrent and the onset of individual episodes can often be related to stressful events or situations. The category includes:

- ✓ F30 Manic episode
- ✓ F31 Bipolar disorder
- ✓ F32 Major depressive disorder, single episode
- ✓ F33 Major depressive disorder, recurrent
- ✓ F34 Persistent mood [affective] disorders
- ✓ F39 Unspecified mood [affective] disorder

F40-F48 ANXIETY, DISSOCIATIVE, STRESS-RELATED, SOMATOFORM AND OTHER NONPSYCHOTIC MENTAL DISORDERS

The F40-F48 block of codes classifies anxiety, dissociate, stress-related, somatoform, and other non psychotic mental disorders. The category includes:

- ✓ F40 Phobic anxiety disorders
- ✓ F41 Other anxiety disorders
- ✓ F42 Obsessive-compulsive disorder
- ✓ F43 Reaction to severe stress, and adjustment disorders

- ✓ F44 Dissociative and conversion disorders
- ✓ F45 Somatoform disorders
- ✓ F48 Other nonpsychotic mental disorders

F50-F59 BEHAVIOURAL SYNDROMES ASSOCIATED WITH PHYSIOLOGICAL DISTURBANCES AND PHYSICAL FACTORS

The category F50-F59 classify behavioural syndromes associated with physiological disturbances and physical factors including the following categories:

- ✓ F50 Eating disorders
- ✓ F51 Sleep disorders not due to a substance or known physiological condition
- ✓ F52 Sexual dysfunction not due to a substance or known physiological condition
- ✓ F53 Puerperal psychosis
- ✓ F54 Psychological and behavioural factors associated with disorders or diseases classified elsewhere
- ✓ F55 Abuse of non-psychoactive substances
- ✓ F59 Unspecified behavioural syndromes associated with physiological disturbances and physical factors

F60-F69 DISORDERS OF ADULT PERSONALITY AND BEHAVIOUR

Disorders of adult personality and behaviour are classified to F60-F69. This block includes the following categories:

- ✓ F60 Specific personality disorders
- ✓ F63 Impulse disorders
- ✓ F64 Gender identity disorders
- ✓ F65 Paraphilias
- ✓ F66 Other sexual disorders
- ✓ F68 Other disorders of adult personality and behaviour
- ✓ F69 Unspecified disorder of adult personality and behaviour

F70-F79 INTELLECTUAL DISABILITIES

The coding for this block is based on an individual's current levels of functioning. Intellectual disabilities are defined and classified in ICD 10 CM as follows:

- ✓ F70 Mild intellectual disabilities
- ✓ F71 Moderate intellectual disabilities

- ✓ F72 Severe intellectual disabilities
- ✓ F73 Profound intellectual disabilities
- ✓ F78 Other intellectual disabilities
- ✓ F79 Unspecified intellectual disabilities

F99-F99 UNSPECIFIED MENTAL DISORDER

- ✓ F99 Mental disorder not otherwise specified

F80-F89 PERVASIVE AND SPECIFIC DEVELOPMENTAL DISORDERS

This code block is used to classify developmental disorders based on the following categories:

- ✓ F80 Specific developmental disorders of speech and language
- ✓ F81 Specific developmental disorders of scholastic skills
- ✓ F82 Specific developmental disorder of motor function
- ✓ F84 Pervasive developmental disorders
- ✓ F84.0 Autistic disorder
- ✓ F88 Other disorders of psychological development
- ✓ F89 Unspecified disorder of psychological development

F90-F98 BEHAVIOURAL AND EMOTIONAL DISORDERS WITH ONSET USUALLY OCCURRING IN CHILDHOOD AND ADOLESCENCE

Although the title for F90-F98 block codes leads the readers to believe that these codes are assigned only for disorders that occur in childhood and adolescence, coders should follow the notation that appears under the heading for this range of codes.

Notes: Codes within this category F90-F98 may be used regardless of the age of a patient. These disorders generally have onset within adolescents and childhood years; however, it may continue throughout life or not be diagnosed until adulthood.

- ✓ F90 Attention-deficit hyperactivity disorders
- ✓ F91 Conduct disorders
- ✓ F93 Emotional disorders with onset specific to childhood
- ✓ F94 Disorders of social functioning with onset specific to childhood and adolescence
- ✓ F95 Tic disorder
- ✓ F98 Other behavioural and emotional disorders with onset usually occurring in childhood and adolescence



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5. RESEARCH DATA ON COMMON MENTAL HEALTH DISORDERS IN THE UAE

This section aims to summarize the already published literature on common mental health and behavioural disorders in the United Arab Emirates during 1992 - 2019. It therefore helps to guide what research has been conducted in the UAE and/or on the UAE population. Finally, the report ends with some statistical data on the Mental Health Research in UAE, followed by a conclusion, gaps in research, and recommendations for future research. This section is intended to guide the researchers, scientific professionals, policy makers, medical practitioners, and institutions in the UAE thus, generating an environment to foster excellence in the research productivity.

MENTAL, BEHAVIORAL AND NEURODEVELOPMENTAL DISORDERS - F01-F99

Table 1: Published research papers on Dementia and Alzheimer's disease in UAE

Author	Year	UAE Institution Affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Ghubash R, El-Rufae O, Zouberdi T, Al-Shboul QM, Sabri SM. [1]	2004	UAE University, Al Ain, UAE.	Profile of mental disorders among the elderly United Arab Emirates population: sociodemographic correlates.	To study the prevalence, nature and sociodemographic correlates of mental disorders among the elderly United Arab Emirates (UAE) population.	Interview	UAE University, Al Ain	UAE nationals aged 60 years or more	The prevalence rates of mental disorders among the elderly UAE population were, more or less, within the same range reported by other comparable worldwide studies. The commonest diagnostic entities at the AGECAAT syndrome case level were depression (20.2%), anxiety (5.6%), hypochondriasis (4.4%) and organic, mostly cognitive impairment with or without dementia (3.6%).
Lorke DE, Lu G, Cho E, Yew DT. [2]	2006	UAE University, Al Ain, United Arab Emirates.	Serotonin 5-HT2A and 5-HT6 receptors in the prefrontal cortex of Alzheimer and normal aging patients.	To investigate how cellular expressions of the two serotonergic receptors 5-HT2A and 5-HT6 can be determined by immunohistochemistry in the prefrontal cortex of patients	Case control study	Al Ain, United Arab Emirates	Patients with AD (n=6) and normal age-matched controls (n = 7).	The results suggest that a decline in neurons expressing 5-HT2A, but also 5-HT6 receptors may play a role in the etiopathology of neuropsychiatric symptoms in AD.

Author	Year	UAE Institution Affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Dementia and Alzheimer's Disease								
Lorke DE, Wai MS, Liang Y, Yew DT. [3]	2010	United Arab Emirates University, Al Ain, United Arab Emirates.	TUNEL and growth factor expression in the prefrontal cortex of Alzheimer patients over 80 years old.	To elucidate factors underlying the increased risk of developing Alzheimer's disease (AD) in older individuals	Case control study	Al Ain, United Arab Emirates.	The prefrontal cortices of younger (58-79 years) and of older (over 80 years) AD patients	The distinct differences between younger and older AD patients suggest a faster progression of AD in older patients.
Ghubach et al. [4]	2010	UAE University, Al Ain, UAE.	Subjective life satisfaction and mental disorders among older adults in UAE in general population	Association of physical and psychiatric disorders on life satisfaction	Qualitative face to face interviews	UAE	610 Arab older adults; (> 60 years) (males: 347 and 263: females)	Prevalence Depression (20.2%), anxiety (5.6%), hypochondriasis (4.4%), and organic brain syndrome with or without dementia (3.6%)."
Adeghate E, Donáth T, Adem A. [5]	2013	United Arab Emirates University, Al Ain, United Arab Emirates	Alzheimer disease and diabetes mellitus: do they have anything in common?	The commonalities between Alzheimer and diabetes	Systematic review	United Arab Emirates.	-	The pathogenesis of both AD and DM has genetic as well as environmental components. Both can also cause impaired cognition and dementia. All these common denominators indicate that AD and DM share a lot of factors in terms of pathophysiology, histopathology and clinical outcome
Shebani Z, Patterson K, Nestor PJ, Diaz-de-Grenu LZ, Dawson K, Pulvermüller F. [6]	2017	United Arab Emirates University, United Arab Emirates	Semantic word category processing in semantic dementia and posterior cortical atrophy.	Investigated word processing in two groups of patients whose neurodegenerative diseases preferentially affect specific parts of the brain, to determine whether their performance would vary as a function of semantic categories proposed to recruit those brain regions.	Systematic	United Arab Emirates.	10 patients (6 male) with a clinical diagnosis of SD and 10 patients (5 male) with a clinical diagnosis of PCA	The patterns of performance on the lexical decision task demonstrate (a) general lexicosemantic processing deficits in both groups, though more prominent in SD than in PCA, and (b) differential involvement of anterior-temporal and posterior-parietal cortex in the processing of specific semantic categories of words.

Table 2: Published research papers on Delirium in UAE

Author	Year	UAE Institution Affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Delirium								
Se Joong Kim, Yeon Joo Lee, Jong Sun Park, Young-Jae Cho, Ho Il Yoon, Choon-Taek Lee, Jae Ho Lee [7]	2019	Sheikh Khalifa Specialty Hospital, Ras Al Khaimah, United Arab Emirates; Sheikh Khalifa Specialty Hospital, Ras Al Khaimah, United Arab Emirates.	Night sleep disruption related to delirium incidence in critically ill patients	To identify the sleep status for the delirium development in non-sedated critically ill patients	Prospective study	Medical ICU of a tertiary referral hospital	Total 20 patients	Longer duration of ICU stay disrupted night sleep mainly contributing to the delirium development in critically ill patients.

Table 3: Published research papers on Mental and Behavioural Disorders due to Psychoactive Substance use in UAE

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Amir T. [8]	1994	United Arab Emirates University, Al Ain.	Personality study of alcohol, heroin, and polydrug abusers in an Arabian Gulf population.	To compare the abusers of heroin, alcohol, and polydrug with non-abusers.	Experimental study	Al Ain.	3 male groups of heroin, alcohol, and polydrug abusers (n = 120); groups of 48 non-abusers were compared.	A drug-accepting-generational age group in contrast to an alcohol-accepting-generational age group was suggested.
Padmanabhan R, Ibrahim A, Bener A. [9]	2002	UAE University, Al Ain, United Arab Emirates.	Effect of maternal methionine pre-treatment on alcohol-induced exencephaly and axial skeletal dysmorphogenesis in mouse fetuses.	To find the effect of maternal methionine pre-treatment on alcohol-induced exencephaly and axial skeletal dysmorphogenesis in the fetuses of mouse.	Experimental	Al Ain, United Arab Emirates.	Fetuses of mouse were collected on gestation day 18	The data suggest that pre-administration of methionine only rescues mouse embryos of certain non-neural malformations and the lack of ameliorative effect on NTD and axial skeletal defects may be because alcohol lowers the concentration of a number of amino acids.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Jaber MA. [10]	2010	Ajman University of Science & Technology, United Arab Emirates	Oral epithelial dysplasia in non-users of tobacco and alcohol: an analysis of clinicopathologic characteristics and treatment outcome.	To analysis of clinicopathologic characteristics and treatment outcome.	Clinicopathologic experimental study	Ajman	37 patients who had neither smoked tobacco nor drank alcohol and 419 patients who both smoked tobacco and drank alcohol.	OED in non-users of alcohol or tobacco was uncommon. This accounts for 8.1% of all OED. The male to female ratio was 1:1 in the group. The most commonly affected site included tongue and buccal mucosa.
Bahi A, Dreyer JL. [11]	2012	United Arab Emirates University, Tawam Medical Campus, Al Ain, United Arab Emirates.	Involvement of nucleus accumbens dopamine D1 receptors in ethanol drinking, ethanol-induced conditioned place preference, and ethanol-induced psychomotor sensitization in mice.	Involvement of nucleus accumbens dopamine D1 receptors in ethanol drinking.	Experimental	Al Ain, United Arab Emirates.	Mice	Results suggests that down-regulation of endogenous D1R using viral-mediated siRNA in the NAc significantly decreased ethanol-induced behavioural sensitization as well as acquisition, but not expression, of ethanol-induced place preference. There were no differences in the total fluid consumed and no differences in the amount of ethanol consumed between groups prior to surgery.
Bahi A. [12]	2013	United Arab Emirates University, Al Ain, UAE	Increased anxiety, voluntary alcohol consumption and ethanol-induced place preference in mice following chronic psychosocial stress.	To study the effects of exposure from concomitant chronic stress on alcohol reward using two-bottle choice and ethanol-conditioned place preference (CPP).	Experimental	Al Ain, UAE	Chronic subordinate colony (CSC) mice "intruders" and aggressive "resident" mouse.	The data demonstrated that the long-term consequences of chronic psychosocial stress on alcohol intake in male mice, suggests chronic stress as a risk factor for developing alcohol consumption and/or anxiety disorders.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Bahi A. [13]	2013	United Arab Emirates University, Al Ain, UAE.	Viral-mediated knockdown of mGluR7 in the nucleus accumbens mediates excessive alcohol drinking and increased ethanol-elicited conditioned place preference in rats.	This study examined the mGluR7 contribution on the effect of ethanol within the nucleus accumbens (NAcc), a neural target for several types of drugs of abuse.	Experimental	Al Ain, UAE.	Male Wistar rats	Levels of mGluR7 in the NAcc regulate responsiveness to alcohol.
Smith N, Hill R2, Marshall J, Keaney F, Wanigaratne S. [14]	2014	Abu Dhabi, United Arab Emirates.	Sleep related beliefs and their association with alcohol relapse following residential alcohol detoxification treatment.	The aim of this study was to investigate the association between sleep problems and relapse in dependent drinkers in an inpatient setting.	Cross-sectional study	Abu Dhabi, United Arab Emirates.	71 individuals undergoing detoxification treatment	Longer sleep onset latency recorded on the unit predicted relapse at 4 weeks. Higher dysfunctional beliefs about sleep were found to be associated with lower relapse rates.
Hiba Alblooshi, Gary K. Hulse, Ahmed El Kashef, Hanan Al Hashmi, Mansour Shawky, Hamad Al Ghaferi, Habiba Al Safar, and Guan K. Tay [15]	2016	United Arab Emirates National Rehabilitation Center, Abu Dhabi/ Khalifa University of Science, Technology and Research, Abu Dhabi	The pattern of substance use disorder in the United Arab Emirates in 2015: results of a National Rehabilitation Centre cohort study	The patterns of SUD were described in the UAE in the first ever cohort that was recruited systematically from the country's National Rehabilitation Centre (NRC) in Abu Dhabi.	Cohort study	National Rehabilitation Centre (NRC) in Abu Dhabi.	Two hundred and fifty male patients; (18 -62 years) Controls: 239 participants (18-68 years)	Patterns Most common substance used: Opioid and alcohol Most commonly used opioid among older (≥ 30 years old): illicit opioids (Heroin). Most commonly used opioid among young people (<30 years old): Tramadol (67.2% of opioid users) Non-medical use prescribed medication included: Carisoprodol (4.2 tablets \pm 0.4 per day), Procyclidin (6.1 tablets + 0.6 per day), and Pregabalin (mean of 8.3 capsules \pm 0.5 per day)

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Pflanz-Sinclair C, Matheson C, Bond CM, Almarzouqi A, Lee AJ, Batiha A, Ghaferi HA, El Kashef A. [16]	2017	National Rehabilitation Centre, Abu Dhabi, UAE.	Physicians' experiences of SBIRT training and implementation for SUD management in primary care in the UAE: a qualitative study.	To present a qualitative study to introduce screening of substance misuse by using "Screening Brief Intervention and Referral to Treatment (SBIRT) model",	Qualitative interviews	Primary care in Abu Dhabi.	Physicians (n=17)	Screening The study identified three main themes: ● Patient follow-up ● Cultural issues ● SBIRT screening project The evaluation of qualitative process offered an important insight into implementing Screening Brief Intervention and Referral to Treatment (SBIRT) in Middle East.
Layla Alhyas, Naseeba Al Ozaibi, Hisham Elarabi, Ahmed El-Kashef, Shamil Waniyaratne, Amna Almarzouqi, Ayesha Alhosani, and Hamad Al Ghaferi [17]	2015	National Rehabilitation Centre, Abu Dhabi, UAE	Adolescents' perception of substance use and factors influencing its use: a qualitative study in Abu Dhabi	To obtain a deeper understanding of the perceptions and attitudes of adolescents in UAE with respect to substance use and to recognize the factors that may influence the substance use risk.	Qualitative study that used a focus group approach.	Abu Dhabi, United Arab Emirates.	41 adolescents; 20 Male and 21 female teenagers [aged 13-18 years]	Risk factors and perceptions/attitudes Three main themes emerged included: Substance use awareness among adolescents along with its associated harm, Gender role and image perceived factors that affects the substance use among adolescents. Factors associated with increased use of substance use among adolescents: Insufficient knowledge of the harmful drug use consequences, peer pressure, family-related factors (e.g. poor parent-adolescent's relationship and low monitoring), availability and affordability of substances, affluence, and boredom. Shield against substance use and alcohol: religiosity Other protected factors: detect early signs of addiction and CCTV implementation in schools, increasing the ability of social workers to raise awareness; carrying out schools- and communities-based educational campaigns.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Sridhar SB1, A-Thamer SS, Jabbar R. [18]	2016	RAK Medical and Health Sciences University, Ras Al-Khaimah, UAE.	Monitoring of adverse drug reactions in psychiatry outpatient department of a Secondary Care Hospital of Ras Al Khaimah, UAE	To report and monitor the nature and incidence of ADRs in OPD (Psychiatry outpatient department).	Prospective observational study	Secondary Care Hospital of Ras Al Khaimah, UAE	714 patients [18- >60 years]	<p>Incidence Incidence rates of ADR: 10.2%. Total ADRs documented: 112 Most common class of psychotropic drugs implicated in ADRs: Atypical antipsychotics 37 (33.0%). Maximum number of ADRs were due to: Escitalopram followed by quetiapine at psychiatry outpatient department of Ras Al Khaimah</p>
Jaber MA. [19]	2010	College of Dentistry, Ajman University of Science and Technology, Ajman, United Arab Emirates.	Tobacco smoking and alcohol consumption as risk factors for site-specific intraoral epithelial dysplasia.	To evaluate the role of alcohol and tobacco as a potential risk factor for epithelial dysplasia in different oral subsites.	Retrospective study	United Arab Emirates	630 patients with oral epithelial dysplasia [13–93 years]	<p>Risk factor In males: tobacco smoking and oral epithelial dysplasia of the labial mucosa and floor of the mouth were strongly associated In females: tobacco smoking and oral epithelial dysplasia of the floor of the mouth and tongue were strongly correlated Alcohol was not considered as a significant determinant of the sites of oral epithelial dysplasia in both the sexes.</p>
Jayakumary M, Jayadevan S, Ranade AV, Mathew E. [20]	2010	Gulf Medical University, Ajman, United Arab Emirates.	Prevalence and pattern of dokha use among medical and allied health students in Ajman, United Arab Emirates	Prevalence and patterns of dokha use among medical university students were evaluated.	Cross sectional survey	Medical University students; Ajman, United Arab Emirates.	104 students [17 and 27 years]	<p>Prevalence Dokha smoking prevalence among males was higher than females. 75% respondents were females. Among dokha smokers; 25% had smoked dokha daily over the past month; 11.5% reported as being lifetime smokers of dokha; 18.6% were from the College of Allied Health Sciences.</p>

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Shaikh RB, Abdul Haque NM, Abdul Hadi Khalil A, Mohsen H, Abdul Hadi Khalil Al Mohsen A, Haitham Khalaf Humadi M, Zaki Al Mubarak Z, Mathew E, Al Sharbatti S. [21]	2012	Gulf Medical University, Ajman, UAE	Acute effects of dokha smoking on the cardiovascular and respiratory systems among UAE male university students	To determine the acute effects of smoking dokha (Arabian pipe) on respiratory and cardiovascular systems among male student in University of UAE	Quasi-experimental study	United Arab Emirates (UAE)	97 male volunteers [aged more than 17 years]	Health risk Smoking dokha has a significant acute effect on respiratory rate, heart rate and systolic blood pressure.
Al-Houqani M, Ali R, Hajat C. [22]	2012	UAE University, Al Ain, United Arab Emirates	Tobacco smoking using Midwakh is an emerging health problem--evidence from a large cross-sectional survey in the United Arab Emirates	To study the modes of tobacco consumption and prevalence in UAE mainly focusing on the use of MidWakh.	Cross sectional study	United Arab Emirates (UAE)	170,430 UAE nationals aged ≥ 18 years (44% males and 56% females)	Prevalence Smoking prevalence in males was 24.3% and in females was 0.8%. Prevalence was highest in males aged 20-39. Commonest form of tobacco use: (77.4% of smokers), followed by cigar (0.66%), shisha (waterpipe) (6.8%), and Midwakh (15.0%). The mean smoking duration for cigars, shisha, Midwakh, and cigarettes were 11.0, 7.6, 9.3, and 11.4 respectively.
Bello SU, Jibril MA, Hassam HA, Haisan F, Al Zaabi J, Zangon Daura HS, Shaikh RB, al Sharbatti S, Mathew E, Sreedharan J, Muttappallyyalil J. [23]	2012	Gulf Medical University, Ajman, UAE	Smokers and marriage: attitude of youth in the United Arab Emirates	To examine the youth attitudes towards other smokers and towards marrying a smoker.	Cross-sectional study	United Arab Emirates	415 students from five universities in the United Arab Emirates (UAE).	Attitudes of youth towards smokers: Not willing to marry smokers: 83.5% Willing to marry smokers: 16.5% Both females and males are not willing to marry smokers and prefer non-smokers as spouses.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Ali AY, Safwat T, Onyemelukwe G, Otaibi MA, Amir AA, Nawas YN, Aouina H, Afif MH, Bolliger CT. [24]	2012	National Rehabilitation Centre, Abu Dhabi, United Arab Emirates.	Smoking prevention and cessation in the Africa and Middle East region: a consensus draft guideline for healthcare providers-- executive summary	To draft guidelines for smoking cessation and discuss how recommendations can be implemented or progressed to promote both primary prevention and cessation of tobacco use	Policy Analysis	Africa and the Middle East	-	Prevention This study provided an essential resource to combat the devastating effects of tobacco usage that can additionally be localized by means of engagement with local stakeholders in the region.
Bashir Aden, Sara Karrar, Omar Shafey, and Farida Al Hosni [25]	2013	Health Authority, Abu Dhabi,	Cigarette, Water-pipe, and Medwakh Smoking Prevalence Among Applicants to Abu Dhabi's Pre-Marital Screening Program, 2011	The study examined the self-reported prevalence of medwakh, water-pipe, and cigarette	Retrospective study	Health Authority – Abu Dhabi	9337 adult applicants; Premarital Screening data from April to December 2011	Prevalence Current smokers: 24.7% Smoked cigarettes: 11.5% Smoked Medwakh (hand-held pipe): 5.9% Smoked water-pipe: 4.8% Smoked a combination (more than one type): 2.5% Prevalence of water-pipe smoking: 6.8% among men and 2.8% for women Highest waterpipe smoking prevalence among Arab expatriate men: 10.2%
John L, Muttappallyyalil J. [26]	2013	Gulf Medical University, Ajman, UAE	Dokha: an emerging public health issue as a form of tobacco smoking in the middle East	The review focused on the health effects, patterns and prevalence of dokha use in Middle East.	Review	Middle East; United Arab Emirates	-	Health Risk More common users of dokha: younger people, Effective outreach health education programs; mainly targeting school students/adolescents can help to curb the emergence of this issue.
Crookes A, Wolff K. [27]	2014	Heriot Watt University, Dubai, United Arab Emirates.	Prevalence of the tobacco product dokha among high school students in Dubai	Prevalence of tobacco use among high school students resident in Dubai, UAE.	Cross sectional study	Dubai, UAE	416 students; 5 English curriculum schools; 394 subjects were analysed Age range: 15–19	Prevalence Regular tobacco use (daily or weekly) had relatively higher prevalence (23.4%) in comparison to the international data.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Bahi A, Sadek B, Nurulain SM, Łazewska D, Kieć-Kononowicz K. [28]	2015	United Arab Emirates University, Al Ain, United Arab Emirates	The novel non-imidazole histamine H3 receptor antagonist DL77 reduces voluntary alcohol intake and ethanol-induced conditioned place preference in mice.	To know if the histamine H3 receptors (H3R) have been implicated in modulating ethanol intake and preference in laboratory animals.	Experimental	Al Ain, United Arab Emirates.	Adult mice	Signaling via H3R is essential for ethanol-related consumption and conditioned reward and may represent a novel therapeutic pharmacological target to tackle ethanol abuse and alcoholism.
Obaid HA, Hassan MA, Mahdy NH, EIDisouky MI, Alzarba FEI, Alhayeemi SR1, Rillera MC, AlMazrooei BS. [29]	2015	Dubai Health Authority, Dubai, United Arab Emirates.	Tobacco use and associated factors among school students in Dubai, 2010: intervention study	To measure the current tobacco, use prevalence and its related factors.	Cross sectional study	School students in Dubai Emirate	2457 students [10-20 years]	Prevalence and Risk Factors Tobacco users: 14.6%, Water-pipes: (2.2%) Cigarettes: (11.2%) Primary reasons for smoking: smoking with peers (21.9%); stress relief (22.5%) and to experience smoking (29.4%) Health education intervention programmes were recommended.
Leena W. Asfour, Zachary D. Stanley, Michael Weitzman, and Scott E. Sherman [30]	2015	New York University Abu Dhabi, Abu Dhabi, United Arab Emirates	Uncovering risky behaviours of expatriate teenagers in the United Arab Emirates: A survey of tobacco use, nutrition and physical activity habits	To gather information on nutrition behaviours, health education gaps, and anti-tobacco media/legislation effectiveness	Case-control study	Five private high schools in the city of Abu Dhabi	Ninth grade expatriates in the UAE; 439 total responders; [12-14 years]	Risk Factor Eating disorders and dokha use is especially a concerning issue among 9 th graders expatriates.
Osman OT., Abbas AK, Eid HO, Salem MO, Abu-Zidan FM. [31]	2015	College of Medicine and Health Sciences, United Arab Emirates University, Al Ain, United Arab Emirates.	Alcohol-related road traffic injuries in Al Ain City, United Arab Emirates	To study the outcome, injury severity and demography of alcohol related road traffic collisions injuries in UAE.	Prospective study	Al Ain City	771 car occupants; Alcohol Group: 15–53 years Non-Alcohol Group: 1–78 years	Risk factor 16 participants used alcohol. There was a low incidence of self-reported alcohol-related car collisions in Al Ain city. It primarily affected older Emirati male nationals and were associated with a lower revised score of traumas because of head injury. A national registry with data on alcohol abuse is warranted in future.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Hamad A. Al Ghaferi, Ahmed Y. Ali, Tarek A. Gawad, and Shamil Wanigaratne [32]	2017	National Rehabilitation Centre, Abu Dhabi	Developing substance misuse services in United Arab Emirates: The National Rehabilitation Centre experience	To review the establishment of NRC for dealing with the emerging problem of substance misuse.	Review	Abu Dhabi	-	Risk Factors Establishment of NRC: 2002. It was mandated to establish rehabilitation services, treatment and prevention along with raising awareness by conducting researches related to substance misuse. Boredom, peer pressure, parental conflict, poor parental monitoring, lack of awareness of the harms of substance use, parents from different nationalities, and availability of funds were observed as risk factors.
Al Shemmari N, Shaikh RB, Sreedharan J. [33]	2015	Gulf Medical University, Ajman	Prevalence of dokha use among secondary school students in Ajman, United Arab Emirates.	To explore the dokha smoking prevalence among male secondary school students in Ajman UAE.	Cross sectional survey	Ajman UAE.	560 Participant; male secondary school students	High prevalence was reported among current dokha smokers, ever dokha smokers and ever smoker. Prevalence of Ever smokers: 39%; Current smokers: 24% Ever dokha smokers: 36%; Dokha smokers: 40%; Cigarettes and shisha smokers: 30%; Students smoking dokha: 30%
Laura K. Kemmis, Shamil Wanigaratne, and Kimberly A. Ehntholt [34]	2017	National Rehabilitation Centre, Abu Dhabi, United Arab Emirates	Emotional Processing in Individuals with Substance Use Disorder and Posttraumatic Stress Disorder	To investigate if the people with SUD-PTSD have more emotional processing abnormalities compared to people with PTSD alone or individuals with SUD alone.	Experimental study- between group design	Abu Dhabi, United Arab Emirates	90 individuals (aged between 18 and 70 years)	Evidence of emotional processes dysfunction in accordance with the normal population was reported. Within the SUD-PTSD group, a significant evidence was reported indicating that additional trauma impact enhanced the emotional processing dysfunction, however, limited evidence indicates that substance use amplified the dysfunction of emotional processing further. There was a significant difference between groups on the PTSD symptom severity total and on all the PDS symptom dimensions. All participants in the SUD and SUD-PTSD groups scored above clinical threshold on either or both the SDQ, AUDIT and MAP measures.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Mohammad AB, Mohammad SHK, Mohammad MK, Khan AS, Al-Hajjaj MS. [35]	2018	University of Sharjah, Sharjah, Khalifa University, Abu Dhabi, UAE.	Quantification of Trace Elements in Different Dokha and Shisha Tobacco Products using EDXRF.	To quantify different trace metals in different shisha tobacco products and dokha (medwakh) available in local markets.	Experimental study	UAE	-	The quantified trace metal concentrations in dokha and shisha tobacco using the EDXRF method were ten times higher than the LODs. The dokha and shisha tobacco products have no filters; many toxic metals can quickly enter the lungs and cause different pulmonary diseases and oral infections. Tobacco smoking causes lung and oral cancers, chronic obstructive pulmonary disease and cardiovascular diseases.
Park SH, Lee L, Shearston JA, Weitzman M. [36]	2017	New York University/ Abu Dhabi Public Health Research Center, Abu Dhabi, United Arab Emirates	Patterns of electronic cigarette use and level of psychological distress.	To examine the possible association between individuals' levels of psychological distress and use of e-cigarette using a nationally representative sample of US adults.	Survey	Adults from US	36,697 adults from the 2014 National Health Interview Survey (NHIS)	Further large-scale, longitudinal studies are needed to determine the direction of this relationship and to evaluate the long-term positive and negative consequences of such use. These are the first data to demonstrate that use of e-cigarette is associated with increased levels of psychological distress.
Fahim MA1, Nemmar A, Al-Salam S, Dhanasekaran S, Shafulullah M, Yasin J, Hassan MY. [37]	2014	UAE University, Al Ain, United Arab Emirates.	Thromboembolic injury and systemic toxicity induced by nicotine in mice.	This study examined the effects of nicotine on cerebral micro vessel thrombosis and systemic toxicity.	Experimental	Al Ain, United Arab Emirates.	Mice	The sub-acute nicotine exposure causes an increase in thrombosis in cerebral micro vessels and systemic, hepatic and pulmonary toxicity.
Fahim MA, Nemmar A, Singh S, Hassan MY. [38]	2011	United Arab Emirates University, Al Ain, UAE.	Antioxidants alleviate nicotine-induced platelet aggregation in cerebral arterioles of mice in vivo.	To illuminate the effects of nicotine on platelet aggregation in cerebral (pial) microcirculation of the mouse, and the possible protective effect of vitamins C and E.	Experimental	Al Ain, UAE	Mouse	Nicotine may increase the susceptibility to thrombosis in the cerebral arterioles in vivo and that vitamins C and E have alleviating effect on nicotine-induced thrombotic events in mice pial micro vessels.

Author	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Bastaki SM, Hasan MY, Chandranath SI, Schmassmann A, Garner A. [39]	2003	United Arab Emirates University, Al Ain, UAE	PD-136,450: a CCK2 (gastrin) receptor antagonist with antisecretory, anxiolytic and antiulcer activity.	This study investigated the effects of PD-136,450 (PD), a highly selective ligand for the CCK2 receptor, on gastric acid and pancreatic secretions	Experimental	Al Ain, UAE	Rat and rabbit.	PD inhibited gastrin-stimulated gastric acid secretion, decreased ethanol-induced damage to the gastric mucosa, stimulated pancreatic secretion (via CCK1 receptors) and displayed anxiolytic activity. Thus, PD may have utility as an adjunct therapy in peptic ulcer disease by countering the actions of gastrin and increasing acid neutralization and mucosal protection.
Syed Ilyas Shehnaz, Nelofer Khan, Jayadevan Sreedharan, Khaled Jamal Issa, and Mohamed Arifulla. [40]	2013	Syed Ilyas Shehnaz, Department of Pharmacology, Gulf Medical University, Ajman (United Arab Emirates).	Self-medication and related health complaints among expatriate high school students in the United Arab Emirates	To examines the prevalence of self-medication with both prescribed and non-prescribed (OTC) medications, related health complaints, sources of drugs, and sources of drug recommendation, and gender differences related to self-medication among expatriate high school students in the United Arab Emirates (UAE)	Cross-sectional survey	Ajman, United Arab Emirates	324 expatriate students	Health care providers, educators and parents should be actively involved in health education strategies for inculcating responsible self-medication practices in the adolescent population of UAE. This is the first study to explore self-medication practices among high school students in UAE and provides baseline data critical in creating awareness about the risks and benefits of self-medication.

Table 4: Published research papers on Schizoaffective disorders in UAE

Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Sulaiman Alkhadhari, Nasser Al Zaim, Tarek Darwish, Suhail Khan, Tarek Okasha, Hisham Ramy, and Talaat Matar Tados [42]	2015	Behavioural Science Pavilion, Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates/ Ibrahim Bin Hamad Obaidallah and Saif Bin Chubash Hospitals, Ras Alkhaimah, United Arab Emirates	Use of second-generation antipsychotics in the acute inpatient management of schizophrenia in the Middle East	To explore the discrepancies between guideline recommendations and current clinical practice in the region.	Multicentre, non-interventional study	Egypt, Kuwait, Saudi Arabia, and the United Arab Emirates	1,057 patients; Mean age of 34.4±11.44 years	Management The study suggested that in the Middle East, current clinical practice differs from guideline recommendations for mental diseases. To manage acute psychotic episodes, the patients frequently receive antipsychotics in combination therapy, by several diverse administration techniques as well as at disease either below or above the guidelines recommended for managing their acute psychotic episodes.
Ghubach R, El-Rufaie O, Zoubeidi T, Sabri S, Yousif S, Mosehly HF. [4]	2010	UAE University, Al Ain, UAE.	Subjective life satisfaction and mental disorders among older adults in UAE in general population	To determine the association of physical disorders and psychiatric disorders on life satisfaction among Arab old adults among general population.	Face-to-face interviews	UAE	610 elders (above 60 years)	Psychiatric disorders such as schizophrenia, Obsessive Compulsive disorder (OCD), and phobia were not significantly associated with life satisfaction.
Laxmi Naresh Vadlamani, Girish Banwari, Damodharan Dinakaran, Vikas Menon, and Chittraranjan Andrade [43]	2017	Department of Psychiatry, Dr. Ismail Polyclinic, Dubai, UAE.	Olanzapine has poorer efficacy than risperidone for the treatment of the negative symptoms of schizophrenia	To study the efficacy of Olanzapine and risperidone for the treatment of the negative symptoms of schizophrenia	Randomized Controlled trials	Dubai, UAE.	Patients with schizophrenia (n = 71)	A small absolute difference for both negative symptoms and global ratings are considered to be an example in point.

Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Abdel Aziz K, Elamin MH, El-Saadouni NM, El-Gabry DA, Barakat M, Alhayyas F, Moselhy HF [44]	2016	United Arab Emirates University, Al Ain, UAE; Al Ain Hospital, Al Ain, UAE; Sheikh Khalifa Medical City, Abu Dhabi, UAE.	Schizophrenia: Impact of psychopathology, faith healers and psychoeducation on adherence to medications.	To investigate whether symptom dimensions, post-discharge care plans and being involved with faith healer affect the adherence to treatment in patients with schizophrenia.	Cross-sectional	UAE.	121 patients with schizophrenia	A significant association was found between partial adherence and family involvement as well as between community team involvement full medication adherence to medications and post-discharge. Psychoeducation was a predictor for persecutory delusions, adherence to medications and lack of insight predicted partial adherence, while being involved with faith healers predicted nonadherence.
Moselhy, H., Eapen, V., Akawi, N. A., Younis, A., Salih, B., Othman, A. R., ... & Ali, B. R. [45]	2015	United Arab Emirates University, Al Ain; Al Ain Hospital, Al Ain, United Arab Emirates.	Secondary association of PDLIM5 with paranoid schizophrenia in Emirati patients.	To assess the potential schizophrenia association in Emirati patients with previously reported variants in PDLIM5, PICK1, NRG3 or DISC1 genes.	Experimental-Genotyping	Al Ain Hospital, in Al Ain city, United Arab Emirates.	121 patients with schizophrenia (SCZ) and 170 controls	Secondary association was found between PDLIM5 variants and the paranoid subtype of schizophrenia in Emirati Arabs signifying that PDLIM5 may signify a determinate/ marker for schizophrenia subtype specification. No association was found with variants in DISC1, NRG3 and PICK1 genes.

Table 5: Published research papers on Mood [affective] disorders in UAE

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Hamdan A, Hawamdeh S, Hussein A. [46]	2008	University of Sharjah, United Arab Emirates	The prevalence and correlates of depressive symptoms among Arab women in a primary health care setting.	Correlates and prevalence of depressive symptoms	Cross sectional study	Primary health care centres of Sharjah	224 Arab women (age 18 and above)	<p>Prevalence: 33% of women: Moderately (14.7%) depressed; Severely (18%) depressed.</p> <p>Risk factors: Stressful life events</p> <p>Intervention and prevention programs need to be developed in future to address the mental health needs of Arab females.</p>	
Ahmed, I, Banu H, Al-Fageer R, Al-Suwaidi R. [47]	2009	Dubai Medical College, Dubai	Cognitive emotions: depression and anxiety in medical students and staff.	Depression phenomenon and anxiety among medical doctors	Cross-sectional study	Government hospitals (3), primary health care centres (3) and the students (all years) and staff of Dubai Medical College for Girls (DMCG).	165 DMCG medical students and 93 doctors (comprising of DMCG medical staff)	<p>Prevalence: Medical students: 28.7% presented anxiety; 28.6% exhibited depression (2nd year students showing highest anxiety and depression) Medical staff: 2.2% showed anxiety; 7.8% exhibited depression</p> <p>More improved research designs are needed in future for illuminating the factors leading to anxiety & depression.</p>	

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Sulaiman et al., [48]	2010	University of Sharjah/ Al Qassimi Hospital, Sharjah, UAE	The prevalence and correlates of depression and anxiety in a sample of diabetic patients in Sharjah, United Arab Emirates	Psychological distress prevalence and its correlates	Cross-sectional study	Mini clinics (Primary health care centres); Sharjah hospitals	347 diabetics; Majority were females (65.4%); Age group: Mean age was 53.2	Prevalence Depression prevalence score: 19 = 12.5%; 24% demonstrated diabetes complications; Mental health status and diabetic complications are strongly associated. Mental health needs improvement in terms of comprehensive diabetes management plans to improve long term outcomes of these patients.	
Ghubach et al. [4]	2010	UAE University, Al Ain, UAE	Subjective life satisfaction and mental disorders among older adults in UAE in general population.	Association of physical and psychiatric disorders on life satisfaction	Qualitative face to face interviews	UAE	610 Arab older adults; (> 60 years) (males: 347 and 263: females)	Prevalence Depression (20.2%), anxiety (5.6%), hypochondriasis (4.4%), and organic brain syndrome with or without dementia (3.6%). Depressive disorder was associated significantly with less life satisfaction. There is a need to develop interventions that aid old individuals to deal more effectively with psychiatric disorders as well as its comorbidities; Family support is a key to prevent this condition among older population.	

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Al-Maskari et al. [49]	2011	United Arab Emirates University, Al/Ain, United Arab Emirates.	Prevalence of depression and suicidal behaviours among male migrant workers in United Arab Emirates	Suicidal behaviours and depression among male migrant workers	Cross-sectional survey	Labour camps; Al Ain city	319 contacted workers; 239 fully completed the DASS-42. Age group: (<20- ≥40 years)	Prevalence. Prevalence score >=10 ("depression") = 25.1% (60/239). Thoughts of suicide: 6.3% (20/261) Attempted suicide: 2.5% (8/265) Risk factors: Depression is associated with; Physical illness (97/301), less salary (203/314), working more than 8 hours (213/315), working in construction industry (124/304) Implementation and interventions at policy levels are needed for improving the conditions of working, such as working hours and minimum wages regulation.

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Justin Thomas et al. [50]	2011	Zayed University, Abu Dhabi, United Arab Emirates	Sunshine, sadness and seasonality: 25-hydroxyvitamin D, and depressive symptoms in the United Arab Emirates (UAE).	To explore the relationship between mood and vitamin D deficiency	Cross-sectional study design	Students in Zayed University in Abu Dhabi; UAE	197 female undergraduate students [Mean ages for summer and winter participants were 21.07 (s.d. 4.61), and 20.30 (s.d. 1.87)]	Depressive Symptoms The depressive symptoms peaks during the summer months. Seasonal variations in the severity of depressive symptoms was observed. The depression scores of summer cohorts (M = 16.85, s.d. = 11.25) being higher than winter cohort (M = 13.98, s.d. = 7.98). Prevention of depressive illness and mental health promotion are warranted in future.	
Thomas J, Altareb B. [51]	2012	Zayed University, Abu Dhabi, United Arab Emirates	Cognitive vulnerability to depression: an exploration of dysfunctional attitudes and ruminative response styles in the United Arab Emirates	To explore the generalizability of clinically influential models to Emirati citizens who reside in the United Arab Emirates (UAE)	Cross sectional survey using Arabic/English 40-item version of Weissman and Beck's Dysfunctional Attitudes Scale (DAS).	Abu Dhabi, United Arab Emirates.	450 undergraduates; Ages for males and females were: 19.93 years (SD = 1.59) and 19.93 years (SD = 1.88).	Risk factors: The results show that depression is associated with dysfunctional attitudes and ruminative response styles (RRS). This study therefore supports the generalization of depression theories which are clinically within a UAE context.	

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Hawamdah S, Almakhzoomy I, Hayajneh Y. [52]	2013	University of Sharjah, Sharjah, United Arab Emirates	Screening and correlates of depression and HbA1c in United Arab Emirates (UAE) women with diabetes	To investigate the socio-demographic characteristics of UAE diabetic and depressed women; To explore the difference between non-depressed and depressed with regards to glycaemic control	Cross-sectional study.	United Arab Emirates (UAE)	182 women; 92 subjects with Diabetes; Age groups: 18–75 years	Screening and Correlates of depression: Higher depression incidence was found in the diabetic women than non-diabetics. Positively significant relationship was found between higher depression levels and poor glycaemic control. In UAE, diabetic women sample; depression levels and national status were correlated; half of them showing poor glycaemic control (HbA1C levels > 7.5). Early depression detection among women is essential to increase the adherence to treatment regimens and glycaemic control.

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Mellal AA, Albluwe T, Al-Ashkar DA. [53]	2014	Al Ain University of Science and Technology, Abu Dhabi, UAE/ Al/Ain chain pharmacies	The prevalence of depressive symptoms and its socioeconomic determinants among university students in Al Ain, UAE	Determine the depression prevalence	Cross-sectional study	Al Ain, UAE	700 university students; Age group 17-25	Prevalence Depression prevalence: 22.2% Risk factors: Socioeconomic Determinants: age (highest rate observed in age group 17-25) Financial difficulties; overweight and obesity Additionally, mental health screening services should be offered to the University students to identify individuals at a higher risk for depression development
Alsaadi et al. [54]	2015	Sheikh Khalifa Medical City (SKMC), Abu Dhabi, UAE	Depression and anxiety among patients with epilepsy and multiple sclerosis: UAE comparative study	Depression and anxiety patients were screened to determine the rates of these conditions in patients with Epilepsy and Multiple Sclerosis	Cross sectional study	Epilepsy and MS clinics; Emirate of Abu Dhabi	186 depressive patients and 160 with anxiety Age group: (ages 18–65)	Epilepsy and Depression Epileptic patients were at a higher risk of depression; Anxiety and depression are probably encountered more frequently in epilepsy patients Multi-centre studies with a larger sample are needed in future to confirm the shared pathogenic mechanisms between depression and epilepsy

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Alsaadi et al. [55]	2015	Sheikh Khalifa Medical City (SKMC), Abu Dhabi, United Arab Emirates	Prevalence of depression and anxiety among patients with epilepsy attending the epilepsy clinic at Sheikh Khalifa Medical City, UAE: A cross-sectional study	The rates of anxiety and depression among epileptic patients were compared with the age- and sex-matched controls using standardized screening tools.	Cross-sectional study.	Epilepsy clinic (Sheikh Khalifa Medical City, UAE)	186 patients; Age groups Patients of ages 18–65	Management: 1/3rd of the patients scored under the range of depression and anxiety; 2/3rd of the patients with anxiety and depression did not prescribe to anti-anxiety or antidepressant medications. Epilepsy patients were at an almost twofold greater risk of having anxiety disorders and depression compared with controls. During the evaluation of epilepsy in all neurology clinics, screening for these strongly correlated conditions should be an adopted protocol.
Alsaadi et al. [56]	2017	American Centre for Psychiatry & Neurology/ Sheikh Khalifa Medical City (SKMC), Abu Dhabi, United Arab Emirates.	Potential factors impacting health-related quality of life among patients with epilepsy: Results from the United Arab Emirates.	To explore the potential factors that impact health related quality of life among patient with epilepsy	Cross sectional study	Sheikh Khalifa Medical City (SKMC).	160 epileptic adult patients; Age groups (18–65 years)	Epilepsy and Depression Depression, followed by seizure freedom, were known to be strongly correlated with HRQOL Screening for comorbid psychiatric disorders needs to be a crucial component of care standards, as well as an integrated plan of treatment for all patients suffering epilepsy.

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Gariballa S, Alessa A. [57]	2017	United Arab Emirates University (UAEU), Al Ain, United Arab Emirates.	Association between muscle function, cognitive state, depression symptoms and quality of life of older people: evidence from clinical practice	To explore the impact of low muscle function measure by handgrip strength on mental health of old individuals during recovery and acute illness.	Cross sectional study	UAE	432 randomly selected hospitalized older patients; Age groups ≥65 years	<p>Risk factor: 79% (308) had low muscle strength at baseline; Low muscle strength after age adjustment, disability, gender such as acute illness severity and body mass index with low muscle strength had higher symptoms of depression, quality of life, cognitive function compared with those with normal muscle strength the period of past 6-month ($p < 0.05$).</p> <p>Clinical trials on humans in future are needed to combine research with cellular and molecular investigation to understand in detail about the association between mental functions and muscles. The role of optimizing the dietary intake such as including increase physical activity and proteins specifically following acute illness on mental functions and muscle within the ageing population.</p>

Anxiety and Depression

Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Justin Thomas, Fatme Al-Anouti [58]	2017	Zayed University Abu Dhabi United Arab Emirates	Sun Exposure and Behavioural Activation for Hypovitaminosis D and Depression: A Controlled Pilot Study	Association between depressive symptoms and vitamin D (VTD) deficiency	Controlled Pilot Study.	UAE citizens from the University in Abu Dhabi.	114 College women; Mean age 20.83, SD = 3.98	Depressive Symptoms Positive findings were observed for depressive symptoms. Behavioural activation and sun exposure are effective strategies to alleviate depressive symptoms and status of VTD. SEBA appears to be a promising intervention targeting depression comorbid with hypovitaminosis D
Schulte SJ, Thomas J. [59]	2013	American University of Sharjah, UAE/ Zayed University, Abu Dhabi, United Arab Emirates	Relationship between eating pathology, body dissatisfaction and depressive symptoms among male and female adolescents in the United Arab Emirates	Relationship between body dissatisfaction, eating pathology symptoms, and depression was investigated.	Cross-sectional study	United Arab Emirates (UAE).	361 (284 females, 77 males) undergraduates	Depressive Symptomatology 73% (58% of males; 78% of females) indicated body dissatisfaction; 20% (22% males; 22% males) scored more clinical cut-off on the scale of eating pathology; In both genders, the depressive symptomatology was significantly predicted higher levels of eating pathology Adequate prevention strategies locally should address the needs for both males and females and potential depressive co-morbidity should also be considered.

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Justin Thomas, Salwa Al-Menhali, Majeda Humeidan [60]	2016	Zayed University, Abu Dhabi, United Arab Emirates	Compulsive buying and depressive symptoms among female citizens of the United Arab Emirates	To study the association of compulsive buying with depressive symptoms	Cross-sectional study	Female campus at a government-funded university in the Abu Dhabi,	Emirati college students (N= 100); Mean age of participants was 22.16	Depressive Symptomatology: Compulsive buying was associated with elevated levels of depressive symptomatology.
Amiri L, Voracek M, Yousef S, Galadari A, Yammahi S, Sadeghi MR, Eskin M, Dervic K. [61]	2013	United Arab Emirates University, Al Ain, UAE.	Suicidal behaviour and attitudes among medical students in the United Arab Emirates	To examine the attitudes and suicidal behaviour among medical students	Self-report survey.	United Arab Emirates (UAE).	115 medical students (mean age 20.7 years, 59.1% female)	Prevalence/Risk factor: Suicidal ideation prevalence: 17.5% Suicide attempts prevalence: 1.8%. The suicidal attempts and ideation prevalence among medical students were low in range when compared internationally. Negative attitudes toward suicide was interrelated by a strong support for a suicidal friend, and both were associated to religiosity.
Khandoker AH, Luthra V, Aboualaban Y, Saha S, Ahmed KIJ, Mostafa R, Chowdhury N, Jelinek HF. [62]	2017	Khalifa University, Abu Dhabi, United Arab Emirates.	Suicidal Ideation is Associated with Altered Variability of Fingertip Photo-Plethysmogram Signal in Depressed Patients	To study the relationship between "arterial pulse wave parameters" in patients who are depressed clinically either with or without suicidal ideation	Case control study	American Centre for Psychiatry and Neurology in Abu Dhabi.	29 controls, 16 major depressive disorder patients with (MDDSI+) and 16 patients without suicidal ideation (MDDSI-)	Diagnosis Tone-entropy based PPG variability is a best utilized diagnostic tool to identify suicidal ideation in depression patients.

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Khamis V. [63]	2007	United Arab Emirates University, Al/Ain, Abu Dhabi	Psychological distress among parents of children with mental retardation in the United Arab Emirates.	To identify the predictors of psychological distress and parental stress among parents of children with mental retardation in UAE.	Cross sectional survey in an interview format	United Arab Emirates (UAE).	225 mentally retarded children, of whom 113 were fathers and 112 were mothers; Age group: Parents ranged in age from 21 to 85 years	Risk factor Model including 3 predictor blocks, family environment, parents' socio-demographics, and child characteristics, accounted for 22.5% and 36.3% parents' psychiatric symptomatology variance and parental stress respectively. Lower socioeconomic level was associated with greater symptom rates of despair, cognitive disturbance, depression, and anxiety, among parents. The study provided interventions and preventions together with system-oriented counselling programs and parent trainings.
Ghubash R, Eapen V. [64]	2009	UAE University, Al/Ain, United Arab Emirates.	Postpartum mental illness: perspectives from an Arabian Gulf population	Perspectives of females with respect to postpartum mental illness.	Focus group discussion	Public sector clinic in Al Ain, Abu Dhabi, and a private clinic in Dubai	19 women of childbearing age Age Range 17 to 46 years (M age = 29 yr.)	Postnatal Depression Most of the females recognized postnatal depression to be a Jinn or Evil eye. They did not recognize postnatal depression as a psychological concern. There is a need to initiate awareness program among women and health professional training on the management and detection of postnatal depression.

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Al-Yateem N., Rossiter RC [65]	2017	University of Sharjah, Emirate of Sharjah, United Arab Emirates	Unstructured play for anxiety in paediatric inpatient care.	To study the effects of unstructured play activities on the anxiety levels of hospitalized children.	Pretest posttest design	Large paediatric referral centre in the United Arab Emirates	Children (N = 165) ages 4-7 years/ Control group (n = 84) and experimental group (n = 81)	Management The play intervention implemented by nurses resulted in clinically and statistically significant decrease in the levels of anxiety of children	
Abou-Saleh MT, Anderson DN, Collins J, Hughes K, Cattell RJ, Hamon CG, Blair JA. [66]	1995	Department of Psychiatry and Behavioural Sciences, United Arab Emirates University, Al Ain, UAE.	The role of pterins in depression and the effects of anti-depressive therapy.	To investigate the role of pterins in depression and the effects of anti-depressive therapy	Case control study	United Arab Emirates University, Al Ain, UAE.	48 patients with depression and 26 healthy control subjects	Treatment had a significantly higher ratio of neopterin / biopterin (N: B) than control subjects Significant correlation was observed between N: B ratios and severity of depression and plasma cortisol. As a ratio of N: B implies failure to convert neopterin to biopterin.	
El-Rufaie OE, Absood GH, Abou-Saleh MT. [67]	1997	Department of Psychiatry and Behavioural Sciences, Faculty of Medicine and Health Sciences, United Arab Emirates University, Al Ain.	The primary care anxiety and depression (PCAD) scale: a culture-oriented screening scale.	To address the construction of a screening scale for states of anxiety and depression among primary health care	Cross sectional study	Al Ain, United Arab Emirates (UAE).	217 patients,	The scale correlated more strongly with the psychiatrist's clinical judgement than the general practitioners' assessments	

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Ghubash et al [68]	2000	Department of Psychiatry & Behavioral Sciences, Faculty of Medicine & Health Sciences, UAE University, Al Ain, United Arab Emirates.	The performance of the Centre for Epidemiologic Study Depression Scale (CES-D) in an Arab female community.	To investigate the psychometric properties of the Arabic version of the CES-D.	Cross sectional study- Factor Analysis	Al Ain, United Arab Emirates (UAE).	Young Arab female populations (n =450);	The scale was completed by 75% (n = 350) of the subjects. It was found that the alpha coefficient was 0.88 and that the divided half reliability was 0.83. The reliability of the average re-test (ICC= 0.59). Analysis of the factor yielded three factors: interpersonal issues, mixed affective / somatic factor, and factor of positive effect. The mean total score differed significantly between depressed and non-depressed.
Bahi A, Al Mansouri S, Al Memari E, Al Ameri M, Nurulain SM, Ojha S. [69]	2014	United Arab Emirates University, Al Ain, United Arab Emirates.	β -Caryophyllene, a CB2 receptor agonist produces multiple behavioural changes relevant to anxiety and depression in mice.	To test the effects of the CB2 receptor potent-selective agonist β -caryophyllene (BCP) in animals subjected to models of anxiolytic- and antidepressant-like effects	Experimental study	Al Ain, United Arab Emirates	-	Results indicated that all parameters observed in the EPM test were improved by adult mice receiving BCP BCP increased the time spent in the centre of the arena significantly without altering the overall motor activity in the open field (OF) test. This dose also reduced the number of buried marbles and the amount of time spent digging in the MBT, suggesting an anti-compulsive effect.

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Alhammadi SM1, Hashem LA, Abusbeih ZR, Alzaabi FS, Alnuaimi SN, Jalabi AF, Nair SC, Carrick FR, Abdulrahman M. [70]	2017	Dubai Medical College, Dubai, United Arab Emirates.	Predictors of Postpartum Depression in Dubai, a Rapidly Growing Multicultural Society in the United Arab Emirates.	To entail the government and policy makers in the region to pay more attention to the apparently high prevalence of unrevealed PPD in the community	Cross sectional study	United Arab Emirates.	1,500 mothers were randomly approached, 808 accepted to participate and 504 included in the criteria for inclusion	A total of 168 women had an EPDS score of approximately 10, resulting in a gross prevalence rate of 33%. the suicidal ideation prevalence was 14 out of 504 (3%), of which 11 (79%) had an EPDS score of 0.10. In predicting the total EPDS score, this model was statistically significant $p < 0.0001$. Women's employment status, birth weight of the baby, stressful life event and marital conflict were predictors that were statistically significant.	
Dagan O, Facompré CR, Bernard K. [71]	2018	New York University - Abu Dhabi	Adult attachment representations and depressive symptoms: A meta-analysis.	To examine the extent to which adult attachment representations are associated with depressive symptoms.	Review study	United Arab Emirates	55 samples (N = 4,386).	Specifically, insecure-preoccupied individuals ($d = 0.48, 95\% \text{ CI } [0.30-0.65]$); but not insecure-dismissing individuals ($d = 0.09, 95\% \text{ CI } [-0.03-0.22]$), exhibited significantly more depressive symptoms than the secure-autonomous individuals.	

Anxiety and Depression

Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Hamdi E1, Amin Y, About-Saleh MT. [72]	1997	UAE University, Al Ain, United Arab Emirates.	Performance of the Hamilton Depression Rating Scale in depressed patients in the United Arab Emirates.	To evaluate the face validity of the HDRS-21 by studying symptom frequencies	Validity and reliability analysis	Al Ain, United Arab Emirates	100 UAE depressed patients	High levels of retardation and somatization contribute significantly to the total score in socially developing communities.
Dervic K, Garcia-Amador M, Sudol K, Freed P, Brent DA, Mann JJ, Harkavy-Friedman JM, Oquendo MA. [73]	2015	United Arab Emirates University, Al Ain, UAE	Bipolar I and II versus unipolar depression: clinical differences and impulsivity/aggression traits.	To investigate distinguishing features between bipolar I, II and unipolar depression, and impulsivity/aggression traits in particular.	Experimental	Al Ain, United Arab Emirates	Six hundred and eighty-five (n=685) patients in a major depressive episode	Compared to unipolar patients, BP-I and BP-II depressed patients were significantly younger at onset of their first depressive episode and were more likely to experience their first depressive episode before/at age of 15.
Abou-Saleh MT, Ghubash R, Karim L, Krymski M, Bhai I. [74]	1999	United Arab Emirates University, Al Ain, United Arab Emirates.	The role of pterins and related factors in the biology of early postpartum depression	Plasma tryptophan, other putative amino acids, cortisol, vitamin B12, folate, urinary bipterin (B) and neopterin (N) were measured.	Experimental study	Al Ain, United Arab Emirates	62 women in the early postpartum period, 23 pregnant and 38 non-gravid controls	Postpartum women were shown to have lower tryptophan, vitamin B12 and significantly higher levels of bipterins, neopterin, folate and cortisol than controls. A significant contribution was observed for low tryptophan to increased EPDS showing significant correlations with low tyrosine, low methionine, low N:B ratio and higher vitamin B12 levels.

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Daradkeh TK1, Ghubash R, Abou-Saleh MT. [75]	2002	United Arab Emirates University, Al Ain, United Arab Emirates.	Al Ain community survey of psychiatric morbidity II. Sex differences in the prevalence of depressive disorders.	To examine sex differences in the prevalence of depressive disorders in an Arab community.	Mixed method	Al Ain, United Arab Emirates	One thousand three hundred and ninety-four subjects	<p>The lifetime rates in males and females were 2.8 and 10.3%, respectively.</p> <p>F:M ratio found in this study is highest reported ratio in the literature.</p> <p>Sex, life events, chronic difficulties and to a certain extent age were found to be risk factors for depression in the studied community.</p> <p>The prevalence rates of depression were higher in females in all above categories, but such differences reached statistical significance in age category before 55, regardless of marital status, when the number of children is four or more and among those exposed to recent life events and chronic difficulties.</p> <p>Females were found to be more exposed to chronic life difficulties, but only depressed females were significantly more subjected to recent life events.</p>

Anxiety and Depression								
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings
Elhwuegi AS [76]	2004	Ajman University of Science and Technology Network, Abu Dhabi Campus, Abu Dhabi	Central monoamines and their role in major depression.	To study the role of central monoamines in major depression.	Review	UAE	-	Blocking the somatodendritic 5-HT(1A) or nerve terminal alpha (2) receptors proved to increase the response rate in the treatment. This super sensitivity might play a role in the mechanisms underlying antidepressant induced mood switch and rapid cycling.
El-Rufaie OE. [77]	2005	United Arab Emirates University, Al Ain, United Arab Emirates.	Primary care psychiatry: pertinent Arabian perspectives.	Pertinent Arabian perspectives	Review study	Al Ain, United Arab Emirates	-	Comorbidity and physical presentation in most instances contribute significantly to failure to detect psychiatric disorders. This will inevitably lead to unnecessary investigation and medication and the continuation of suffering for patients. Most psychiatric morbidity mainly in the form of anxiety and depressive disorders. among primary care patients passes undetected by the primary care practitioners.

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Gariballa S, Forster S. [78]	2007	United Arab Emirate University, UAE.	Effects of dietary supplements on depressive symptoms in older patients: a randomised double-blind placebo-controlled trial.	To examine the effect of nutritional support on older patient's cognitive function and depressive symptoms	A prospective, double-blind, placebo-controlled study	United Arab Emirate University, UAE.	225 hospitalised acutely ill older patients	<p>The effect of supplement was seen in all patient groups including those with no symptoms of depression, mild depression and those with severe depression ($p = 0.007$) at 6 months.</p> <p>There were significant differences in symptoms of depression scores in the supplement group compared with the placebo group at 6 months</p> <p>Randomisation to the supplement group led to a significant increase in red-cell folate and plasma vitamin B12 concentrations, in contrast to a decrease seen in the placebo group.</p>	
Gariballa S. [79]	2011	United Arab Emirates University, Al Ain, UAE.	Testing homocysteine-induced neurotransmitter deficiency, and depression of mood hypothesis in clinical practice.	To test homocysteine induced neurotransmitter deficiency, and depression	Randomised double-blind placebo-controlled trial	United Arab Emirates University, Al Ain, UAE.	Two-hundred and thirty-six hospitalised acutely ill older patients	<p>The mean Hcy concentration fell by 22% among patients given the supplements compared with the placebo group (mean difference 4.1 $\mu\text{mol/l}$ (95% CI: 0.14-8.03), $P = 0.043$). tHcy concentrations were divided into four quartiles and analysed against depression scores.</p>	

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Dubey VK, Ansari F, Vohora D, Khanam R. [80]	2015	Gulf Medical University, Ajman, United Arab Emirates.	Possible involvement of corticosterone and serotonin in antidepressant and anti-anxiety effects of chromium picolinate in chronic unpredictable mild stress induced depression and anxiety in rats.	To investigate the effects of chromium picolinate (CrP) on behavioural and biochemical parameters in chronic unpredictable mild stress (CUMS) induced depression and anxiety in rats	Review	UAE	-	The results suggested that increase in the concentration of 5-HT and decrease in plasma corticosterone levels could be responsible for improvement in symptoms of depression and anxiety. CrP (8µg/mL and 16µg/mL) also showed significant decrease in number of entries in open arm that shows anti-anxiety effect of CrP in CUMS rats.	
Chaudhury D, Liu H, Han MH. [81]	2015	New York University Abu Dhabi	Neuronal correlates of depression.	To define the molecular alterations associated with depression followed by neurogenesis and genetic modifications leading to structural modifications associated with depression-related synaptic plasticity.	Review	-	-	(MDD) is a common psychiatric disorder affecting approximately 121 million people worldwide and recent reports from the World Health Organization (WHO) suggest that it will be the leading contributor to the global burden of diseases	

Anxiety and Depression									
Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study population	Key findings	
Hamdi E, Amin Y, Abou-Saleh MT. [82]	1997	University, Al Ain.	Problems in validating endogenous depression in the Arab culture by contemporary diagnostic criteria.	Highlights the difficulties that may be encountered in attempting to apply the clinical construct of endogenous depression derived from western studies to depressed Arab patients	Mixed method	-	-	The descriptions of patients reveal that the mood component of depression is expressed differently, somatic metaphors are used frequently to express distress, religious elements influence the expression of symptoms, and depression may manifest in behaviours not directly indicative of the disorder.	
Abou-Saleh MT, Ghubash R. [83]	1997	United Arab Emirates University, Al Ain, United Arab Emirates.	The prevalence of early postpartum psychiatric morbidity in Dubai: a transcultural perspective	Prevalence of early postpartum psychiatric morbidity in Dubai: a transcultural perspective.	Cross sectional study	New Dubai Hospital in Dubai, United Arab Emirates	95 women admitted to one hospital in Dubai for childbirth	Prevalence of psychiatric morbidity was 24% according to the SRQ and 18% according to the EPDS. A number of psychosocial factors emerged as putative risk factors for postpartum psychiatric disturbance, including depressive illness.	
Sorgente et al. [84]	2016	Cleveland Clinic Abu Dhabi, Abu Dhabi	Negative concordance pattern in bipolar and unipolar recordings: An additional mapping criterion to localize the site of origin of focal ventricular arrhythmias.	To show a negative concordance in the initial forces of these EGMs is also helpful in predicting the SOO of premature ventricular contractions (PVCs).	Experimental	UAE	Mapping and radiofrequency (RF) ablation were performed in 41 patients with symptomatic PVCs in the absence of structural heart disease	A negative concordance pattern (NCP) in unipolar electrogram (UEGM) and a bipolar electrogram (BEGM) may be an additional criterion that helps to localize the site of origin (SOO) of focal ventricular arrhythmias.	

Table 6: Published research papers on Anxiety, Dissociative, Stress-Related, Somatoform and other Nonpsychotic Mental Disorders in UAE

Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study populationw	Key findings
Shetty RM, Gadekar TR. [85]	2018	Gulf Medical University, United Ajman, United Arab Emirates.	RMS tactile scale: An innovative tactile anxiety scale for visually impaired children.	To validate and assess the efficacy of RMS-TS for visually impaired child and compare it with modified dental anxiety scale (MDAS) and Braille	Cross sectional/ Validity and reliability testing	Ajman, United Arab Emirates.	100 children of age 12-15 years	RMS-TS was a reliable scale to measure child's dental anxiety in visually impaired children. It can be used either in combination or alone with other techniques to improve dental anxiety assessment.
Guraya SY, Guraya SS, Habib F, AlQuilici KW, Khoshhal KI. [86]	2018	Clinical Sciences Department, College of Medicine, University of Sharjah, Sharjah, UAE.	Medical students' perception of test anxiety triggered by different assessment modalities.	The varying level of anxiety test provoked by each exam modality were stratified and the student's perceptions about confounding factors were explored.	Cross sectional study	University of Sharjah, Sharjah, UAE.	Medical students	The examiner-based assessment modalities induced high test anxiety. Faculty is urged to cover core contents within stipulated time and to rigorously reform and update existing curricula to prepare relevant course material.
Shetty RM, Pashine A, Jose NA, Mantha S. [87]	2018	Gulf Medical University, Ajman, Abu Dhabi.	Role of Intelligence Quotient (IQ) on anxiety and behavior in children with hearing and speech impairment.	To assess and compare the role of IQ on anxiety and behavior of children with or without hearing and speech impairment	Case control studies	University, Ajman, Abu Dhabi.	120 children of age group 7-14 years [60 normal healthy children and 60 hearing and speech impaired children]	Children with hearing and speech impairment are less anxious and more cooperative compared to normal healthy child in the dental setting and are, therefore, easier to manage.
Abu-Hilal MM. [88]	2000	United Arab Emirates University, Al Ain, United Arab Emirates.	A structural model for predicting mathematics achievement: its relationship with anxiety and self-concept in mathematics.	A model of mathematics achievements and its association to antecedent and subsequent factors using structural equations modelling was examined.	Survey	Al Ain, United Arab Emirates.	Elementary school students in Al Ain school district (n = 394)	The hypothesized model explained 40%, 64%, and 73% of the variance in achievement, self-concept, and anxiety, respectively. The results can be interpreted as indicating that achievement is an important outcome and antecedent construct within the proposed model.

Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study populationw	Key findings
Bahi A. [89]	2017	Department of Anatomy, Tawam Medical Campus, United Arab Emirates University, Al Ain, United Arab Emirates.	Environmental enrichment reduces chronic psychosocial stress-induced anxiety and ethanol-related behaviors in mice.	To determine whether an enriched environment could have "curative" effects on chronic psychosocial stress-induced ethanol intake and CPP.	Elevated plus maze (EPM) experimental test	Al Ain, United Arab Emirates	Experimental mice "intruders" were exposed to the chronic subordinate colony (CSC) housing for 19 consecutive days in the presence of an aggressive "resident" mouse.	EE can reduce voluntary ethanol intake and ethanol-induced conditioned reward that seems to be one of the strategies to reduce the behavioral deficits and the risk of anxiety-induced alcohol abuse.
Bahi A [90]	2017	United Arab Emirates University, Al Ain, United Arab Emirates.	Decreased anxiety, voluntary ethanol intake and ethanol induced CPP acquisition following activation of the metabotropic glutamate receptor 8 "mGluR8".	To measure anxiety and spontaneous behavior in C57BL/6J mice after systemic injection of the selective mGluR8 agonist (S)-3,4-dicarboxyphenylglycine ((S)-3,4-DCPG).	Elevated plus maze (EPM), open field (OF) and light-dark box (LDB) tests	Al Ain, United Arab Emirates.	Mice	The results suggested that mGluR8-targeted pharmacotherapies may be beneficial for the treatment of alcoholism and anxiety.
Ennaceur A, Hussain MD, Abuhamdah RM, Mostafa RM, Chazot PL. [91]	2017	Sharjah University, Basic Medical Science Department, College of Medicine, United Arab Emirates.	Slope climbing challenges, fear of heights, anxiety and time of the day.	To investigate this risk avoidant behavior in mice	Experimental	Sharjah University, United Arab Emirates.	Mice	Mice spent more time in the areas adjacent to the slopes than in the areas adjacent to void Platform from the ground reduced the crossings onto the slopes in C57BL/6J and CD-1, and no differences were observed between BALB/c and C57BL/6J

Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study populationw	Key findings
Shaban S, Aburawi EH2, Elzubeir K, Elango S, El-Zubeir M. [92]	2016	UAE University, Al Ain, UAE.	Factors influencing medical students' self-assessment of examination performance accuracy: A United Arab Emirates study.	The self-assessment accuracy of medical students was examined with respect to their capability to assess their own performance on an MCQ examination.	Interventional study	College of Medicine and Health Sciences, United Arab Emirates University	1 st and 2 nd year medical students	Gender, self-reported preparation and confidence are associated with self-assessment accuracy. Reinforce existing evidence indicating that medical students are poor self-assessors There are potentially multiple explanations for misjudgment of this multidimensional construct that require further investigation and change in learning cultures.
Bahi A1, A Mansouri S, Al Maamari E. [93]	2016	United Arab Emirates University, Al Ain, United Arab Emirates.	Nucleus accumbens lentiviral-mediated gain of function of the oxytocin receptor regulates anxiety- and ethanol-related behaviors in adult mice.	To examine anxiety and the behavioral responses to ethanol in C57BL/6 mice stereotaxically injected in the nucleus accumbens (NAcc) with lentiviral vectors expressing an empty vector (Mock) or the OxtR cDNA	Experimental - elevated-plus maze, the open-field and the marble-burying tests	Al Ain, United Arab Emirates	Adult mice	OxtR manipulation may be a relevant strategy to address ethanol use disorders.
Bahi A. [94]	2016	Department of Anatomy, College of Medicine & Health Sciences, United Arab Emirates University, Al Ain, United Arab Emirates.	Sustained lentiviral-mediated overexpression of microRNA124a in the dentate gyrus exacerbates anxiety- and autism-like behaviors associated with neonatal isolation in rats.	To address a stress model showing that neonatal isolation-induced long-lasting hippocampal elevation of miR124a which was associated with reduced expression of its target BDNF mRNA	Experimental	Al Ain, United Arab Emirates.	Rats isolated from the dams on PND 1 to PND 11	Across both autism- and anxiety-like behavioral assays, miR124a overexpression in the DG significantly exacerbated repetitive behaviors, social impairments and anxiety with no effect on locomotor activity. Our novel findings attribute neonatal isolation-induced cognitive impairments to induction of miR124a and consequently suppressed BDNF mRNA, opening venues for intercepting these miR124a-mediated damages

Author/Ref	Year	UAE institution affiliation:	Title	Aim	Study design	Settings	Study populationw	Key findings
Al-Yateem N, Brenner M, Shorrab AA, Docherty C. [95]	2016	College of Health Sciences, University of Sharjah, Sharjah, United Arab Emirates. University Hospital Sharjah, Sharjah, United Arab Emirates.	Play distraction versus pharmacological treatment to reduce anxiety levels in children undergoing day surgery: a randomized controlled non-inferiority trial.	To explore the efficiency of storytelling, pictures and coloring activities as an anxiolytic intervention compared with the traditional pharmacological premedication approach in a non-inferiority study.	Randomized non-inferiority-controlled trial	Sharjah, United Arab Emirates.	168 children scheduled for day surgery	The distraction technique used can be considered as an efficient alternative to traditional pharmacological premedication for children undergoing day surgery.
Fakhruddin KS, E Batawi H, Gorduyus MO. [96]	2015	College of Dental Medicine, University of Sharjah, Sharjah, United Arab Emirates.	Effectiveness of audiovisual distraction eyewear and computerized delivery of anaesthesia during pulp therapy of primary molars in phobic child patients.	To assess the effectiveness of audiovisual distraction technique with video eyewear and computerized delivery system-intranasular (CDS-IS) during the application of local anesthetic in phobic pediatric patients undergoing pulp therapy of primary molars.	Randomized, crossover clinical study	Sharjah, United Arab Emirates	60 children aged between 4 and 7-year-old (31 boys and 29 girls)	The use of audiovisual distraction with video eyewear and the use of CDS-IS system for anesthetic delivery was demonstrated to be effective in improving children's cooperation, then routine psychological interventions and is, therefore, highly recommended as an effective behavior management technique for long invasive procedures of pulp therapy in young children.
Hisham Yehia El Batawi [97]	2015	University of Sharjah, Sharjah, UAE	Effect of preoperative oral midazolam sedation on separation anxiety and emergence delirium among children undergoing dental treatment under general anaesthesia	To investigate the possible effects of preoperative oral Midazolam on parental separation anxiety, emergence delirium, and post-anaesthesia care unit time on children undergoing dental rehabilitation under general anaesthesia.	Randomized, prospective, double-blind study.	Jeddah, Saudi Arabia	Seventy-eight American Society of Anesthesiology (ASA) I children were divided into two groups of 39 each	Preoperative oral Midazolam could be a useful adjunct in anxiety management for children suffering from dental anxiety. The drug may not reduce the incidence of postoperative emergence delirium. The suggested dose does not seem to affect the post-anaesthesia care unit time.

Table 7: Published research papers on Behavioural Syndromes Associated with Physiological Disturbances and Physical Factors in UAE

Eating Disorder									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Thomas J, Khan S, Abdulrahman AA. [98]	2010	Zayed University, Abu Dhabi, United Arab Emirates.	Eating attitudes and body image concerns among female university students in the United Arab Emirates	To address the prevalence of abnormal eating attitudes and their association with body image concerns.	Correlational study design	Zayed University in the UAE	228 female students; mean age of 19.84 years	<p>Prevalence Score above the EAT-26 cut-off: 24%</p> <p>Participants dissatisfied with their current estimated body image: 74.8%</p> <p>Eating attitudes were correlated positively with body image dissatisfaction, and negatively correlated with body image ideals.</p> <p>Disordered eating attitudes in current population arise from ultra-thin body image ideals and body image dissatisfaction.</p>	
Sabrina Janine Schulte, Justin Thomas [99]	2013	American University of Sharjah/ Zayed University, Abu Dhabi, UAE	Relationship between eating pathology, body dissatisfaction and depressive symptoms among male and female adolescents in the United Arab Emirates	The association between depression, body dissatisfaction and symptoms of eating pathology was assessed.	Cross-sectional study	United Arab Emirates (UAE)	361 (284 females, 77 males) undergraduates; mean age was 19.9.	<p>Psychological risk factor Body dissatisfaction was indicated by 73% of the sample, while 20% scored above the clinical cut off on the scale of eating pathology. In both the genders, depressive symptomatology predicted significantly higher eating pathology levels. Among adolescents the body dissatisfaction and eating disturbances are of great concern.</p> <p>The study recommended local eating disorders prevention strategies that should address the needs for both males and females along with considering potential depressive co-morbidity.</p>	

Eating Disorder									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Musaiger AO, Al-Mannai M, Al-Lalla O. [100]	2014	Ministry of Education, Dubai, UAE	Risk of disordered eating attitudes among male adolescents in five Emirates of the United Arab Emirates.	To highlight the prevalence of disordered eating attitudes among male adolescents in the United Arab Emirates (UAE).	Cross sectional study	Emirates of Dubai and Al-Fujairah	731 male students from 5 emirates of UAE Age range: 15-18 years	Risk factors The disordered eating attitudes proportion in UAE was relatively higher than several other developed and developing countries ranging from 33.1% to 49.1%. student living in Al-Fujairah and Dubai have double risk of having disordered eating attitudes than students living in the other Emirates. The need for screening adolescents for eating disorders and increased awareness as well as understanding of eating disorders and their associated risk factors in all male adolescents in the UAE.	
Schultze SJ. [101]	2016	American University of Sharjah, United Arab Emirates	Predictors of binge eating in male and female youths in the United Arab Emirates	To examine key predictors of binge eating and prevalence rates among youths.	Survey; three online-based assessments	UAE	254 youths; Mean age: 19.78	Prevalence One third of the participants reported moderate to severe binge eating. Body related guilt and emotional eating were the most powerful and consistent eating predictors. Whereas, body related shame and stress were statistically significant predictors during follow up. Common concern among youth in UAE included binge eating with prevalence rates like western sample.	

Eating Disorder								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
O'Hara L, Tahboub-Schulte S, Thomas J. [102]	2016	Emirates College of Advanced Education, Abu Dhabi, United Arab Emirates; American University of Sharjah, Sharjah, United Arab Emirates; Zayed University, Abu Dhabi, United Arab Emirates.	Weight-related teasing and internalized weight stigma predict abnormal eating attitudes and behaviours in Emirati female university students	The association between self-esteem, internalized weight stigma, weight teasing, and abnormal eating attitudes were examined in UAE.	Cross-sectional study	United Arab Emirates	420 female Emirati undergraduate students (Mean age = 23.12 years).	Social Risk factor Eating disorder symptomatology: 30% Respondents frequently teased about their weight: 44% Symptomatology of eating disorders was correlated positively with being bothered by teasing from friends, family, and others, and internalized weight stigma. Body related shame and guilt, and weight is the strongest predictor of eating disorder.
Thomas J, O'Hara L, Quadflieg S, Weissgerber SC. [103]	2017	Zayed University, Abu Dhabi, United Arab Emirates. Emirates College for Advanced Education, Abu Dhabi, United Arab Emirates. New York University, Abu Dhabi, United Arab Emirates.	Acculturation, out-group positivity and eating disorders symptoms among Emirati women	To examine an association between eating disorders symptoms, in-group/out-group evaluations, and Western acculturation was explored among female citizens.	Westernization Survey, Eating Attitudes Test (EAT-26).	United Arab Emirates (UAE).	Emirati college women (N = 209; Mean age 25.36 years (SD = 4.51)	Social Risk factor Out group positivity was associated with higher levels of symptoms related to eating disorder. Western acculturation was correlated positively with the symptoms of eating disorders.
Thomas J, O'Hara L, Tahboub-Schulte S, Grey H, Chowdhury N. [104]	2017	Zayed University, Abu Dhabi, UAE; Abu Dhabi University, Abu Dhabi, UAE; American University of Sharjah, Sharjah, UAE.	Holy anorexia: Eating disorders symptomatology and religiosity among Muslim women in the United Arab Emirates	To examine the association among medical college women from UAE.	Cross sectional study	United Arab Emirates (UAE)	N = 1069; Mean age: 22.24 years	Risk factor A positive association between eating disorders symptoms and religiosity was reported. The scoring above the EAT-26 cut-off significantly reported greater religiosity levels. A heightened religiosity among young Emirati women might represent a vulnerability factor for eating disorders.

Eating Disorder									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Robin John Green et al. [105]	2015	Sheikh Khalifa Medical City, Abu Dhabi, United Arab Emirates. Wyeth Nutrition, Dubai, United Arab Emirates.	How to Improve Eating Behaviour during Early Childhood.	to clarify terminology of eating behaviour problems during early childhood	Review	United Arab Emirates (UAE)	-	Detailed history taking from parents and a thorough clinical examination by the health care worker are essential.	
Others in the Category: Sleep and Sexual Dysfunction									
El-Rufaije OE, Bener A, Abuzeid MS, Ali TA. [106]	1997	United Arab Emirates University, Al Ain, UAE.	Sexual dysfunction among type II diabetic men: a controlled study.	To determine the prevalence and nature of sexual dysfunction among a sample of type II diabetic men, in comparison with the control groups of hypertensive men and apparently healthy men with no chronic medical illness.	Sexual dysfunction semistructured questionnaire and a questionnaire designed for medical history and sociodemographic data.	UAE	Type II diabetic men	The estimated high prevalence rate of sexual dysfunction among the diabetic group (89.2%) was significantly greater than the hypertensive group (43.6%), and the apparently healthy group (16.7%).	
Alzaabi A, Fikal S, Moilothkandy R, Mahboub B, Nagelkerke N. [107]	2013	Zayed Military Hospital, Abu Dhabi, UAE, University of Sharjah, Sharjah, UAE. UAE University. Al Ain, UAE.	Obesity hypoventilation syndrome in obstructive sleep apnea patients in the United Arab Emirates: a retrospective cross-sectional study.	To estimate the frequency of symptoms of obesity hypoventilation syndrome (OHS) in patients with obstructive sleep apnoea (OSA) and its associated comorbidities	Retrospective study based on patients' medical record	Respiratory Care Unit and Sleep Disorder Centre of the Zayed Military Hospital United Arab Emirates	212 adult patients	Women were more frequently affected than men (31.8% [7/22] vs. 12.9% [11/85], respectively; $p = 0.03$) and tended to be older than affected men, with a mean age of 55 ± 10.6 years versus 46 ± 13 for men. After adjustment for gender, OHS was significantly associated with hypertension ($OR = 3.5$; $p = 0.03$), diabetes mellitus ($OR = 4.6$; $p = 0.02$), ischaemic heart disease ($OR = 5.1$; $p = 0.04$) and pulmonary hypertension ($OR = 16.1$; $p = 0.001$).	

Eating Disorder								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Al-Mardini M, Aloul F, Sagahyroon A, Al-Husseini L. [108]	2014	American University of Sharjah, Sharjah, United Arab Emirates	Classifying obstructive sleep apnea using smartphones.	The study implemented a reliable, comfortable, inexpensive, and easily available portable device that allows users to apply the OSA test at home without the need for attended overnight tests.	Experimental	UAE	15 samples	100% of patients were correctly identified as having the disease, and 85.7% of patients were correctly identified as not having the disease.

Table 8: Published research papers on Intellectual Disability (Idiopathic) in UAE

Intellectual Disability								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Turky A, Felce D, Jones G, Kerr M. [109]	2011	Al-Amal mental health Hospital, Ministry of Health, Dubai, United Arab Emirates	A prospective case control study of psychiatric disorders in adults with epilepsy and intellectual disability.	To determine prospectively the influence of epilepsy on the development of psychiatric disorders in adults with ID.	Prospective study	Dubai, United Arab Emirates.	45 adults with ID and 45 active epilepsy and 45 adults with ID without epilepsy	Adults with epilepsy and ID had a more than seven times increased risk for developing psychiatric disorders, particularly depression and unspecified disorders of presumed organic origin, including dementia, over a 1-year period compared to those with ID only. Comparison of the psychiatric scores showed the epilepsy group to have significantly higher unspecified disorder and depression symptom scores.

Intellectual Disability									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Dukmak S. [110]	2009	United Arab Emirates University, Al Ain	Parent adaptation to and parenting satisfaction with children with intellectual disability in the United Arab Emirate	To investigate the impact that children with intellectual disability in UAE may have on their families.	Cross sectional study	United Arab Emirates	Sixty-three parents; 15 students with intellectual disability was selected randomly from each centre (A total of 105 students aged 6 to 18 years).	Risk factors A significant association exist between family adaptation, emotional focused coping, and between parenting satisfaction and problem-focused coping. Therefore, this study advanced our understanding of family response to a child with an intellectual disability in Arab cultures.	
Komara M, Al-Shamsi A M, Ben-Salem S, Ali BR, Al-Gazali L. [111]	2015	United Arab Emirates University, Tawam Hospital, Al Ain	A Novel Single-Nucleotide Deletion (c:1020delA) in NSUN2 Causes Intellectual Disability in an Emirati Child	The study examined an Emirati consanguineous family with a patient diagnosed with ID	Experimental Study	United Arab Emirates	An Emirati consanguineous family Age: 16 years	Genetic factors A homozygous variant c.1020delA in NSUN2 gene was found. Mutation of c.1020delA in NSUN2 is most likely the cause of ID in Emirati patient.	
Bastaki F, Nair P, Mohamed M, Malik EM, Helmi M, Al-Ali MT, Hamzeh AR. [112]	2017	Dubai Health Authority, Dubai Centre for Arab Genomic Studies, Dubai	Identification of a novel CTCF mutation responsible for syndromic intellectual disability - a case report.	This study presented molecularly and clinically, an Emirati patient with de novo frameshift mutation in CTCF.	Experimental Study	United Arab Emirates	An Emirati patient; 3.5 years of age	Genetic factors The study compared clinical picture of the individual with previously reported MRD21 cases. The study revealed many common symptoms and some other new ones that were not detected in the past. Thus, assisting to further define the molecular underpinnings and rare conditions.	
Akawi et al [113]	2016	United Arab Emirates University, Al Ain, United Arab Emirate.	A homozygous splicing mutation in ELAC2 suggests phenotypic variability including intellectual disability with minimal cardiac involvement.	To describe a highly inbred consanguineous Pakistani family with multiple affected children in 2 branches exhibiting moderately severe global developmental delay	Experimental study	UAE	5 individuals in two branches affected by intellectual disability and developmental delay.	The patient exhibited intellectual disability as the main feature with minimal cardiac involvement. Therefore, our findings expand the phenotypic spectrum of ELAC2-associated disorders illustrating clinical heterogeneity of mutations in this gene.	

Intellectual Disability								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Anazi et al. [114]	2017	Tawam Hospital, Al Ain, United Arab Emirates.	Expanding the genetic heterogeneity of intellectual disability.	To describe the phenotypic and genetic findings of 68 families (105 patients) all with novel ID-related variants.	Experimental study	UAE	68 families (105 patients) all with novel ID-related variants	The study highlighted MADD and PCDHGA10 as particularly compelling candidate and NCKAP1 as another compelling candidate in a large family. The study expands the locus and allelic heterogeneity of ID and demonstrates the power of positional mapping to reveal unusual mutational mechanisms.
Vetrini et al [115]	2019	United Arab University, Al Ain, UAE. Tawam Hospital, Al Ain, UAE	De novo and inherited TCF20 pathogenic variants are associated with intellectual disability, dysmorphic features, hypotonia, and neurological impairments with similarities to Smith-Magenis syndrome.	Clinical or molecular and analyses was used to determine the inheritance of the pathogenic variant alleles and studied the spectrum of phenotypes.	Genome-wide analyses by exome sequencing (ES) and chromosomal microarray analysis (CMA)	UAE	31 unrelated families including one family with a set of affected monozygotic twins; four affected heterozygous parents from these families.	25 unique inactivating single nucleotide variant of TCF20 were observed [1 missense, 1 canonical splice-site variant, 18 frameshift, 5 nonsense, and 4 deletions]. In unrelated families, two pathogenic loss-of-function variants were recurrent. Patients presented with a phenotype characterized by intellectual disability, developmental delay, variable dysmorphic features, movement disorders, hypotonia, and sleep disturbances.
Akawi N, Ben-Salem S, Lahti L, Partanen J, Ali BR2, A-Gazali L. [116]	2016	United Arab Emirates University, Al Ain, United Arab Emirates.	A recessive syndrome of intellectual disability, moderate overgrowth, and renal dysplasia predisposing to Wilms tumour is caused by a mutation in FIBP gene.	To identify the genetic etiology and the pathogenetic mechanism underlying a rare autosomal recessive overgrowth syndrome in three affected siblings	Experimental study	United Arab Emirates University, Al Ain,	Three affected siblings	One patient: homozygous nonsense mutation in FIBP exhibiting an overgrowth syndrome with multiple congenital abnormalities.

Table 9: Published research papers on Autism Spectrum Disorder in UAE

Autism									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Eapen V, Mabrouk AA, Zoubeidi T, Yunis F. [117]	2007	UAE University, United Arab Emirates.	Prevalence of pervasive developmental disorders in preschool children in the UAE	To determine the prevalence of developmental disorders.	First stage: Autism Screening Questionnaire Second stage: Clinical interview,	Arabian Gulf region including UAE	694; three-year-old UAE nationals	<p>Prevalence The autistic features are interrelated with family history of developmental delay, presence of behavioural problems, and males. Autistic features were observed in 58 per 10,000 children. For a DSM-IV diagnosis of pervasive developmental disorder (PDD); weighted prevalence was estimated to be 29 per 10,000. Lack of recognition of such disorders indicates a need for a comprehensive screening programs as diagnosing early can open doors for early intervention which can relatively improve the prognosis.</p>	
Jaber MA. [118]	2011	Ajman University of Science & Technology, Al Jurf campus, Ajman, United Arab Emirates.	Dental caries experience, oral health status and treatment needs of dental patients with autism	To determine the if autistic children have higher periodontal problems, higher caries prevalence, or more treatment needs than children of a control group of non-autistic patients. To develop baseline data to enable future planning and comparison of the dental services to autistic children.	Case control study	Dubai and Sharjah Autism Centres	61 patients with autism (45 males and 16 females) aged 6-16 years	<p>Risk factor The autism group had a male-to-female ratio of 2.8:1. Autistic children have significantly higher filled, missing or decayed teeth than affected patients and they required more restorative dental treatment significantly. The Met Need Index (MNI) and restorative index (RI) for autistic children were 0.3 and 0.02 respectively. Similarly, 97.0% (59/61) of the autistic children had gingivitis. Autistic children exhibited some extensive unmet needs for dental treatments, poor oral hygiene or higher caries prevalence than non-autistic healthy control group. For young people and children, oral health programs are needed to focus on optimum prevention.</p>	

Autism								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Jaber MA, Sayyab M, Abu Fanas SH. [119]	2011	College of Dentistry, Ajman University of Science and Technology, Ajman, United Arab Emirates	Oral health status and dental needs of autistic children and young adults	To address the treatment needs and caries experience of autistic children 6-16 years in UAE. To provide baseline data at regional and national level to enable future planning and comparison of dental services for autistic children.	Cross sectional study	Day centre in Sharjah, United Arab Emirates	Sixty-one autistic children aged 6-16 years (45 males and 16 females)	Risk factor Overall mean for filled teeth, missing teeth, filled teeth/decayed, missing, and decayed was 2.4. The percentage of filled teeth, missing, or decayed teeth increased with increasing age. The restorative index and met need index for the autistic children aged 11-15 years were 0.02 and 0.10, respectively. Oral health promotion strategies should be effectively implemented to improve the oral health status of autistic children.
Attlee A, Kassem H, Hashim M, Obaid RS. [120]	2015	College of Health Sciences, University of Sharjah, United Arab Emirates	Physical Status and Feeding Behaviour of Children with Autism	To assess the feeding behaviour and physical status among autistic children.	Cross sectional study	Sharjah Autism Centre, UAE	23 autistic children -Aged 5-16 years	Risk factor Male-female ratio of autism in the sample was 3.6:1. Five children were overweight, and 12 children were obese. Higher male with autism enrolment was found and three-fourth of the total children had hardships in maintaining the normal body weight. Concerns of mealtime behaviour were occasionally displayed such as unwillingness to try new foods, rigidity in mealtime routines, and not being able to be seated until the meal was finished.

Table 10: Published research papers on Attention deficit hyperactivity disorder (ADHD) in UAE

Attention Deficit Hyperactivity Disorder									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Yousef S, Adem A, Zoubeidi T, Kosanovic M, Mabrouk AA, Eapen V. [121]	2011	UAE University, Al Ain, UAE.	Attention deficit hyperactivity disorder and environmental toxic metal exposure in the United Arab Emirates	To explore the effects of toxic metals on the behaviour of a child in Gulf regions.	Case control study	Al Ain Educational Zone, UAE	Eighteen children (n = 18) were diagnosed with ADHD using Diagnostic and Statistical Manual 4 th Edition (DSM-IV) criteria. 38.9% inattentive, 33.3% hyperactive and 27.8% combined type), and these children were compared with 74 children without ADHD for blood levels of heavy metals; Age range 5–15 years	Environmental Risk Factors The association between blood levels of Attention Deficit Hyperactivity disorder (ADHD) and heavy metals was explored in school aged children. The results demonstrated that Zinc (Zn), manganese (Mn) and blood concentrations of lead (Pb) were associated significantly with ADHD. Monitoring for exposure to the levels of heavy metals and education on potential child health hazards are interrelated.	
Alkhateeb JM, Hadidi MS, Alkhateeb AJ. [122]	2016	-	Inclusion of children with developmental disabilities in Arab countries: a review of the research literature from 1990 to 2014	To analyse or review research undertaken on Inclusive Education (IE) in Arab countries	Systematic review	United Arab Emirates (UAE), Jordan, and Saudi Arabia	42 empirical studies; including children with developmental disabilities in Arab countries	Management The results demonstrate that limited Inclusive education research has been conducted in Arab countries. Researches in future are required to analyse Inclusive Education practices and show strategies for effective IE implementation in Arab countries.	
Sultan MA, Pastrana CS, Pajer KA. [123]	2018	Al Jalila Children's Specialty Hospital, Dubai, United Arab Emirates.	Shared Care Models in the Treatment of Pediatric Attention-Deficit/Hyperactivity Disorder (ADHD): Are They Effective?	To examine the effectiveness if the collaborative or shared care between mental health care providers and primary care providers with respect to the outcomes of adolescents and children with ADHD.	Systematic Review	Dubai, United Arab Emirates.	655 children and adolescents who had a diagnosis of ADHD	This review concludes that the current studies do not show strong evidence for the outcome of collaboration between PCPs and mental health professionals on ADHD management. Future research should consider providing education to PCPs on the management guidelines prior to conducting the trials, and more innovation is needed to discover collaboration methods that affect the direct ADHD care.	

Attention Deficit Hyperactivity Disorder									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Eapen V. Gururaj AK. [124]	2005	United Arab Emirates University, Al Ain, United Arab Emirates.	Risperidone treatment in 12 children with developmental disorders and attention-deficit/hyperactivity disorder.	To evaluate the safety and efficacy of risperidone in children with developmental disorder and behavioral problems including attention-deficit/hyperactivity disorder (ADHD)	Experimental	Al Ain Medical District of United Arab Emirates	Twelve patients aged 4 to 14 years who had a DSM-IV-diagnosed developmental disorder and ADHD along with other behavioral problems, in particular aggression	Risperidone may be a safe and effective treatment for adolescents and children with developmental disorder and disruptive behaviors.	

Table 11: Published research papers on Conduct disorders in UAE

Conduct Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Eapen V. Swadi H, Sabri S, Abou-Saleir M. [125]	2001	UAE University, Al Ain, United Arab Emirates.	Childhood behavioural disturbance in a community sample in Al Ain, United Arab Emirates.	To evaluate the prevalence of behavioural and emotional problems.	Cross-sectional study	Al Ain, United Arab Emirates.	620 United Arab Emirates nationals aged 6-18 years	The behavioural disturbance exists among a substantial number of school-aged children in the community. The prevalence of conduct problems was greater among boys, while emotional problems were more common among girls. Some of the behavioural disturbance include drug or alcohol use in a family member, family history of psychiatric illness, parental distress with respect to their children, and chronic life difficulties.	

Conduct Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Eapen V, Al-Sabosy M, Saeed M, Sabri S. [126]	2004	Faculty of Medicine, UAE University, Al Ain, United Arab Emirates.	Child psychiatric disorders in a primary care Arab population.	To determine the prevalence and nature of child psychiatric morbidity in primary care in the United Arab Emirates (UAE).	Cross sectional study	Al Ain United Arab Emirates (UAE).	Children aged 6 to 18 years visiting their primary care doctors	43% of the 278 children received a DSM-IV diagnosis. 74 (62%) were females and 46 (38%) were males. Participants consulting general practitioners for a primary psychiatric symptom = 1.1% (3/120) Common diagnosis included anxiety disorder followed by depression. <ul style="list-style-type: none"> ✓ Attention deficit hyperactivity disorder = 3% ✓ Conduct disorder= 7% ✓ Obsessive compulsive disorder =11% A statistically significant association was observed between DSM-IV caseness and female gender, relationship problems in the family, higher number of children in the household, physical illness and family history of psychiatric disorder.	
Al Banna A, Al Bedwawi S, Al Saadi A, Al Maskari F, Eapen V. [127]	2008	UAE University, Al Ain, United Arab Emirates	Prevalence and correlates of conduct disorder among inmates of juvenile detention centers, United Arab Emirates	To determine the prevalence and psychosocial correlates of conduct disorder among boys and girls admitted to detention centres in the UAE	Cross-sectional study	4 juvenile Detention centres, UAE	77 young people	The prevalence of conduct disorder was 24.7%, and recidivism, as indicated by repeat admissions to the centres, was found to be associated with conduct disorder.	

Table 12: Published research papers on Tourette syndrome in UAE

Tourette's Disorder									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Eapen, and Robertson [128]	2008	U.A.E. University, Al Ain, United Arab Emirates U.A.E. University, Al Ain, United Arab Emirates U.A.E. University, Al Ain, United Arab Emirates	Clinical Correlates of Tourette's Disorder Across Cultures: A Comparative Study Between the United Arab Emirates and the United Kingdom	To examine the presentation and clinical correlates of Tourette's disorder in 2 distinct populations, namely the United Kingdom and the United Arab Emirates.	Cohort study	Child Psychiatry clinics in Al Ain, United Arab Emirates (U.A.E.)	35 Tourette's disorder patients recruited from 2001 to 2005-- compared with 35 age- and gender-matched white Tourette's disorder patients.	A higher occurrence of behavioral symptoms was observed in the western sample has implications for our understanding of the phenotypic presentation of Tourette's disorder. Coprolalia, Comorbid oppositional defiant disorder and conduct disorder were higher in the U.K. cohort than UAE Cohort.	
Valsamma Eapen, Martin Laker, Anita Anfield, Jeremy Dobbs, and Mary M. Robertson [129]	2001	U.A.E. University, Al Ain, United Arab Emirates (Dr. Eapen) and the University College London, United Kingdom (Dr. Robertson)	Prevalence of tics and Tourette syndrome in an inpatient adult psychiatry setting	To evaluate the prevalence of TS or tics in a psychiatric inpatient population.	Semi structured interview; National Hospital Interview Schedule (NHIS) for the assessment of TS and related behaviours.	University College London Teaching Hospitals. (Camden and Islington Community Health Services NHS Trust)	Two hundred consecutive admissions to general adult psychiatric wards of University College London Teaching Hospitals.	Results reveal that: 200 patients had definite TS, 2 were observed to have motor tics; 10 had a history of tics (present for less than a year), 7 reported a family history of tics.	

Table 13: Published research papers on other psychiatric services in UAE

Psychiatry Services									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Salem MO, Saleh B, Yousef S, Sabri S. [130]	2009	UAE University, UAE.	Help-seeking patients's behaviours attending the psychiatric service	To study the help seeking patient behaviour referred to the psychiatric department of Al Ain Hospital	Descriptive cross-sectional epidemiological survey.	Psychiatric department of Al Ain Hospital	106 patients (52 males; 54 females)	<p>Help-seeking behaviours Consulted faith healers; 44.8% Individuals having previous experience: 31% Individuals reported some improvements but, the symptoms recurred later: 45% No improvement: 47% Current episode, symptom worsened: 8% Treatment received included: Prayer 70.2%; herbal 29.8% Primary care physician before presenting to secondary psychiatric care: 43.4%</p>	
Hamdy F. Moselhy and Mohamed Omar Salem. [131]	2009	UAE University, Al Ain.	Referrals to psychiatric service in United Arab Emirates: an analysis of the content of referral letters	To examine the appropriateness of referrals and the information quality presented in the referral document.	Retrospective descriptive survey of case notes	Psychiatric service at Al Ain Hospital	503 GP referrals; 309 males (61.4%) and 179 (35.6%) females Age group: 1 - ≥60 years	<p>Diagnosis Diagnosis was indicated in 380; It was not mentioned in 112 of the referral letters. Data missed: 11 GP diagnosis: 205(41.7%) Inaccurate diagnosis: 175 (35.6%) Psychiatrists to the GPs referrals: 29 patients (5.9%) Written replies: 4 Copies of the letter: 2 in the file; Reply not written: 460 cases; missing data: 14 In most of the referrals; physical examination and investigations were not mentioned.</p>	

Psychiatry Services								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Hamidi S, Aboualaban Y, Alhamad S, Meirambayeva A. [132]	2016	Hamdan Bin Mohammed Smart University, Dubai, United Arab Emirates/ American Centre for Psychiatry and Neurology, Abu Dhabi, United Arab Emirates.	Patient cost-sharing for ambulatory neuropsychiatric services in Abu Dhabi, UAE	To address the cost-sharing patterns of the patients, neuropsychiatric services utilization in Abu Dhabi and insurance coverage of ambulatory neuropsychiatric disorders.	Retrospective study from Health Authority-Abu Dhabi (HAAD) and the American Centre for Psychiatry and Neurology (ACPN) records, in Abu Dhabi.	Abu Dhabi	No. of visits: 57,824	Cost of neuropsychiatric services: Average cost per visit: 485 AED (\$132)- Cost paid by patient: 181 AED (\$49) Cost paid by insurance: 304 AED (\$83) Cost related to psychiatry services:44% Cost related to neurology services: 28% Cost related to psychotherapy services: 28%

Table 14: Published general research papers on mental disorders in UAE

General Research Papers on Mental Disorders								
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings
Kadayam G Gomathi, Soofa Ahmed, and Jayadevan Sreedharan [133]	2012	Gulf Medical University, Ajman, UAE	Psychological health of first-year health professional students in a medical university in the United Arab Emirates	To assess the psychological health of first-year health professional students and to study student stress sources.	Questionnaire-based survey; Response rate: 89.6%	Gulf Medical University (GMU) in Ajman, United Arab Emirates (UAE)	First-year students (N = 125)	Prevalence and risk factors Psychological morbidity prevalence: 33.6%. Main academic related stress sources include dealing with opposite sex members, anxiety, high parental expectations, worries regarding future. Issues related with health includes sleep-related issues, lack of exercise, and irregular eating habits. Psychological factors are associated significantly with demographic factors. Academics-related domain scores and total stress scores were significantly associated with psychological morbidity. Psychological morbidity was observed in 3 first-year students attending GMU. Worries regarding the parental and future expectations were a source of stress for many students.

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Jamshid Ahmadi, Mohammed Galal Ahmed, Fatehia Ali Bayoumi, Abeer Abdul Moneenun, and Haya Alshawa [134]	2012	Dubai Medical College for Girls, Dubai, United Arab Emirates.	Mental health of Dubai medical college students	To assess the psychiatric distress prevalence among medical students	Survey through General Health Questionnaire (GHQ)	Dubai Medical College.	Medical students (N=103) Age group 17-22 years	Prevalence Mean GHQ score: 16.46 GHQ mean < 16: 47 (45.6%) (in normal range) Psychiatric distress: 33 (32.1%) of the students Severe psychiatric distress: 23 (22.3%)	
Osman OT, Affi M. [135]	2010	United Arab Emirates University, Al Ain, United Arab Emirates.	Troubled minds in the Gulf: mental health research in the United Arab Emirates (1989-2008)	To explore the characteristics of the UAE mental health research from the year 1989 to 2008.	Systematic Review	Gulf Cooperation Council (GCC) countries and the UAE	Mental health studies included: 192	Research on mental health 1% of the GCC total biomedical research; Psychometric: 24.49% Epidemiological: 48.98% No study addressed research related to mental health systems. Studies on gender, ethnic, cross-cultural, interdisciplinary, and health promotion were underrepresented. Additional research is needed for more developing policies and international collaboration that interrelates researches conducted on services provided with longitudinal studies for testing the long-term impact of early preventive interventions.	
Al-Heeti KN, Hamid AA, Alghorani MA. [136]	2012	United Arab Emirates University, Al Ain, United Arab Emirates.	The Irrational Beliefs Inventory: psychometric properties and cross-cultural validation of its Arabic version	To address the psychometric properties of the adapted Irrational Beliefs Inventory (IBI-34) and initiating the process of examining its adequacy for usage in Arab Culture.	General Health Questionnaire and Beck Depression Inventory	United Arab Emirates University	Main analysis: 384 students; Cross-validation: 251 students Age group: 17 to 30 years	Screening. The adapted IBI-34 correlated negatively and significantly with General Health Questionnaire and Beck Depression Inventory to offer support for the concurrent validity. The scale can be utilized for both sexes by summing across all items to offer a total score that can be utilized as a general indicator of the irrational thinking.	

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Bidi F, Namdari-Pejman M, Kareshki H, Ahmadnia H. [137]	2012	Payame Noor University, Dubai, UAE.	The Mediating Role of Metacognition in the Relationship between Internet Addiction and General Health	To examine the mediating role of metacognitive variables in the association between general health and Internet addiction.	Cross sectional study with General Health Questionnaire (with a reliability of 0.89), Metacognition Questionnaire (with a reliability of 0.82), and Kimberly Young's Internet Addiction Test (with a reliability of 0.88).	Internet cafés in Abu Dhabi (the United Arab Emirates).	94 male and female users with different nationalities Age groups: Aged at least 18 years	General Health Questionnaire Positive association between aspects of Internet addiction and metacognition ($r = 0.30$; $P < 0.01$). Positive association was observed between general health and Internet addiction ($r = 0.47$; $P < 0.01$). A mediating role of meta-cognition in the association between internet addiction and low general health. The digital and internet technology have caused negative and unwanted effects which are classified as emerging damage. This association between general health and internet addiction has been confirmed in this research. The metacognitive processes can have a mediating and positive role on this association.	
Chowdhury N. [138]	2016	Abu Dhabi Health Authority	Integration Between Mental Health-Care Providers and Traditional Spiritual Healers: Contextualising Islam in the Twenty-First Century	To explore the association between mental illness with the 'religious viewpoints'	Review	United Arab Emirates	Emirati citizens; Age groups School going Children (6–18); Adults (18+); Seniors 60+	Risk factors Neuropsychiatric disorders contributed to 1/5 th of the global disease burden. Studies demonstrates UAE citizens apathy towards seeking professional mental health services which is related with the religious viewpoints on the issue, lack of confidence in mental health-care providers, lack of awareness of mental health, societal stigma, and religious viewpoints on the issue.	
Taoufik Alsaadi, Khadija E Hammasi, and Tarek M. Shahrour [139]	2015	Sheikh Khalifa Medical City (SKMC), Abu Dhabi, United Arab Emirates	Does pyridoxine control behavioural symptoms in adult patients treated with levetiracetam? Case series from UAE	The possible benefits of pyridoxine supplementation for treating behavioural side effects induced by LEV in patients attending epilepsy clinic.	Retrospective chart review	United Arab Emirates	41 men and 47 women [mean age: 34.2 years (SD = 11.1)]	Management Pyridoxine should be used as an effective option across all ages to treat individuals suffering from levetiracetam-induced behavioural side effects.	

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Hawamdeh S, Fakhry R. [140]	2014	University of Sharjah, Sharjah, United Arab Emirates.	Therapeutic relationships from the psychiatric nurses' perspectives: an interpretative phenomenological study.	To explore the attributed of the therapeutic association, form the viewpoint of psychiatric	Interpretive phenomenology; Unstructured recorded interviews with 17 nurses.	United Arab Emirates	17 nurses; Age groups 24- >55 years	Management The key themes explored included companionship, protection, conveying safety and security, and provision of physical care. The nurse focused on the significance of the therapeutic association. To improve the client outcomes, psychiatric nurses should internalize these themes in their practice. These themes should focus on psychiatric mental health nursing courses and management in nursing in the orientation of novel clinical psychiatric nurses.	
Al-Yateem N. Rossiter R., Robb W., Ahmad A., Elhalik MS, Albloshi S., Slewa-Younan S. [141]	2017	Ministry of Health and Prevention, Dubai, United Arab Emirates/ University of Sharjah, Sharjah, United Arab Emirates/ Latifa Hospital, Dubai, United Arab Emirates/ Shaikh Khalifa Medical City (SKMC), Abu Dhabi, United Arab Emirates.	Mental health literacy among paediatric hospital staff in the United Arab Emirates.	To explore the knowledge of healthcare professionals including nurses working in paediatric hospital settings in the UAE about helpfulness of treatment interventions for common mental health conditions.	Cross sectional survey design	United Arab Emirates	17 health care professionals; Age group: 20- >60 years	Mental Health literacy 40% of participants experienced moderate to high levels of psychological distress. Limited recognition of mental health disorders, ranging from 47% for PTSD to 54.3% for psychosis. Almost half of the participants were unable to accurately identify three mental illnesses (PTSD, depression with suicidal thoughts, and psychosis) and could not indicate the most appropriate care options.	

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Hamid AA, Musa SA. [142]	2017	United Arab Emirates University, Al Ain, United Arab Emirates	The mediating effects of coping strategies on the relationship between secondary traumatic stress and burnout in professional caregivers in the UAE	To examine an association between coping strategies, burnout, secondary traumatic stress among professional caregivers working in charity institutes, hospitals, schools, and welfare centres	Survey design using professional Quality of Life Questionnaire (ProQOL), The General Health Questionnaire (GHQ-28), The Maslach Burnout Inventory: Human Services Survey (MBI-HSS) and Endler and Parker's Coping Inventory.	United Arab Emirates (UAE)/ emirates of Dubai, Abu Dhabi, Sharjah, Ras Al Khaimah and Fujairah.	502 professional caregivers who work in schools (59.8%), hospitals (9.8%), social welfare centres (23.9%) and charity organizations (6.5%). Age group: Ages ranged between 23 and 60 years	Risk factors Compassion satisfaction, personal accomplishment and task-focused coping were associated negatively with secondary traumatic stress. Distraction coping, emotion-focused and burnout were positively associated with secondary traumatic stress. Coping partially mediated the association between secondary traumatic stress and burnout.	
Al-Darmaki F, Thomas J, Yaaqeib S. [143]	2009	Zayed University, Abu Dhabi, United Arab Emirates/ UAE University, Al Ain, United Arab Emirates.	Mental Health Beliefs Amongst Emirati Female College Students.	To explore the mental health beliefs (coping strategy, definition and causes) and help seeking attitudes/ barriers amongst female Emirati college students	Survey	National university in the UAE	Female college students (N = 70) Age group 18–42 years old,	Risk factors Social and environmental factors. Help seeking barriers include: Social stigma. Strategy to cope with mental health problems: Religious practices, Showing willingness to seek help from health professionals.	
Thomas J, Bentall RP, Hadden L, O'Hara L. [144]	2017	Zayed University, United Arab Emirates/ Emirates College for Advanced Education, United Arab Emirates.	Ethnic identity and paranoid thinking: Implicit out-group preference and language dominance predict paranoia in Emirati women.	To study an association between -group identity (explicit and implicit), language proficiency (English/ Arabic), and paranoia in Emirati females	Cross sectional study	United Arab Emirates	Emirati college women (N = 208); Age groups: 19 to 37 years.	Risk factors Ethnic identity may play a significant role in the development of paranoia. In-group language proficiency (Arabic) is negatively associated with paranoia. Implicit out-group preference (American) was related with more paranoia.	

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Lemsalu L, Rützel K, Laisaar KT, Löhmus U, Raidvee A, Raiküla A, HIV-BRIDGE Study Group. [145]	2017	New York University Abu Dhabi, Abu Dhabi, United Arab Emirates.	Suicidal Behavior Among People Living with HIV (PLHIV) in Medical Care in Estonia and Factors Associated with Receiving Psychological Treatment.	To assess the suicidal behaviour (ideation and/or attempts, ever and in the past 12 months) among PLHIV receiving outpatient HIV medical care in Estonia and associations between suicidal behaviour and psychological treatment.	Cross-sectional study	Abu Dhabi, United Arab Emirates.	Eight hundred PLHIV participated, 39% (n = 306) of whom had been suicidal.	Individuals perceiving a need for treatment were significantly more likely to receive psychological treatment when experiencing suicidal behaviour (OR 25.65, 95% CI 2.92-225.47). In conclusion, suicidal behaviour is frequent among PLHIV, but psychological treatment is not often received. One of the barriers to treatment is patients' lack of perceived need for help.	
Amiri L, Voracek M, Yousef S, Galadari A, Yammahi S, Sadeghi MR, Eskin M, Dervic K. [146]	2013	United Arab Emirates University, Al Ain, UAE.	Suicidal behaviour and attitudes among medical students in the United Arab Emirates.	To investigate suicidal behaviour and attitudes among medical students in the United Arab Emirates (UAE).	Cross-sectional study	United Arab Emirates (UAE).	115 medical students (mean age 20.7 years, 59.1% female)	The prevalence of suicidal ideation and attempts among medical students in the UAE was in the lower range during international comparison. Negative attitudes toward suicide were accompanied by a strong support for a suicidal friend, and both were related to religiosity.	
Hamdan A. [147]	2009	University of Sharjah, Sharjah, United Arab Emirates.	Mental health needs of Arab women.	This study highlighted the research on the mental health needs of Arab women.	Review	UAE	Arab women.	The study warranted future research to close the gap between the needs and the services available.	
El-Rufaie OE, Al-Sabosy MA, Bener A, Abuzeid MS. [148]	1999	Department of Psychiatry, Faculty of Medicine, UAE University, Al Ain, United Arab Emirates.	Somatized mental disorder among primary care Arab patients: I. Prevalence and clinical and sociodemographic characteristics.	To estimate the prevalence of somatized mental disorder (SMD) in comparison to psychologized mental disorder (PMD) among a sample of primary health care (PHC) Arab patients	Cross-sectional study using the 12-item General Health Questionnaire (GHQ-12) and Clinical Interview Schedule	Al Ain United Arab Emirates (UAE).	10 psychiatric patients were mixed anxiety and depressive disorder, generalize anxiety disorder	The SMD estimated prevalence rate was 12%. SMD patients constituted 48% of the psychiatric patients identified. This figure for the PMD group was 42%. Educational level was significantly lower in the SMD group. Backache, headache, and abdominal pain were the most commonly presented somatic symptoms.	

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Daradkeh TK, Ghubash R, el-Rufaie OE, Abou-Saleh MT. [149]	1999	UAE University, Al Ain.	The rationale, development and reliability of a new screening psychiatric instrument	To describes the rationale, development, reliability and validity of a new screening psychiatric instrument.	Interview + Cross sectional GHQ-12.	United Arab Emirates (UAE).	22 with psychopathology and 23 without. General Health Questionnaire (GHQ) was administered to n = 365	The new instrument correctly classified 89% of subjects into cases and non-cases. The instrument is, therefore, highly reliable and valid screening instrument.	
Ghubash R, Abou-Saleh MT, Daradkeh TK [150]	1997	, United Arab Emirates University, Al Ain, United Arab Emirates.	The validity of the Arabic Edinburgh Postnatal Depression Scale.	To assess postpartum women at 1 week postpartum with the (EPDS) and at 8 +/- 2 weeks postpartum using the Present State Examination (PSE).	Cross-Sectional	Al Ain United Arab Emirates (UAE).	A consecutive sample of 95 postpartum women	The Arabic version of the EPDS is a valid and reliable screening tool for depression in postpartum women.	
Ghubash R, Abou-Saleh MT. [151]	1997	United Arab Emirates University, Al Ain, United Arab Emirates.	Postpartum psychiatric illness in Arab culture: prevalence and psychosocial correlates.	To assess in the postpartum period using clinical and socio-cultural instruments	Cross sectional study	New Dubai Hospital in Dubai, United Arab Emirates	Ninety-five women	The prevalence rates of postpartum psychiatric morbidity and its risk factors in this Arab culture are similar to the results obtained in numerous previous studies in industrialised countries. These findings have implications for the early detection and care of women at risk for postpartum depression	
Ghubash R1, Hamdi E, Bebbington P. [152]	1992	UAE University Medical School, Al Ain.	The Dubai Community Psychiatric Survey: I. Prevalence and socio-demographic correlates.	To describes the methods and initial findings of the first community psychiatric survey from an Arabian country.	Survey	Seven United Arab Emirates	7 women	Prevalence may be related to the rapid sociocultural change in this society. Future reports will examine the influence of sociocultural change at an individual level.	

General Research Papers on Mental Disorders									
Author/Ref	Year	UAE institution affiliation	Title	Aim	Study design	Settings	Study population	Key findings	
Khamis V. [153]	2007	United Arab Emirates University, Al Ain, Abu Dhabi, UAE. vkhamis@uaeu.ac.ae <vkhamis@uaeu.ac.ae>	Psychological distress among parents of children with mental retardation in the United Arab Emirates.	to identify predictors of parental stress and psychological distress among parents of children with mental retardation in the United Arab Emirates	Interview	United Arab Emirates University, Al Ain, Abu Dhabi, UAE	parents of 225 mentally retarded children	An orientation toward recreational and religious pursuits, high independence, and intellectual and recreational orientations were associated with lower levels of parental stress. On the other hand, parents in achievement-oriented families showed elevated levels of parental stress. Implications for prevention, and intervention as well as parent training and system-oriented counselling programs are discussed.	
Daradkeh T1, El-Rufaie O, Younis Y, Ghubash R. [154]	1997	Department of Psychiatry and Behavioural Sciences, UAE University, PO Box 17666 Al Ain, United Arab Emirates.	The diagnostic stability of ICD-10 psychiatric diagnoses in clinical practice.	To examine the stability of ICD-10 diagnoses of patients admitted to Al Ain (United Arab Emirates) inpatient psychiatric unit during the period from November 1993 to August 1995	Quantitative	Al Ain (United Arab Emirates)	One hundred and seven patients were admitted more than once during this period	Poor levels of stability were also found for other psychoses (excluding schizophrenia and affective psychoses) and personality disorders. We conclude that the introduction of ICD-10 as a formal diagnostic system has greatly improved the temporal stability of the most commonly encountered psychiatric disorders (ICD-10 F1 to F3 disorders), confirming the construct validity of those psychiatric disorders. Further investigations are required to evaluate the diagnostic stability of neurotic and other psychotic disorders.	
El-Rufaie EF, Al-Sabosy M, Abuzeid MS, Ghubash R. [155]	2002	UAE University, Al Ain, United Arab Emirates.	Personality profile among primary care patients: experimenting with the Arabic IPDE ICD-10.	To estimate the prevalence of personality disorder (PD) among primary health care (PHC) patients, and to investigate the characteristic features of the International Personality Disorder Examination, the ICD-10 module (IPDE ICD-10).	Interview	Al Ain, United Arab Emirates	A sample of 158 PHC patients in Al Ain, United Arab Emirates (UAE), were interviewed by general practitioners (GPs) using the Arabic version of the IPDE ICD-10	The IPDE-ICD-10 is useful but relatively time consuming with repetition and need rephrasing in some items. Dimensional measurement proved essential.	

Unpublished Research

Mohammed Allam, a fellow of the Royal Australian and New Zealand College of Psychiatrists aims to examine the potential value of early long-term use of Memantine to delay the development of Alzheimer's disease in genetically loaded high risk individuals.

Dr. Hawraa Sajwani and colleagues from Behavioural Sciences Institute, Al Ain Hospital; Al Ain - United Arab Emirates conducted a research to study the challenges of providing care to female Ethiopian patients across mental health settings in the United Arab Emirates. The study aimed to obtain a broader perspective of the demographics of these patients, explore the circumstances, and different presentations reported, accompanied by the diagnoses, treatment and management modalities received for the same. Electronic charts of the 65 Ethiopian female patients were reviewed, who were admitted to the psychiatric inpatient units at the Behavioural Sciences Institute (BSI) situated in Al Ain Hospital (AAH) over a one-year period from 1st August 2011 to 31st July 2012. Analysis was carried out using SPSS software. The mean and standard deviation were calculated for the continuous variables and Chi-square test was used to analyse statistical significance in the categorical variables. The results suggest that a higher percentage of the patients experienced language barrier, while others were restrained physically at some point in time. Poor communication and vast cultural differences between the patients and health staff for this specific group levied a great challenge in the care provided to them. Additional studies are warranted in future to permit an improved understanding of their belief systems and their cultural norms, to tune services across the facilities to meet the expectations and needs of this group.

Authors: Hawraa Sajwani, Jamila Al Ketbi, Yahya Al Takriti, Abdullah Hasan, Karim Abdel Aziz, Dina Aly El-Gabry, Mouza Al Sabousi, Ghanem Al Hassani, Mohamed Hashim Elamin

ADHD Studies: The Ministry of Health and Prevention (MOHAP) successfully launched the new research agenda for 2018-2019, which is aimed towards studying attention deficit and hyperactivity disorder (ADHD). The new agenda, which follows the government's directives to create key research and establish an innovative system for mental health, falls in line with the national policy activities aimed at promoting mental health in the UAE. One of the research articles reinforces the role of educators in schools in supporting psychiatrists in their move to identify symptoms of ADHD. While, another study aims to conduct a comprehensive review of local and international clinical guidelines on ADHD that contribute to the accurate diagnosis of the disorder.

HIGHLIGHTS OF HIGH IMPACT RESEARCH ARTICLES

The role of pterins in depression and the effects of anti-depressive therapy

A case control study was published by Abou-Saleh et al. (1995) in Al Ain, UAE to examine the role of pterins in depression and the effects of anti-depressive therapy. Urinary excretion of biopterins (B) as well as neopterin (N) was measured by recruiting 48 patients with depression before and after treatment with placebo, electroconvulsive therapy (ECT), or antidepressants and in 26 healthy control subjects. The findings of the study demonstrated that a significant correlation between N:B ratios, severity of depression and plasma cortisol. Since, the raise in N:B ratio infers failure to convert neopterin to biopterin, it is possible that reduced availability of tetrahydrobiopterin, the essential cofactor for the serotonin, noradrenaline, and dopamine formation, may exert rate-limiting control over the monoamines synthesis which was implicated in the depressive illness pathogenesis.

De novo and inherited TCF20 pathogenic variants are associated with intellectual disability, dysmorphic features, hypotonia, and neurological impairments with similarities to Smith-Magenis syndrome

Vetrini et al. (2019) conducted a clinical or molecular analysis to determine the inheritance of the pathogenic variant alleles and to study the spectrum of the phenotypes. The author indicated that Neurodevelopmental disorders are phenotypically and genetically heterogeneous encompassing intellectual disability (ID), developmental delay (DD), autism spectrum disorders (ASDs), structural brain abnormalities, and neurological manifestations with variants in a large number of genes (hundreds) associated. To date, a few de novo mutations potentially disrupting TCF20 function in patients with ASD, ID, and hypotonia have been reported. Around 32 patients and 4 affected parents from 31 unrelated families were recruited in the study. A genome-wide analyses by chromosomal microarray analysis (CMA) and exome sequencing (ES) was performed that identified individuals with heterozygous, likely damaging, loss-of-function alleles in TCF20. The results of this showed 25 unique inactivating single nucleotide variants/indels (1 missense, 1 canonical splice-site variant, 18 frameshifts, and 5 nonsense) and 4 deletions of TCF20. TCF20 pathogenic variants were also associated with a novel syndrome manifesting clinical characteristics like those observed in Smith-Magenis syndrome.

Neuronal correlates of depression

Chaudhury et al., (2015) from New York University Abu Dhabi (NYUAD), conducted a review to define the

molecular changes associated with depression followed by neurogenesis and genetic modifications leading to structural modifications associated with depression-related synaptic plasticity. The study synthesized the findings from rodent studies through which emerged a role for different, yet consistent, molecular systems and related neural circuits to the depression etiology.

Postpartum psychiatric illness in Arab culture: prevalence and psychosocial correlates

Ghubash and Abou-Saleh et al. (1997) conducted a cross-sectional study to assess 95 women admitted for childbirth to the New Dubai Hospital in Dubai, United Arab Emirates. These subjects were assessed in their post-partum period, using different clinical and socio-cultural instruments such as Self-Report Questionnaire (SRQ) at day 2, the Edinburgh Postnatal Depression Scale (EPDS) at day 7, and the Present State Examination (PSE) at week 8 +/- 2 and week 30 +/- 2 after delivery. The study findings suggested that prevalence rate of psychiatric morbidity was 24.5% by the SRQ, 17.8% by the EPDS, and 15.8% by the PSE. These findings showed implications for the early detection and care of women at risk for postpartum depression.

Prevalence of tics and Tourette syndrome in an inpatient adult psychiatry setting

Eapen, and colleagues (2001) conducted a cross-sectional study to evaluate the prevalence of TS or tics in a psychiatric inpatient population. About 200 consecutive adult patients were recruited for this study. None of the 200 patients had definite TS, 10 had a history of tics (present for less than a year), 2 were observed to have motor tics; and 7 reported a family history of tics. Thus, 19 (9.5%) inpatients qualified for inclusion in a broadly defined TS diathesis. These rates are significantly lower than those reported in a similar community based epidemiological study of adolescents ($p = 0.018$). The findings suggest that TS and related behaviours are over-represented among adult inpatients with psychiatric illnesses.

The primary care anxiety and depression (PCAD) scale: a culture-oriented screening scale

El-Rufaie (1997) conducted a cross sectional study using Self-Reporting Questionnaire (SRQ-20) and the Hospital Anxiety and Depression (HAD) scale to address the construction of a screening scale for states of anxiety and depression among primary health care. The scale correlated more strongly with the psychiatrist's clinical judgement than the general practitioners' assessments. Two cut-off points were established, one of which is more appropriate for clinical use and the other for prevalence estimation. The former threshold of the scale could be used to alert the busy general practitioner to the possibility that clinically significant anxiety or depression may be present.

Performance of the Hamilton Depression Rating Scale in depressed patients in the United Arab Emirates

Hamdi et al (2019), conducted a validity and reliability analysis to evaluate the face validity of the Hamilton's Depression Rating Scale (HDRS-21) scale by studying the mode of expression, factor structure and frequencies of depressive symptoms in 100 UAE depressed patients. This study showed that the scale HDRS is sensitive to severity of depression in the UAE culture. However, it measures heterogeneous aspects, and its internal consistency suffers as a result. High levels of somatization and retardation contribute significantly to the total score in socially developing communities.

The prevalence of early postpartum psychiatric morbidity in Dubai: a transcultural perspective

Abou-Saleh and Ghubash et al., (1997) conducted a cross sectional study to determine the prevalence of early postpartum psychiatric morbidity in Dubai. Around 95 women admitted for childbirth to New Dubai Hospital in Dubai, United Arab Emirates were recruited in the study. Findings suggested that the prevalence of psychiatric morbidity was 24% according to the SRQ and 18% according to the EPDS.

Personality profile among primary care patients: experimenting with the Arabic IPDE ICD-10

El-Rufaie et al, (2002) conducted an interview study to determine the features characteristic of the International Personality Disorder Examination, the ICD-10 module (IPDE ICD-10) and to determine the prevalence of personality disorder (PD) among primary health care (PHC) patients. The authors recruited a sample of 158 PHC patients in Al Ain, United Arab Emirates (UAE). The interviewed patients included 76 females and 82 males. The study identified the Definite PD in around 12.7%. The rates of prevalence in females and in males was 15.8% and 9.8% consecutively. Some of the common personality disorders were the anankastic (4.4%), schizoid (5.1%), and the emotionally unstable, borderline type (3.8%). The mean dimensional scores of probable and definite PD patients was 4.3 and 5.6 consecutively.

A prospective case control study of psychiatric disorders in adults with epilepsy and intellectual disability

Turky et al., (2011) conducted a case control study to determine the impact of epilepsy on psychiatric disorders among adults with an intellectual disability (ID). Some of the psychiatric symptoms were prospectively measured over a period of one year among 45 adults with intellectual disability without epilepsy, and 45 adults with ID and

active epilepsy. These findings point to an amplified risk of depression and unspecified disorders, including dementia, among adults with epilepsy and ID. Comparison of the psychiatric scores showed the epilepsy group had significantly higher unspecified disorder and depression symptom scores.

The role of pterins and related factors in the biology of early postpartum depression

Abou-Saleh et al. (1997) conducted a study to measure neopterin (N), urinary biopterin (B), folate and vitamin B12, cortisol, Plasma tryptophan and putative amino acids in three groups of women, including 38 non-gravid controls, 23 pregnant and 62 women in the early postpartum period. The results showed a significant contribution for low tryptophan to increased EPDS. This also demonstrated significant correlations with low tyrosine, low methionine, low N:B ratio and high vitamin B12.

Semantic word category processing in semantic dementia and posterior cortical atrophy

Shebani et al. (2016) hypothesized the areas of principal brain atrophy in the two patient groups. The prevalence of these regions to different types of word processing and semantic information was also determined. This study mainly investigated word processing in two groups of patients whose neurodegenerative diseases preferentially affect certain brain parts, to determine whether their performance would differ as a function of semantic categories proposed to recruit those regions in the brain. The patterns of performance on the lexical decision task demonstrated (a) general lexicosemantic processing deficits in both groups, though more prominent in SD than in

PCA, and (b) differential involvement of anterior-temporal and posterior-parietal cortex in the processing of specific semantic categories of words.

Central monoamines and their role in major depression

Elhwuegi et al, (2004) studied the role of central monoamines in major depression. The results indicated that blocking the somato-dendritic 5-HT(1A) or nerve terminal alpha (2) receptors proved to increase the response rate in the treatment. This super sensitivity might play a role in the mechanisms underlying antidepressant induced mood switch and rapid cycling.

Viral-mediated knockdown of mGluR7 in the nucleus accumbens mediates excessive alcohol drinking and increased ethanol-elicited conditioned place preference in rats

Bahi (2013) examined the contribution of mGluR7 on the effect of ethanol within the nucleus accumbens (NAcc), a neural target for many drugs of abuse. The study used short hairpin RNA (shRNA)-expressing lentiviral vectors (LV) to alter locally the activity of mGluR7 in male rats. Hence, the blocking of mGluR7 expression amplified the consumption and preference of ethanol in a two-bottle choice drinking paradigm with no effect either on saccharin or on quinine used for taste discrimination. Thus, the findings demonstrated that the levels of mGluR7 in the NAcc regulates responsiveness to alcohol. Henceforth, the mGluR7 signalling within the NAcc is a key modulator of functional responses to ethanol that provides an important target for regulating the addictive alcohol effects.

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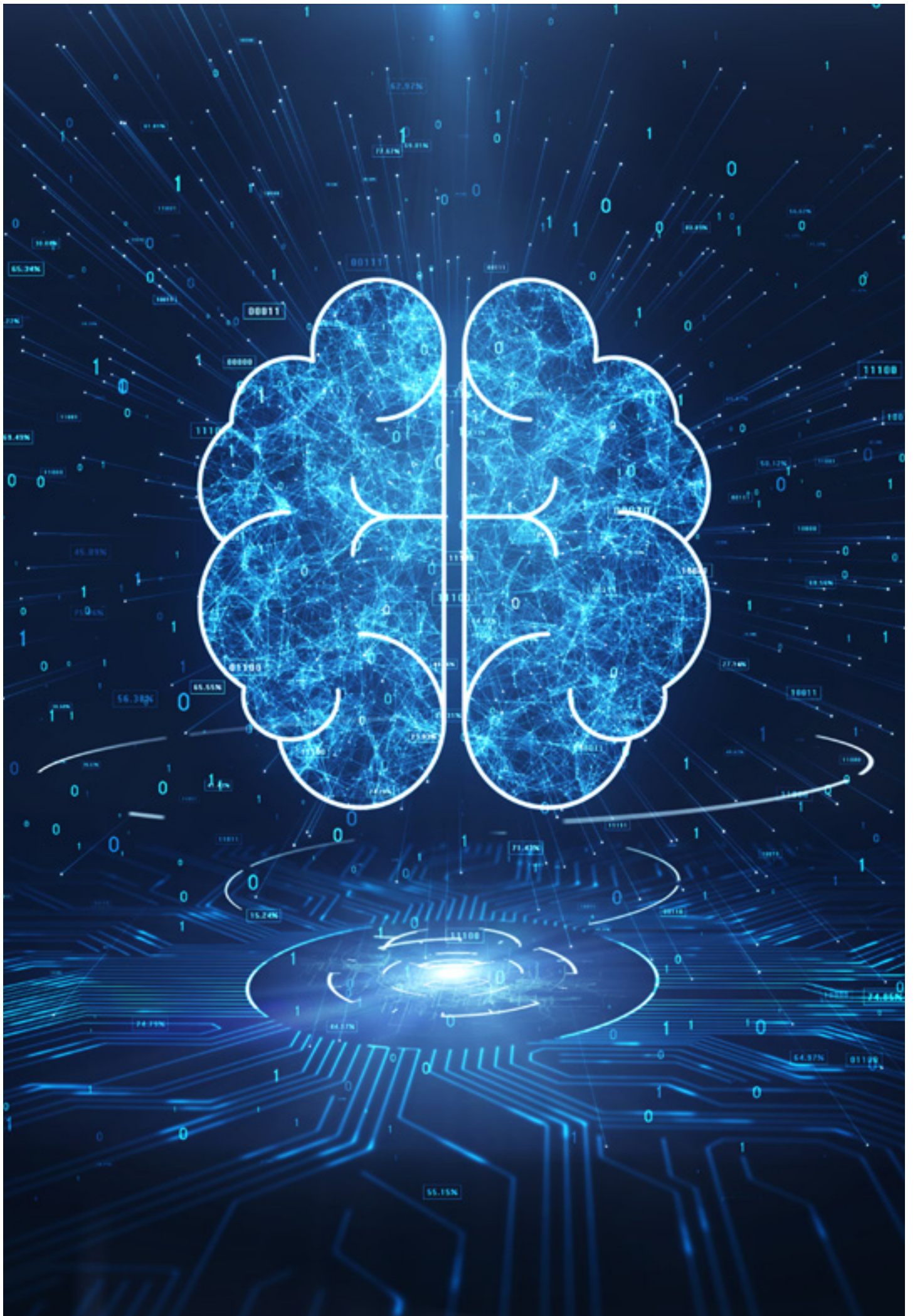
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155. El-Rufaie OE, Al-Sabosy M, Abuzeid MS, Ghubash R. Personality profile among primary care patients: experimenting with the Arabic IPDE ICD-10. *Acta psychiatrica scandinavica*. 2002 Jan;105(1):37-41.



6. Scientific Research Output on Mental and Behavioural Disorders

Bibliometric analysis has been widely used to assess research productivity and growth in the health sciences. Bibliometrics is used in research performance evaluation, especially in university and government labs, and also by policymakers, research directors, administrators, information specialists, librarians, and researchers themselves. To track research output, we conducted a statistical analysis of mental health research outputs from the past decade. This section describes results of mental health research articles published between 1992 and January 2019. Overall, 153 papers on mental health from United Arab Emirates institutions, were extracted from research bank, PubMed and other databases. The data can therefore be used for evaluation of research, motivate researchers, or allocation of research funds in mental health field. The publications were coded according to: year of publication, top eight journals, topics covered, author’s affiliation, impact factor analysis, study design, top 5 institutions, and most active authors in the field.

Overall mental health research publications outputs

Overall, there has been an increase in publication outputs in 2013 from the previous years. Figure 4 shows the progressive distribution of the 153 research articles on mental and behavioural disorders. Results revealed different growth periods of articles over the past 27 years. There were only 69 research papers related to mental health prior to 2013. However, after 2013, the cumulative number of mental health researches increased dramatically. Thus, the research performance has also improved.

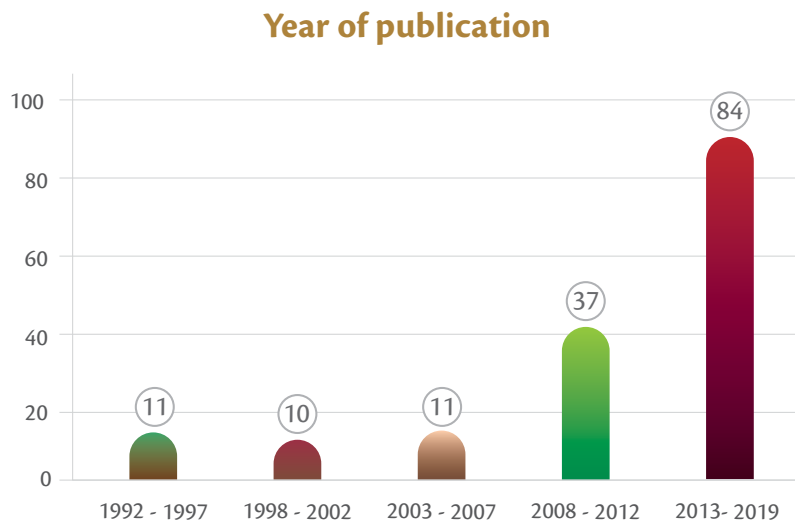


Figure 4: Overall UAE Mental Health Research Publications Outputs by year, 1992 -2019

Proportion of mental health research publications outputs by topic, 1992 -2019

The topics covered by the ‘specific’ publications were diverse and the pattern still continues. Most articles addressed particular mental disorders. The analysis showed that the vast majority of the research papers retrieved were on Substance abuse (33; 21.5%) and Depression (24; 15.6%). The retrieved literature in mental health research also included 22 general papers about mental health, 14 (9.2%) articles on anxiety, 10 (6.5%) articles on anxiety and depression in combination, 9 (5.8%) on Bipolar affective disorders, and 8 (5.2%) articles on Intellectual disability over the specified period.

Topics of Research

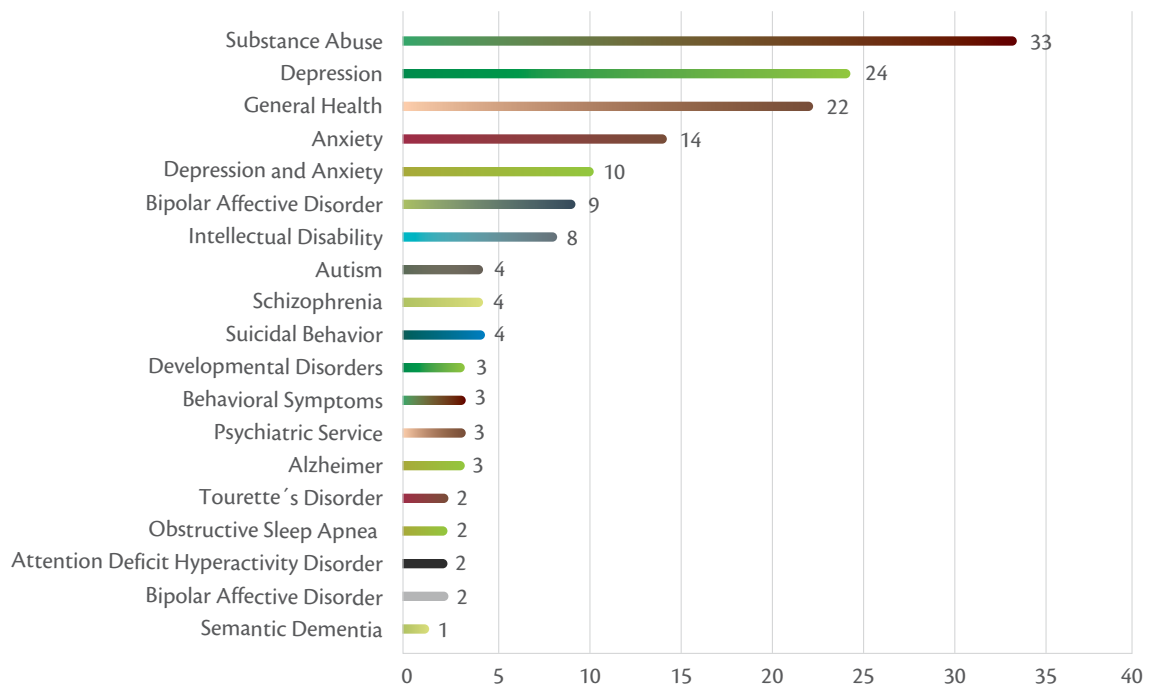


Figure 5: UAE Mental Health Research Publications Outputs by Topic, 1992 -2019

Number of Mental Health Research published categorised by the type of study design, 1992 -2019

Majority of the research publications in mental health included the use of cross-sectional studies (62; 40%) followed by experimental studies (31; 20%), 11 (7%) qualitative interviews, 10 (6.5%) general reviews, and 5.8% of the randomized controlled trials.

Study Design

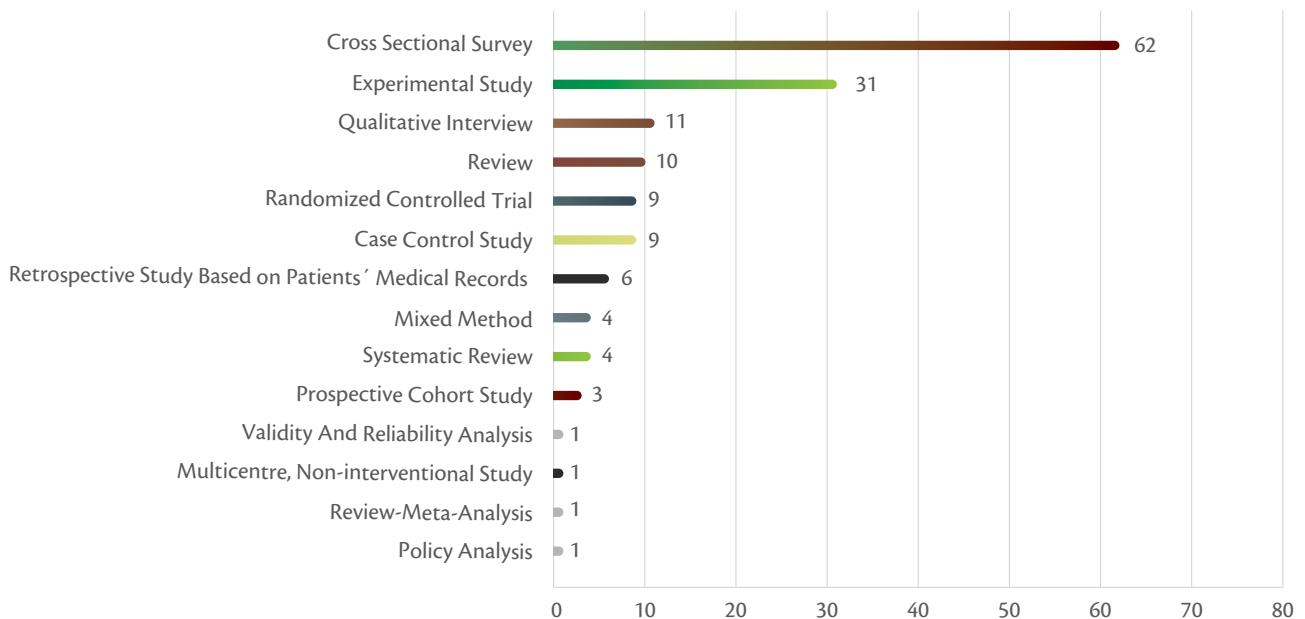


Figure 6: Mental Health Research Publications Outputs by Research Design, 1992 -2019

Top 5 institutions that published articles on Mental Health in UAE, 1992 -2019

Ranking institutions in terms of paper counts helps to compare the productivity and volume of research output among various institutions. The number of researchers at an institution should be taken into account when comparing the count of publication across institutions. The UAE university, University of Sharjah, Zayed University, Gulf medical University, Ajman, and Sheikh Khalifa Medical City, Abu-Dhabi were among the top five most active and productive institution in the United Arab Emirates in terms of publishing mental health research articles from 1992 – 2019 (Fig 7). UAE University had the highest number of mental health research articles (56.67%) within the study period.

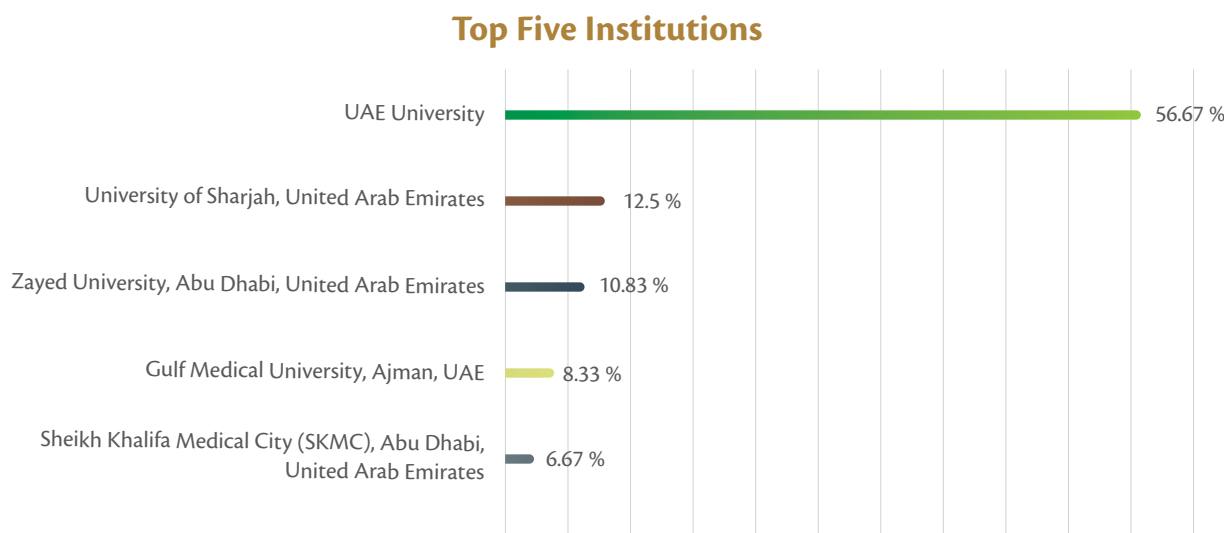


Figure 7: Mental Health Research Publications Outputs by Institution, 1992 -2019

Top 15 Active authors in the field of mental health research in UAE, 1992 - 2019

The total number of authors who took part in publishing retrieved research manuscripts on mental health from UAE were 484. Single–authored publications constituted approximately 25.9% of retrieved documents while the remaining were multi-authored (≥ 2 author publications).

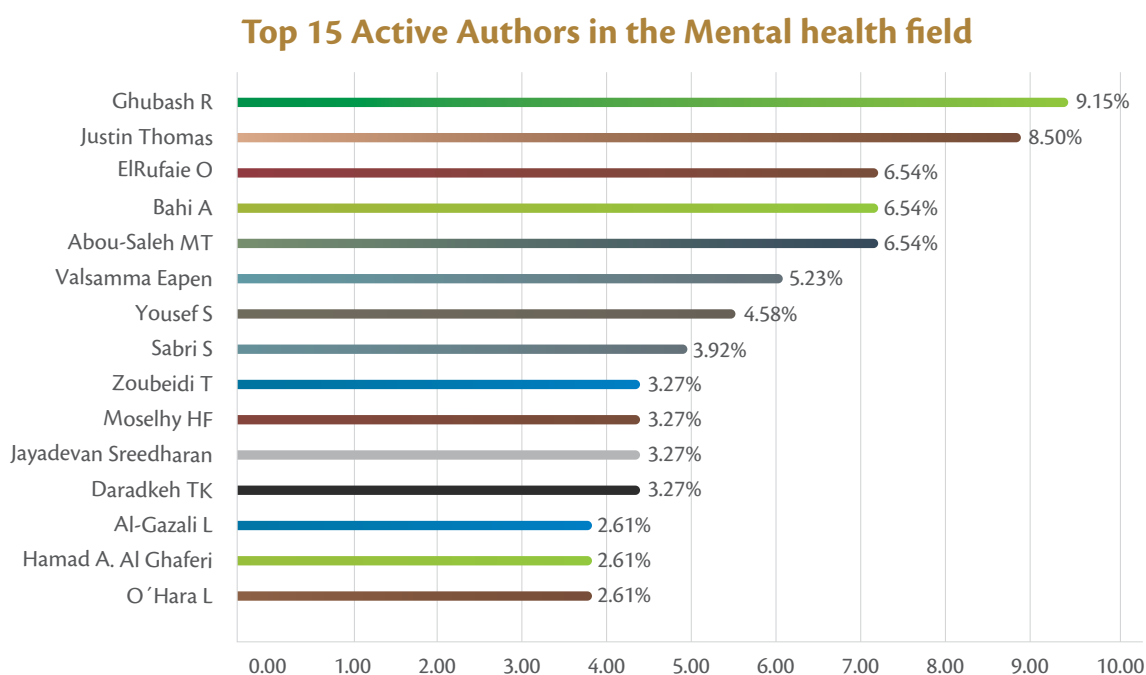


Figure 8: Top fifteen active authors in the field of mental health research in UAE, 1992 -2019

The top fifteen active authors in the field of mental health are shown in Figure 8. The top fifteen list of active authors included eleven authors from UAE University, Al Ain, one author from Abu Dhabi University, one from National Rehabilitation Centre, Abu Dhabi, one from Gulf Medical University, Ajman, and one from Zayed University, United Arab Emirates.

Impact factor analysis of the Mental Health Research output from United Arab Emirates, 1992 -2019

Journal impact factor is a measurement applied to the journals. The impact factor of a journal represents the average citation count of the articles published in the journal during a two-year period. Majority of the mental health research publications had an impact factor between 0 - 2 (51%). Only 2.6% of the research paper published paper in the journals had an impact factor of more than 6.

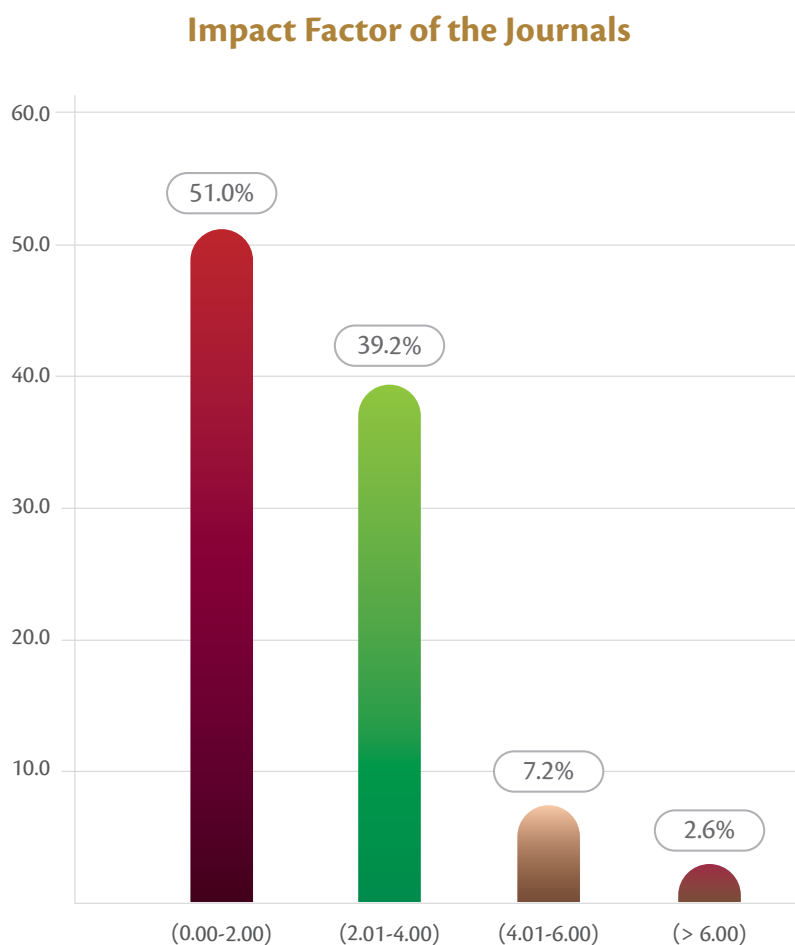


Figure 9: Mental health research publications outputs by Impact factor of the Journals, 1992 -2019

Top 8 journals that published articles on Mental Health, 1992 -2019

Figure 10 shows the names of journals in which the extracted mental health research paper appeared repetitively along with the number of research paper published by the specific journal. The retrieved mental health research paper were published in 115 different peer-reviewed journals. The top eight preferred journals for publications in the field of mental health in UAE were Asian Pacific Journal of Cancer Prevention (IF 1.5; published 5 articles), Acta Psychiatrica Scandinavica (IF 5.605; published 4 articles), Psychological Reports (IF 0.667; published 4 articles), Journal of Affective Disorders (IF 4.084; published 3 articles), followed by Appetite, Social Psychiatry and Psychiatric Epidemiology, International Journal of Geriatric Psychiatry, and International Journal of Social Psychiatry publishing three articles each.

Top Eight Journals

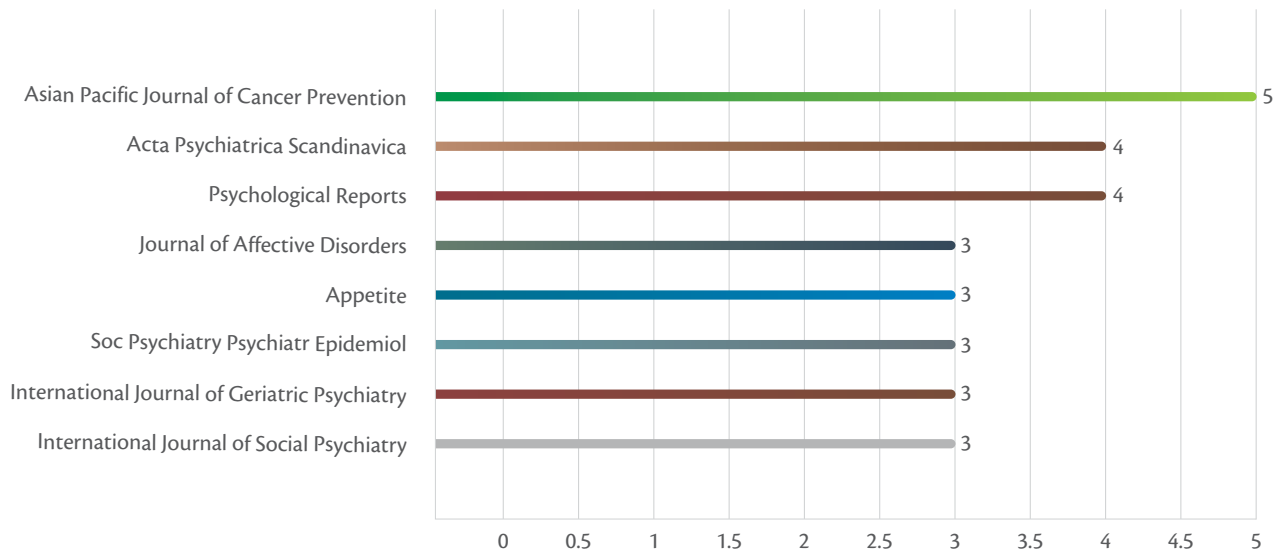


Figure 10: Top Eight Journals publishing mental health research papers in UAE, 1992 -2019

Summary

This section aims to identify number of publications in Mental Health field in the United Arab Emirate cited in PubMed, Research bank and some other databases from 1992 to January 2019. The total number of mental health papers published over the past 27 years is 153. The most dynamic fields of mental health research included substance abuse and depression. This is the first analysis of the peer-reviewed literature in mental health studies pertaining to UAE. The findings of this report will be useful for funding agencies, health authorities, and other agencies interested in mapping the health research domains and will identify the gaps within the landscape of mental health research. This also seeks to set global action plans on mental health to account for gaps in evidence-base to advance the research agenda.



7. CONCLUSION

Mental and behavioural disorders account for a substantial proportion of the global disease burden. The evidence suggests an emerging recognition that good mental health is central to the quality of life for people, their families, to the economic and social success of society and to the UAE. Under the leadership of the Ministry of Health and Prevention, key stakeholders are in line to develop a strategy to reform the mental health system, with a common vision of providing the best possible integrated mental health services for the people of UAE while changing attitudes and tackling stigma towards mental illness. Stigma is known for aggravating the vicious cycle of illness and social negative reaction and leads to discrimination and social exclusion. UAE vision reflects the importance attached to mental health issues in the country. Considering mental health, a national health priority is a noteworthy step taken to realise the potential gains associated with high spending on mental health.

Much progress has been achieved by the United Arab Emirates, however, there is still a long way to go. Decision makers, leaders, relatives, patients, professionals, and civil societies are working collaboratively towards achieving the shared vision, where UAE citizens can experience good mental health and well-being, mainly supported by integrated mental health services. Undoubtedly, the country will achieve its vision of less stigma for those seeking assistance and their access to effectual treatment and care in suitable settings. Action plans are being formulated for preventing mental and behavioural disorders based on resource capacity, local feedback, and international best practices. UAE Government is also in line to ensure that relevant agencies are aware of the significance of mental health and are aware of the influences that their activities can have on mental health ensuring that proper co-ordination between relevant agencies takes place. The government is also focusing on adolescent and child mental health promotions through schools, further integration into primary care. Government is effectively ensuring availability of mental health service for specialized populations. UAE government is effectively promoting wellbeing concepts and practices in the workplace and facilitates the implementation of the National Agenda for Wellbeing. Additional research and evaluation are underway to support practice decision making and policies.

Alongside government efforts, several private foundations, educational institutions, and NGO's have collaboratively worked on researches to generate public awareness and disseminate mental health information. Quantitative baseline population surveys and qualitative research focus groups are conducted to investigate the attitudes

at local level, and awareness of stigma for supporting the development of effectual programs and campaigns. UAE successfully adopts best practices from abroad and adapts them for local use. Some of the mental health challenges includes expansion of existing psychiatric healthcare services and adequately addressing stigma surrounding mental illness to develop a society that efficiently accepts mental conditions in general. Government is also keen to ensure that mental health is included in generic health reforms that are occurring, such as health information systems development, quality standards, hospital optimisation programmes, basic training standards, and accreditation procedures. This report provides public health workers, policy makers, planners and health professionals the opportunity to evaluate the burden caused by mental and neurological disorders and to take suitable action. The following recommendations are further required to be implemented across a wide range of disciplines and sectors to achieve success. Moreover, gaps in literature have been identified to accelerate research in this field.

Gaps in Research

To achieve optimal individual outcomes for patients suffering from mental illness and mental health problems is mainly founded on strong evidence base. Furthermore, scientific knowledge of mental illness and mental health are traditionally known to lag behind compared to other health areas. Further understanding of prevalence and incidence of mental illness and mental health issues is needed along with an improved understanding regarding the diverse courses of certain conditions. Additional research with respect to the protective and risk factors for mental illness and mental health issues is needed along with causal pathways through which these factors may be operated. Evaluative evidence on the cost-effectiveness and effectiveness of a diversity of intervention across all mental health services should be a priority specifically provided the expanded focus on the intersectoral care and innovative models.

There are several gaps with respect to mental health in the UAE. Gaps include contradictory discoveries and limited attention on the self-management of mental illness outside the hospital settings, limited baseline studies to support policy development, lack of knowledge about what mental health care really means, research into mental health of children, overcoming the stigma of mental illness, prevention and treatment researches on the topic discussed above including suicide and self-harm, health services and implementation research areas should be focused that aligns well with efforts to close treatment gaps, epidemiological studies conducted on several different disorders such as Delusional disorders, Amnesic disorder,

mood [affective] disorders, Dissociative and conversion disorders, Somatoform disorders, Gender identity disorders, Paraphilias, disorders of adult personality and behaviour and other developmental disorders. The full extent of adverse mental health and social impacts of substance-use disorders such as alcohol use during pregnancy and fetal alcohol spectrum disorders remain incompletely understood. Priorities should begin with exploration of knowledge and experience of people with mental health problems. Moreover, it is important that a wide range of stakeholders should identify gaps in research and set priorities in mental health research.

The Way Forward

Implementation of Policies

In UAE, Psychiatrists are expected to play a key role in prompting policy makers to develop well-tailored mental health policies, boost the priority afforded to mental health, as well as support fine tuning, and implementation. Other policy recommendation includes laws and regulations to restrict access to the means of suicide or self-harm. Child protection laws improved perinatal or obstetric care to prevent birth trauma, given its association with physical and mental disabilities, notably epilepsy and improved control of neurocysticercosis are recommended as good practice, given the emerging evidence of their health and safety benefits.

Health Promotion

Professional and public awareness of these disorders is being raised through local and global initiatives and campaigns mainly targeting the neurologists, general practitioners, specialists in public health, psychiatrist, media, health economists, health planners, and general population. Training are also being enhanced by continuing education in management, diagnosis, assessment, and referral criteria, utilizing guidelines and strengthening basic training. Basic training and educational interventions for caregivers, patient information programmes, and self-help groups are to be facilitated and encouraged. Plans are in line to fully involve carers, families, and patients. They will be represented in the implementation and development of services, and policies for people with mental and neurological disorders.

Good Practice Interventions

Community Interventions:

Mental health promotion should integrate occupational health and safety policies. Workplace strategies such as alcohol and drug misuse awareness and stress reduction need to be targeted.

School Based Interventions:

Universal and targeted School-Based Social and Emotional Learning (SEL) programs for vulnerable

children need to be strengthened. This includes case detection and identification of MND disorder in school and awareness programs. Educational strategies are in line to build teachers' capacity to identify students with possible mental health problems and subsequently make appropriate referrals.

Community Groups and Neighbourhood:

Other programs include parenting programs during infancy, preschool educational programs and early childhood enrichment, parenting programs for children aged 2–14 years, gate keepers training including social workers, police and community health workers to identify MND disorders encircling self-harm. Also, promote folic acid food fortification and selective protein supplementation programs to promote healthy cognitive development.

Surveillance

Epidemiology is essential for overall mental health policy goals. Policies usually takes account of epidemiology of disorders (including duration, frequency, severity and range), mortality, associated social disability, and association to sociodemographic variables, such as geographic variation. Decision makers are in line to provide solid knowledge about the consequence, prevalence, and burden of mental and neurological disorders. Promising and proven interventions will be documented carefully leading to management and prevention.

To build alliances between different stakeholders, communication techniques such as media is being used for better engagement and identification of community leaders. Some of the common mental health policy aims include reduction of prevalence and incidence (treatment or prevention), mental health promotion, reduction of the severity and extent of the associated disability (rehabilitation), reduction of stigma, promoting dignity and human rights of mentally ill people, reducing mortality associated with mental illness such as premature physical mortality and suicide. More local and national epidemiological knowledge and health information systems development are needed to build capacity in local epidemiology.

Need for Locally Tailored Solutions

In comparison to strategy formulation, implementation is considerably more challenging. Specific attention needs to be paid to resources (sponsorship and aid, maximising the utilization of generic budgets, ensuring revenue flows, and accessing key budgets); communications (alliance building between key partners, organising feedback, cascading evidence within institutions and public relations about the strategy); staff (basic or continuing education for mental health staff, re-skilling for varying service configurations, planning the development of the human resource; skilling generic staff such as teachers, engaging educational

institutions, and professional bodies; and communicating with staff); and establishing the strategy (engaging politicians, managers and generic organizations).

Key Strategies for Strengthening Health System

Some vital strategies required for strengthening health-system include ensuring plans, laws, and health policies are up to date to be consistent with international conventions and human rights standards; incorporate rehabilitation into the key strategies, multi-component initiatives implementation to address stigma, enhancing demands for care and mental health literacy, mobilisation of mentally ill patients to support each other to be efficient advocates, engaging other key sectors that work to improve the services for mentally ill patients, notably private sector, non-governmental organisations, social care, indigenous medical sectors, education, and criminal justice as they all play a complementary role, provision of inpatient care in the form of district and general hospital units rather than stand-alone psychiatric hospitals. Moreover, creating non-specialist cadre for human resources for example, people who are capable to ensure the supply of essential medicines at relevant platforms that can be case managers, coordinate the delivery of collaborative care in different health care platforms and primary care. Mental health community residential facility, forensic inpatient unit, and mental health day care facilities should be developed.

Research Funding

Funding agencies for research have a key role to play for adoption of multi-country strategies, investing effectively in research centres, young researchers, and evaluating preventive interventions, along with acknowledging the complexity of health services research. Long-term commitment from international bodies, and researchers are needed.

Recommendations for Future Research

New medication should be developed with better efficacy, fewer side effects, low cost and less frequent dose schedules. Clinical trials of novel treatments and multicentre epidemiological studies should be additionally facilitated through international collaboration, and multidisciplinary approaches.

ANNEX

Service Providers

Psychiatric hospitals / Primary healthcare centres providing Psychiatric Services in the United Arab Emirates

Names of Hospital
Al Ahli Hospital Company LLC - Branch 1
Medeor 24X7 Hospital - L.L.C.
Mediclinic Hospitals L.L.C. (Al Ain Branch Hospital)
Mediclinic Hospitals L.L.C. (Airport Road Hospital)
Mediclinic Hospitals L.L.C. (Al Noor Hospital)
N M C Royal Hospital L.L.C.
N M C Specialty Hospital - LLC
Specialized Medical Care Hospital
Universal Hospital - Al Ain L.L.C.
Universal Hospital - LLC
Al Ain Hospital
Cleveland Clinic Abu Dhabi LLC
National Rehabilitation Centre
Sheikh Khalifa Medical City
Tawam Hospital
Zayed Military Hospital
Mediclinic City Hospital
Emirates Speciality Hospital
Dr.Sulaiman AL Habib Hospital
Al Jalila Childrens Speciality Hospital
Al Amal Mental health Hospital (MOHAP)
Rashid Hospital (DHA)
Al Musalla Medical Centre (Branch, Al Barshaa)
Amber Clinics LLC
American Centre for Psychiatry and Neurology
Child Learning and Enrichment Medical Centre
Dubai Community Health Centre LLC
Dubai Health Care City
Fly Dubai Clinic
Health Bay Holistic centre [Branch of Health Bay Day Surgery Centre] LLC
Iranian Hospital Dubai

Life Works Holistic Counselling Centre
Mohamed Sameh Psychiatry Clinic L.L.C
Northwest Clinic for Diabetes and Endocrinology
Snowdonia Medical Centre
The Children's Medical Centre LLC Branch
The Hundred Wellness Centre
The Lighthouse Arabia
Obaidullah hospital for senior citizens
Khorfakkan Hospital
Al Kuwait Hospital
Fujairah Hospital
AlQassimi Hospital UAE
Al Qassimi for Women and Children Hospital (AQWCH)
Al Baraha Hospital
Sheikh Khalifa General Hospital Ajman
Int. Specialists Medical Centre, Ajman
Al Elaj Medical Centre, Ajman
Rak Hospital
Sheikh Khalifa Specialty Hospital
Royal Hospital
Al Zahra Pvt. Hospital
Zulekha Hospital
Emirates European Hospital LLC One Day Surgery
Anees Ali Medical Centre LLC
Al Rafidain Medical Centre, Sharjah
Sunny Speciality Medical Centre LLC, Sharjah
Al Shams Medical Diagnostic Centre, Sharjah
Emirates Int. Medical Center, Sharjah
Al Atta International Medical Centre, Sharjah
American Centre for Psychiatry and Neurology LLC
Al Fasht Medical Centre, Sharjah
Psychiatric Clinic, Sharjah
Al Soor Speciality Clinic, Sharjah
Specialized Medical Centre, Sharjah
Alhayat Medical Centre, Sharjah
Ministry of Directorate Medical Services Center, Sharjah

American Center For Psychiatry and Neurology LLC, Sharjah
NAJM Al Raha Medical Center - L.L.C, Sharjah
Murishid primary health care center, Fujairah
Al Hikma Medical Rehabilitation and Physio Therapy, Ras Al Khaimah
Al Weam Well Being Medical Centre, Ras Al Khaimah
Digdagah Health Center UAE, Ras Al Khaimah
Physiotherapy & Sports Medical Centre UAE, Ras Al Khaimah
Al Jazirah Alhamrah Health Center UAE, Ras Al Khaimah

REHABILITATION CENTRE

Names of Hospital [Total=46]	Public/Private
Al Quaa Care and Rehabilitation Centre for people with Special Needs	Rehabilitation Centre for Special Needs
Al Sela' Centre for Care and Rehabilitation for People with Special Needs	Rehabilitation Centre for Special Needs
Ghayathi Care and Rehabilitation Center for people with Special Needs	Rehabilitation Centre for Special Needs
Tawam Rehabilitation Center	Rehabilitation Centre
Al Najah Center For Handicapped Rehabilitation	Rehabilitation Centre for Special Needs
Al Sadara Disabled Care & Rehabilitation Center owned by Mohammed Ghuloum Ali Alkhoori-Sole Proprietorship L.L.C.	Rehabilitation Centre for Special Needs
Al Ain Center for Care & Rehabilitation Disabled	Rehabilitation Centre for Special Needs
Berlin Medical & Neurological Rehabilitation L.L.C.	Rehabilitation Centre for Special Needs
Future Rehabilitation Centre	Rehabilitation Centre for Special Needs
Jordanian Speech Clinic for Speech Therapy and Learning Disabilities L.L.C- Branch 1	Rehabilitation Centre for Special Needs
The New England Centre for Children - Abu Dhabi	Rehabilitation Centre for Special Needs
Al Falah Physiotherapy Centre L.L.C	Rehabilitation Centre
Al Rahma Chinese Medical Natural Treatment Centre	Rehabilitation Centre
Al Twoaili Physiotherapeutical Centre	Rehabilitation Centre
ATRAF Rehabilitation Centre	Rehabilitation Centre
Bedaya Rehabilitation & Training Centre.	Rehabilitation Centre
BounceBack Physiotherapy Treatment Centre L.L.C.	Rehabilitation Centre
Dar Al Rahma Physical Therapy	Rehabilitation Centre
Dr Samir Samy For Japanese Diet Centre L.L.C	Rehabilitation Centre
Emirates Advanced Rehabilitation of Children Centre	Rehabilitation Centre
Emirates and Japanese Diet Centre -L.L.C	Rehabilitation Centre
Homeopathic Medical Specialized Clinic	Rehabilitation Centre
Jordanian Speech Clinic for Speech Therapy and Learning Disabilities (L.L.C)	Rehabilitation Centre
Live'ly LLC Abu-Dhabi	Rehabilitation Centre

Perfect Balance Rehabilitation Centre LLC	Rehabilitation Centre
Point Zero Floatation Center	Rehabilitation Centre
Slim'n Lite Health & Diet Food Center	Rehabilitation Centre
Specialized Chinese Naturopathy Centre	Rehabilitation Centre
VLCC International L.L.C- Branch Abudhabi 3	Rehabilitation Centre
VLCC International LLC - Al Ain Branch	Rehabilitation Centre
VLCC International-LLC Branch Abu-Dhabi	Rehabilitation Centre
YAS Physiotherapy Centre L.L.C	Rehabilitation Centre
Autism Rocks Support Centre FZ-LLC	Rehabilitation Centre
Child Early Intervention Medical Centre FZ-LLC	Rehabilitation Centre
Dr. Majdi El-Halik Paediatric Mental and Physical Rehabilitation Centre FZ-LLC	Rehabilitation Centre
Kids in motion	Rehabilitation Centre
Kids Neuro Clinic and Rehab Centre FZ-LLC	Rehabilitation Centre
American Wellness Centre FZ-LLC	Rehabilitation Centre
Advanced Behavioural Learning Environment FZ-LLC	Rehabilitation Centre
Al Jalila Children's Specialty Hospital	Rehabilitation Centre
Camali Clinic Child and Adult Mental Health FZ-LLC	Rehabilitation Centre
Steppingstone Centre for Autistic Spectrum Disorders FZ-LLC	Rehabilitation Centre
The Doris Duan-Young Autism Centre FZ-LLC	Rehabilitation Centre
DHA-Dubai Rehabilitation Centre (DHA)	Rehabilitation Centre
Abnaouna Speech and Language Treatment Centre	Rehabilitation Centre
Al-We'am Centre for Holistic Therapy, Ras Al Khaimah	Rehabilitation Centre

LIST OF PUBLISHED PAPERS ON MENTAL DISORDERS IN UAE BY TITLE, YEAR OF PUBLICATION, JOURNAL AND IMPACT FACTOR

Serial No.	Year of Publication	Title	Journal	Impact Factor
1	2009	Help-seeking patient's behaviours attending the psychiatric service	International Journal of Social Psychiatry	1.613
2	2009	Referrals to psychiatric service in United Arab Emirates: an analysis of the content of referral letters	International Journal of Health Sciences	0
3	2016	Patient cost-sharing for ambulatory neuropsychiatric services in Abu Dhabi, UAE	International Journal of Mental Health Systems	1.694
4	2012	Psychological health of first-year health professional students in a medical university in the United Arab Emirates	Sultan Qaboos University Medical Journal	0.82
5	2012	Mental health of Dubai medical college students	Iranian Journal of Psychiatry and Behavioural Sciences.	0
6	2010	Troubled minds in the Gulf: mental health research in the United Arab Emirates (1989-2008)	Asia-Pacific Journal of Public Health	1.459
7	2012	The Irrational Beliefs Inventory: psychometric properties and cross-cultural validation of its Arabic version	Psychological Reports	0.667
8	2012	The Mediating Role of Metacognition in the Relationship between Internet Addiction and General Health	Addiction and Health	0.654
9	2016	Integration Between Mental Health-Care Providers and Traditional Spiritual Healers: Contextualising Islam in the Twenty-First Century	Journal of Religion & Health	0.945
10	2015	Does pyridoxine control behavioural symptoms in adult patients treated with levetiracetam?	Epilepsy & Behaviour Case Reports	0
11	2014	Therapeutic relationships from the psychiatric nurses' perspectives: an interpretative phenomenological study.	Perspectives in Psychiatric Care (PPC)	1.015
12	2017	Mental health literacy among paediatric hospital staff in the United Arab Emirates.	BMC Psychiatry.	2.419
13	2017	The mediating effects of coping strategies on the relationship between secondary traumatic stress and burnout in professional caregivers in the UAE	Journal of Mental Health	1.807
14	2009	Mental Health Beliefs Amongst Emirati Female College Students.	Community Mental Health Journal	1.159
15	2017	Ethnic identity and paranoid thinking: Implicit out-group preference and language dominance predict paranoia in Emirati women	Journal of Behaviour Therapy and Experimental Psychiatry	0.93
16	2008	The prevalence and correlates of depressive symptoms among Arab women in a primary health care setting.	International Journal of Psychiatry in Medicine	0.681
17	2009	Cognitive emotions: depression and anxiety in medical students and staff.	Journal of Critical Care	2.191
18	2010	The prevalence and correlates of depression and anxiety in a sample of diabetic patients in Sharjah, United Arab Emirates	BMC Family Practice	2.032
19	2010	Subjective life satisfaction and mental disorders among older adults in UAE in general population.	International Journal of Geriatric Psychiatry	2.419
20	2011	Prevalence of depression and suicidal behaviours among male migrant workers in United Arab Emirates	The Journal of Immigrant and Minority Health	1.284
21	2011	Sunshine, sadness and seasonality: 25-hydroxyvitamin d, and depressive symptoms in the United Arab Emirates (UAE).	International Journal of Mental Health Promotion	0
22	2012	Cognitive vulnerability to depression: an exploration of dysfunctional attitudes and ruminative response styles in the United Arab Emirates	Clinical Psychology & Psychotherapy	2.578
23	2013	Screening and correlates of depression and HbA1c in United Arab Emirates (UAE) women with diabetes	Perspectives in Psychiatric Care	1.015
24	2014	The prevalence of depressive symptoms and its socioeconomic determinants among university students in Al Ain, UAE	International Journal of Pharmacy and Pharmaceutical Sciences	0.51

25	2015	Depression and anxiety among patients with epilepsy and multiple sclerosis: UAE comparative study	Behavioural Neurology	2.088
26	2015	Prevalence of depression and anxiety among patients with epilepsy attending the epilepsy clinic at Sheikh Khalifa Medical City, UAE: A cross-sectional study	Epilepsy & Behaviour	2.061
27	2017	Potential factors impacting health-related quality of life among patients with epilepsy: Results from the United Arab Emirates.	Seizure	2.059
28	2017	Association between muscle function, cognitive state, depression symptoms and quality of life of older people: evidence from clinical practice	Aging clinical and experimental research	2.121
29	2017	Sun Exposure and Behavioural Activation for Hypovitaminosis D and Depression: A Controlled Pilot Study	Community Mental Health Journal	1.159
30	2013	Relationship between eating pathology, body dissatisfaction and depressive symptoms among male and female adolescents in the United Arab Emirates	Eating Behaviours	0
31	2016	Compulsive buying and depressive symptoms among female citizens of the United Arab Emirates	Psychiatry Research	2.682
32	2013	Suicidal behaviour and attitudes among medical students in the United Arab Emirates	Crisis	1.482
33	2017	Suicidal Ideation Is Associated with Altered Variability of Fingertip Photo-Plethysmogram Signal in Depressed Patients	Frontiers in Physiology	3.394
34	2007	Psychological distress among parents of children with mental retardation in the United Arab Emirates.	Social Science & Medicine	2.733
35	2009	Postpartum mental illness: perspectives from an Arabian Gulf population	Psychological Reports	0.667
36	2017	Unstructured play for anxiety in paediatric inpatient care.	Journal of Paediatric Nursing	1.744
37		Indirect measurement of dysfunctional attitudes in bipolar affective disorder	Psychology & Psychotherapy	2.097
38	2015	Use of second-generation antipsychotics in the acute inpatient management of schizophrenia in the Middle East	Neuropsychiatric Disease and Treatment	2.195
39	2010	Eating attitudes and body image concerns among female university students in the United Arab Emirates	Appetite	2.691
40	2013	Relationship between eating pathology, body dissatisfaction and depressive symptoms among male and female adolescents in the United Arab Emirates	Eating Behaviours	0
41	2014	Risk of disordered eating attitudes among male adolescents in five Emirates of the United Arab Emirates.	International Journal of Eating Disorders	3.567
42	2016	Predictors of binge eating in male and female youths in the United Arab Emirates	Appetite	2.691
43	2016	Weight-related teasing and internalized weight stigma predict abnormal eating attitudes and behaviours in Emirati female university students	Appetite	2.691
44	2017	Acculturation, out-group positivity and eating disorders symptoms among Emirati women	Eating and Weight Disorders	2.154
45	2017	Holy anorexia: Eating disorders symptomatology and religiosity among Muslim women in the United Arab Emirates	Psychiatry Research	2.682
46	2010	Subjective life satisfaction and mental disorders among older adults in UAE in general population	International Journal of Geriatric Psychiatry	2.419
47	2011	Attention deficit hyperactivity disorder and environmental toxic metal exposure in the United Arab Emirates	Journal of Tropical Paediatrics	1.187
48	2016	Inclusion of children with developmental disabilities in Arab countries: a review of the research literature from 1990 to 2014	Research in Developmental Disabilities	1.630
49	2007	Prevalence of pervasive developmental disorders in preschool children in the UAE	Journal of Tropical Paediatrics	1.187
50	2011	Dental caries experience, oral health status and treatment needs of dental patients with autism	Journal of Applied Oral Science	1.342
51	2011	Oral health status and dental needs of autistic children and young adults	Special Care in Dentistry	0

52	2015	Physical Status and Feeding Behaviour of Children with Autism	Indian Journal of Paediatrics	0.21
53	2009	Parent adaptation to and parenting satisfaction with children with intellectual disability in the United Arab Emirate	Journal of Intellectual & Developmental Disability	1.347
54	2015	A Novel Single-Nucleotide Deletion (c.1020delA) in NSUN2 Causes Intellectual Disability in an Emirati Child	Journal of Molecular Neuroscience	2.891
55	2017	Identification of a novel CTCF mutation responsible for syndromic intellectual disability - a case report	BMC Medical Genetics	1.913
56	2004	Profile of mental disorders among the elderly United Arab Emirates population: sociodemographic correlates.	International journal of geriatric psychiatry	2.419
57	2006	Serotonin 5-HT _{2A} and 5-HT ₆ receptors in the prefrontal cortex of Alzheimer and normal aging patients.	BMC neuroscience	2.173
58	2010	TUNEL and growth factor expression in the prefrontal cortex of Alzheimer patients over 80 years old.	International journal of immunopathology and pharmacology	2.117
59	2013	Alzheimer disease and diabetes mellitus: do they have anything in common?	Current Alzheimer Research	3.289
60	2017	Semantic word category processing in semantic dementia and posterior cortical atrophy.	Cortex	4.314
61	2017	Olanzapine has poorer efficacy than risperidone for the treatment of the negative symptoms of schizophrenia	Indian journal of psychiatry	0.81
62	2016	Schizophrenia: Impact of psychopathology, faith healers and psychoeducation on adherence to medications	International journal of social psychiatry	1.613
63	2015	Secondary association of PDLIM5 with paranoid schizophrenia in Emirati patients.	Meta gene	0
64	1995	The role of pterins in depression and the effects of anti-depressive therapy	Biological psychiatry	11.412
65	1997	The primary care anxiety and depression (PCAD) scale: a culture-oriented screening scale.	Acta psychiatrica scandinavica	5.605
66	2000	The performance of the Centre for Epidemiologic Study Depression Scale (CES-D) in an Arab female community.	International Journal of Social Psychiatry	1.613
67	2014	-Caryophyllene, a CB ₂ receptor agonist produces multiple behavioural changes relevant to anxiety and depression in mice.	Physiology & behavior	3.033
68	2017	Predictors of Postpartum Depression in Dubai, a Rapidly Growing Multicultural Society in the United Arab Emirates.	Psychiatr Danub	0.10
69	2018	Adult attachment representations and depressive symptoms: A meta-analysis.	Journal of Affective Disorders	3.786
70	1997	Performance of the Hamilton Depression Rating Scale in depressed patients in the United Arab Emirates.	Acta Psychiatrica Scandinavica	5.605
71	2015	Bipolar I and II versus unipolar depression: clinical differences and impulsivity/aggression traits.	European psychiatry	3.912
72	1999	The role of pterins and related factors in the biology of early postpartum depression	European neuropsychopharmacology	4.369
73	2002	Al Ain community survey of psychiatric morbidity II. Sex differences in the prevalence of depressive disorders.	Journal of affective disorders	3.786
74	2004	Central monoamines and their role in major depression.	Progress in Neuro-Psychopharmacology and Biological Psychiatry	4.185
75	2005	Primary care psychiatry: pertinent Arabian perspectives.	East Mediterr Health J	0.663
76	2007	Effects of dietary supplements on depressive symptoms in older patients: a randomised double-blind placebo-controlled trial.	Clinical nutrition	0
77	2011	Testing homocysteine-induced neurotransmitter deficiency, and depression of mood hypothesis in clinical practice.	Age and ageing	3.642
78	2015	Possible involvement of corticosterone and serotonin in antidepressant and anti-anxiety effects of chromium picolinate in chronic unpredictable mild stress induced depression and anxiety in rats.	Journal of Trace Elements in Medicine and Biology	3.755
79	2015	Neuronal correlates of depression.	Cell Mol Life Sci	6.721

80	1997	Problems in validating endogenous depression in the Arab culture by contemporary diagnostic criteria.	Journal of Affective Disorders	3.786
81	1997	The prevalence of early postpartum psychiatric morbidity in Dubai: a transcultural perspective.	Acta Psychiatrica Scandinavica	5.605
82	2018	RMS tactile scale: An innovative tactile anxiety scale for visually impaired children.	Journal of Indian Society of Pedodontics and Preventive Dentistry	0
83	2018	Medical students' perception of test anxiety triggered by different assessment modalities.	Medical teacher	2.450
84	2018	Role of Intelligence Quotient (IQ) on anxiety and behavior in children with hearing and speech impairment.	Special Care in Dentistry	0.180
85	2000	A structural model for predicting mathematics achievement: its relationship with anxiety and self-concept in mathematics.	Psychological Reports	0.667
86	2017	Environmental enrichment reduces chronic psychosocial stress-induced anxiety and ethanol-related behaviors in mice	Progress in Neuro-Psychopharmacology and Biological Psychiatry	4.185
87	2017	Decreased anxiety, voluntary ethanol intake and ethanol induced CPP acquisition following activation of the metabotropic glutamate receptor 8 "mGluR8".	Pharmacology Biochemistry and Behaviour	2.781
88	2017	Slope climbing challenges, fear of heights, anxiety and time of the day.	Behavioural brain research	3.002
89	2016	Factors influencing medical students' self-assessment of examination performance accuracy: A United Arab Emirates study	Education for Health	1.008
90	2016	Nucleus accumbens lentiviral-mediated gain of function of the oxytocin receptor regulates anxiety- and ethanol-related behaviors in adult mice.	Physiology & behaviour	3.033
91	2016	Sustained lentiviral-mediated overexpression of microRNA124a in the dentate gyrus exacerbates anxiety- and autism-like behaviors associated with neonatal isolation in rats.	Behavioural brain research	3.002
92	2016	Play distraction versus pharmacological treatment to reduce anxiety levels in children undergoing day surgery: a randomized controlled non-inferiority trial.	Child: care, health and development	1.201
93	2015	Effectiveness of audio-visual distraction eyewear and computerized delivery of anaesthesia during pulp therapy of primary molars in phobic child patients.	European journal of dentistry	0
94	2015	Effect of preoperative oral midazolam sedation on separation anxiety and emergence delirium among children undergoing dental treatment under general anaesthesia	Journal of International Society of Preventive & Community Dentistry	0
95	2014	Classifying obstructive sleep apnea using smartphones.	J Biomed Inform	2.131
96	2015	How to Improve Eating Behaviour during Early Childhood.	Paediatric gastroenterology, hepatology & nutrition	0.463
97	2011	A prospective case control study of psychiatric disorders in adults with epilepsy and intellectual disability.	Epilepsia	4.706
98	2016	A homozygous splicing mutation in ELAC2 suggests phenotypic variability including intellectual disability with minimal cardiac involvement.	Orphanet journal of rare diseases	3.478
99	2017	Expanding the genetic heterogeneity of intellectual disability.	Human genetics	3.930
100	2019	De novo and inherited TCF20 pathogenic variants are associated with intellectual disability, dysmorphic features, hypotonia, and neurological impairments with similarities to Smith-Magenis syndrome.	Genome medicine	8.898
101	2016	A recessive syndrome of intellectual disability, moderate overgrowth, and renal dysplasia predisposing to Wilms tumour is caused by a mutation in FIBP gene.	American Journal of Medical Genetics Part A, 1	2.264
102	2018	Shared Care Models in the Treatment of Paediatric Attention-Deficit/Hyperactivity Disorder (ADHD): Are They Effective?	Health services research and managerial epidemiology	0
103	2005	Risperidone treatment in 12 children with developmental disorders and attention-deficit/hyperactivity disorder.	Primary care companion to the Journal of clinical psychiatry	0

104	2008	Clinical Correlates of Tourette's Disorder Across Cultures: A Comparative Study Between the United Arab Emirates and the United Kingdom	Primary care companion to the Journal of clinical psychiatry	0
105	2001	Prevalence of tics and Tourette syndrome in an inpatient adult psychiatry setting	Journal of Psychiatry and Neuroscience	5.861
106	2001	Childhood behavioural disturbance in a community sample in Al Ain, United Arab Emirates.	East Mediterr Health J.	0.663
107	2017	Suicidal Behaviour Among People Living with HIV (PLHIV) in Medical Care in Estonia and Factors Associated with Receiving Psychological Treatment.	AIDS and behavior	3.312
108	2013	Suicidal behaviour and attitudes among medical students in the United Arab Emirates.	Crisis	1.482
109	1997	The diagnostic stability of ICD-10 psychiatric diagnoses in clinical practice.	European Psychiatry	3.912
111	2009	Mental health needs of Arab women.	Health Care for Women International	0.950
111	2004	Child psychiatric disorders in a primary care Arab population.	International Journal of Psychiatry in Medicine	0.681
112	1999	Somatised mental disorder among primary care Arab patients: I. Prevalence and clinical and sociodemographic characteristics.	J Psychosom Res.	3.268
113	1999	The rationale, development and reliability of a new screening psychiatric instrument	Soc Psychiatry Psychiatr Epidemiol	2.537
114	1997	The validity of the Arabic Edinburgh Postnatal Depression Scale.	Soc Psychiatry Psychiatr Epidemiol.	2.537
115	1997	Postpartum psychiatric illness in Arab culture: prevalence and psychosocial correlates.	British Journal of Psychiatry	5.867
116	1992	The Dubai Community Psychiatric Survey: I. Prevalence and socio-demographic correlates.	Soc Psychiatry Psychiatr Epidemiol.	2.537
117	2007	Psychological distress among parents of children with mental retardation in the United Arab Emirates.	Soc Sci Med.	2.733
118	2002	Personality profile among primary care patients: experimenting with the Arabic IPDE ICD-10.	Acta Psychiatr Scand.	5.605
119	1997	Sexual dysfunction among type II diabetic men: a controlled study.	Journal of Psychosomatic Research	3.268
120	2013	Obesity hypoventilation syndrome in obstructive sleep apnea patients in the United Arab Emirates: a retrospective cross-sectional study.	JRSM Short Rep	2.700.

LIST OF PUBLISHED PAPERS ON SUBSTANCE USE DISORDERS IN UAE BY TITLE, YEAR OF PUBLICATION, JOURNAL AND IMPACT FACTOR

Serial No.	Year of Publication	Title	Journal	Impact Factor
1	2016	The pattern of substance use disorder in the United Arab Emirates in 2015: results of a National Rehabilitation Centre cohort study	Substance Abuse Treatment, Prevention, and Policy	0.45
2	2017	Physicians' experiences of SBIRT training and implementation for SUD management in primary care in the UAE: a qualitative study.	Primary Health Care Research & Development	1.128
3	2015	Adolescents' perception of substance use and factors influencing its use: a qualitative study in Abu Dhabi	JRSM Open	0
4	2016	Monitoring of adverse drug reactions in psychiatry outpatient department of a Secondary Care Hospital of Ras Al Khaimah, UAE	Journal of Basic and Clinical Pharmacy	0
5	2010	Tobacco smoking and alcohol consumption as risk factors for site-specific intraoral epithelial dysplasia	Journal of Investigative and Clinical Dentistry	0
6	2010	Prevalence and pattern of dokha use among medical and allied health students in Ajman, United Arab Emirates	Asian Pacific Journal of Cancer Prevention	1.50
7	2012	Acute effects of dokha smoking on the cardiovascular and respiratory systems among UAE male university students	Asian Pacific Journal of Cancer Prevention	1.50
8	2012	Tobacco smoking using Midwakh is an emerging health problem--evidence from a large cross-sectional survey in the United Arab	PLOS One	2.766
9	2012	Smokers and marriage: attitude of youth in the United Arab Emirates	Asian Pacific Journal of Cancer Prevention	1.50
10	2012	Smoking prevention and cessation in the Africa and Middle East region: a consensus draft guideline for healthcare providers--executive summary	Respiration.	2.591
11	2013	Cigarette, Water-pipe, and Medwakh Smoking Prevalence Among Applicants to Abu Dhabi's Pre-Marital Screening Program, 2011	International journal of preventive medicine	0
12	2013	Dokha: an emerging public health issue as a form of tobacco smoking in the middle East	Asian Pacific Journal of Cancer Prevention	1.50
13	2014	Prevalence of the tobacco product dokha among high school students in Dubai	Substance Use & Misuse	0.47
14	2015	Tobacco use and associated factors among school students in Dubai, 2010: intervention study	The Eastern Mediterranean Health	0.663
15	2015	Uncovering risky behaviours of expatriate teenagers in the United Arab Emirates: A survey of tobacco use, nutrition and physical activity habits	BMC Public Health	0.91
16	2015	Alcohol-related road traffic injuries in Al Ain City, United Arab Emirates	Traffic Injury Prevention	1.413
17	2017	Developing substance misuse services in United Arab Emirates: The National Rehabilitation Centre experience	BJPsych International	0
18	2017	Emotional Processing in Individuals with Substance Use Disorder and Posttraumatic Stress Disorder	Int J Ment Health Addict	0.12
19	2015	The novel non-imidazole histamine H3 receptor antagonist DL77 reduces voluntary alcohol intake and ethanol-induced conditioned place preference in mice.	Physiol Behav.	3.033
20	2002	Effect of maternal methionine pre-treatment on alcohol-induced exencephaly and axial skeletal dysmorphogenesis in mouse fetuses	Drug and alcohol dependence	3.322
21	2014	Sleep related beliefs and their association with alcohol relapse following residential alcohol detoxification treatment.	Behavioural and cognitive psychotherapy	1.633

22	2013	Increased anxiety, voluntary alcohol consumption and ethanol-induced place preference in mice following chronic psychosocial stress.	Stress	3.252
23	2013	Viral-mediated knockdown of mGluR7 in the nucleus accumbens mediates excessive alcohol drinking and increased ethanol-elicited conditioned place preference in rats.	Neuropsychopharmacology	6.399
24	2012	Involvement of nucleus accumbens dopamine D1 receptors in ethanol drinking, ethanol-induced conditioned place preference, and ethanol-induced psychomotor sensitization in mice.	Psychopharmacology	3.875
25	2010	Oral epithelial dysplasia in non-users of tobacco and alcohol: an analysis of clinicopathologic characteristics and treatment outcome.	Journal of oral science	0
26	1994	Personality study of alcohol, heroin, and polydrug abusers in an Arabian Gulf population.	Psychological Reports	0.667
27	2018	Quantification of Trace Elements in Different Dokha and Shisha Tobacco Products using EDXRF.	Journal of analytical toxicology.	2.858
28	2017	Patterns of electronic cigarette use and level of psychological distress.	PLOS One	2.766
29	2014	Thromboembolic injury and systemic toxicity induced by nicotine in mice.	General physiology and biophysics	1.479
30	2011	Antioxidants alleviate nicotine-induced platelet aggregation in cerebral arterioles of mice in vivo.	Physiol Res.	0
31	2003	PD-136,450: a CCK2 (gastrin) receptor antagonist with antisecretory, anxiolytic and antiulcer activity.	Molecular and cellular biochemistry	2.057
32	2013	Self-medication and related health complaints among expatriate high school students in the United Arab Emirates	Pharmacy practice	0
33	2015	Prevalence of dokha use among secondary school students in Ajman, United Arab Emirates.	Asian Pac J Cancer Prev.	1.5

TOP THREE AUTHORS BASED ON MENTAL HEALTH PUBLICATIONS EXTRACTED FROM 1992- 2019

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