

Research Article

Pharmacologically Altering the Minds of the Old, Sick, and Dying

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The percentage of the world's population that falls into the category of "elderly" has increased and is expected to greatly increase in the upcoming decades. The burden for the physical and mental well-being of the elderly has largely fallen upon health professionals and caregivers in various living environments. This article reviews and discusses the common use of psychotropic drugs among elderly populations worldwide despite the increased sensitivity of the aged central nervous system to the effects of these drugs, and the greatly increased risk for falls, fractures, fainting, and hospital admission for adverse events due to the usage of psychotropic drugs in this age sector. *Psychotropic Polypharmacy*, *Potentially Inappropriate Medication*, and the mind-altering effects of psychotropic drugs in the elderly population are also explained. Finally, we discuss the near-universal usage of psychotropic drugs in *end-of-life protocols* used in palliative care, hospice, and end-of-life treatment centers.

Introduction

The percentage of the world's population above age 60 is increasingly high because we are aging at an extraordinary rate. By 2030, the WHO estimates that 1.4 billion, or 1 in 6 of the world's population, will fall into this category. This elderly population is expected to triple from 2020 to 2050 (WHO, 2023). The use of psychotropic drugs has been increasing significantly over the past two decades in the general population, and especially among older adults worldwide. Mental health diseases such as dementia, depression, and anxiety, as well as chronic pain, are especially prevalent among the elderly population. According to the WHO, the key risk factors for mental health illness among the elderly are social isolation and loneliness (WHO, 2023). The reality of age-related morbidity and mental illness has led to widespread and often dangerous or inappropriate use of psychotropic drugs among the elderly. Whether in community homes, home dwellings, or hospital scenarios, a large proportion of the elderly are taking one or more psychotropic drugs. Among community-dwelling older adults, the rate of psychotropic drug use is reported to be 18 times higher than in the middle-aged adult population (OACNS, 2018). Among nursing homes and psychiatric care units, about 87% of elderly patients are reported to be taking at least one psychotropic drug, and 11% were taking 4 or more (OACNS). The U.S. Department of Health and Human Services examined long-term nursing home elderly residents and found that from 2011 to 2019, about 80% of Medicare's long-stay nursing home residents were prescribed at least one psychotropic drug. Higher psychotropic drug use was associated with a lower nurse-to-resident ratio, while the rate of unsupported schizophrenia reporting increased (Grimm, 2022). Similarly, the vast majority of the elderly population in Western Europe, whether living in residential homes or in the community, is taking one or more psychotropic drugs (Bednarczyk, 2022).

Psychotropic Drugs are Mind-altering

Psychotropic drugs alter the mind through their effects on neurotransmitter signaling in the brain and fall into these categories: antidepressants, anti-anxiety medication, stimulants, antipsychotics, and mood stabilizers. Additionally, though often used for pain management, opiates also slow down the mind and thoughts and thus are medically considered "psychoactive." These drugs often have multiple effects on neurotransmitter signaling that correlate with their mind-altering effects. For example, *quetiapine*, a drug taken for schizophrenia and major depressive disorder, is a dopamine, serotonin, as well as an alpha-2 noradrenergic receptor antagonist. The drug *clozapine* also has multiple targets of action. (Sathyanarayana, 2016). Furthermore, with all psychotropic drugs, there are 1 or more of 10 modes of action by which the brain, and thus the mind, is altered: 1) receptor agonist, 2) receptor partial agonist, 3) receptor antagonist, 4) reuptake inhibitor, 5) reuptake inhibitor and releaser, 6) reuptake inhibitor and receptor antagonist, 7) enzyme inhibitor, 8) ion channel blocker, 9) positive allosteric modulator, 10) enzyme modulator (Sathyanarayana, 2016).

A Brief Note on the Dangers of Psychotropic Drug Use Among the Elderly

This prevalence of the use of psychotropic drugs is a reality despite the well-known observations that this age population is especially susceptible to the adverse effects of these drugs. Older individuals are shown to have a decreased beta-adrenergic response and baroreflex response, while they have increased sensitivity to drug-induced sedation and parasympathetic stimulation of the central nervous system (Jain, 2019). Practices of "Geriatric Psychopharmacology" worldwide persist in spite of the fact that older adults show a greater sensitivity to the effects and side effects of psychotropic drugs and are more likely to experience related falls, skeletal fractures, stroke, hypotension, and mortality as a result (Bednarczyk, 2022). One study that examined the risk of severe adverse drug reactions found that the risk of

falls and syncope was three times greater in elderly adults taking psychotropic drugs than those that do not (Stingl, 2020). Furthermore, studies show that elderly patients taking anticholinergics are at an increased risk for cognitive decline, Alzheimer's disease, and dementia, and this risk is reduced with stopping medication (Carrière, 2009; Gray, 2015).

Psychotropic Polypharmacy among the Elderly

Psychotropic polypharmacy is the prescription of two or more psychotropic drugs at one time. As of 2020, the number of older aged individuals in the United States taking multiple psychotropic drugs had doubled relative to a decade prior. A study of community-dwelling older adults (over 55 years) showed that the use of multiple psychotropic drugs, also known as **psychotropic polypharmacy**, has become common among the elderly and impairs global cognition, executive function, and mobility (Loggia, 2020).

Is it because of Age-related Morbidity?

With increasing age, there is an increasing incidence of all forms of adverse health conditions such as pain and mental illnesses. It stands to reason from the perspective of health professionals that age-associated morbidity warrants the use of psychotropic drugs. For example, opioids are commonly prescribed to the elderly due to the high rates of **chronic pain**. About 50% of older adults in the United States are reported to suffer from chronic pain, and this fraction increases with age (Khan, 2020). A study done on a large sample of elderly individuals in Pennsylvania found that 20.7% of them had filled opioid prescriptions, and of those taking large doses of opioids, there was a significant association with the use of sedatives, hypnotics, anxiolytics, and antidepressants (Khan, 2020). Mental health diseases such as dementia, depression, and anxiety are especially prevalent among the elderly population. According to the WHO, the key risk factors for mental health illness among the elderly are social isolation and loneliness (WHO, 2023). According to the Global Health Estimate in 2019, over a quarter of deaths from suicide occur in the elderly population (WHO, 2023). The proportion of elderly psychiatric inpatients and outpatients among the common elderly population is large, and the use of one or more psychiatric drugs is commonplace. A cross-sectional study of outpatient psychiatric patients 65 years and older revealed that the mean number of psychotropic drug intake was nearly 2 per day (Sahin, 2021). The study researchers estimated that the percentage of potentially inappropriate drug use was 35.7%, and drug-drug interactions were found in 20.9% of patients (Sahin, 2021). Another study of elderly subjects living in nursing homes in Norway showed that 71% of 431 participants were taking one or more psychotropic drugs, and the study also showed a decrease in the quality of life in all stages of dementia for most psychotropic drugs tested (Ito, 2020).

Potentially Inappropriate Medicating of the Elderly

The risk of being prescribed and using **potentially inappropriate medication (PIM)** is also significantly greater among the elderly population. For example, according to *Beers Criteria for psychiatric drugs*, anticholinergics, antipsychotics, antiepileptics, benzodiazepines, opioids, lithium, and duloxetine drug combinations should be avoided due to the increased risk for falls and fractures. A cross-sectional study of psychiatric outpatients in India showed that of 832 elderly patients, 70.7% of them were using drug agents with interactions that were capable of producing *torsades de pointes*, a type of sometimes deadly polymorphic ventricular tachycardia (Das, 2021). A large study in 10 psychiatric hospitals in Germany revealed that 33.9% of 4760 elderly patients were prescribed a potentially inappropriate medication—often anticholinergics, benzodiazepines, and antipsychotics (Hefner, 2020). Similar results were found in studies done in Natal and Lebanon (Moreira, 2020; Yaghi, 2023). In fact, a meta-analysis of 94 studies encompassing 17 countries and

371.2 older patients showed that the use of potentially inappropriate medications was on average 36.7% worldwide (Tian, 2023).

Discussion

The Mind-Altering Effects of Psychotropic Drugs

Psychotropic drugs are often administered under the premise that mental illnesses are caused by neurochemical imbalance, yet despite all the association and correlation studies performed on humans and animals, we cannot conclude that neurochemical imbalance or dysfunction of neurotransmission is the cause of mental health illness. Rather, psychotropic drugs contribute to neurochemical imbalances and dysfunction of neurotransmission, as reported by numerous neurophysiological studies of withdrawal, tolerance, and addiction (Morris, 2024). We can expect this perturbation of neurochemical signaling through administration of psychotropic drugs to be accentuated in the older population due to their heightened response to the effects of psychotropic drugs. Older adults are reported to be 3.5 times more likely to be admitted to the hospital for serious adverse responses to psychotropic drugs (Lindsey, 2009). As we have discussed, psychotropic drugs among the elderly (with or without dementia) are very common in all living situations (community, assisted living, acute care medical and psychiatric units, and nursing homes) (Lindsey, 2009). Due to the discovery of inappropriate prescribing and usage of psychotropic drugs among the elderly, federal legislation mandated a limitation on psychotropic drugs to be placed upon the elderly through the *Omnibus Budget Reconciliation Act of 1987* (Lindsey, 2009). Yet, though there was a decrease in typical antipsychotic medication due to this Act, the use of atypical antipsychotic drugs has increased since then, and SSRIs have significantly replaced tricyclics due to a perception of greater safety. Nevertheless, the reported alarming effects of all types of psychotropic drugs have persisted, and nurses are often untrained in the usage and side effects of psychotropic drugs (Lindsey, 2009). The question stands to be proposed: what causes this staggering rate of falls, syncope, and skeletal fractures in the older population with concurrent psychotropic drug use? Drug-induced hypotension (a common side effect of psychotropic drugs in the elderly due to the heightened central nervous system response) is a plausible means. Additionally or alternatively, consider these mind-altering side effects of common psychotropic drugs:

Mental Effects of Common Psychotropic Drugs

Alprazolam: drowsiness, change in sex drive, mental or mood changes (hallucinations, thoughts of suicide), slurred speech, difficulty talking, loss of coordination, trouble walking, memory problems, seizures

Amantidine: drowsiness, change in sex drive

Aripiprazole: insomnia, Mood changes, depression, compulsive behaviors and visual disturbances, suicidal thoughts or actions, seizures

Asenapine: blurred vision, drowsiness, mental or mood changes (e.g., increased anxiety, depression, suicidal thoughts), mask-like facial expression, seizures, tardive dyskinesia (unusual uncontrolled movements of face, mouth, tongue, arms or legs)

Artane: drowsiness, severe confusion

Atomoxetine: drowsiness, nervousness, mood changes (e.g., confusion, hallucinations, memory problems)

Benzotropine: mood changes, decrease of sexual desire

Bupropion: restlessness, and inability to keep still may occur, unusual strong urges, unusual or uncontrolled movements, severe confusion

Buspirone: blurred vision, mental or mood changes (e.g., agitation, anxiety, confusion, hallucinations), uncontrolled movements, seizures

Carbamazepine: drowsiness, unsteadiness,

Chlordiazepoxide: drowsiness, blurred vision, Mental or mood changes, slurred speech, clumsiness, trouble walking, decreased or increased interest in sex, tremor, uncontrollable movements, sleep disturbances

Chlormazine: drowsiness, blurred vision, trouble sleeping,

Citalopram: drowsiness, decreased interest in sex, seizures, hallucinations, unusual restlessness, loss of coordination, severe dizziness

Clomipramine: changes to psychiatric illness, tiredness

Clonazepam: drowsiness, unusual or sudden changes in mood, thoughts or behavior including confusion, memory problems, signs of depression, suicidal thoughts or attempts, thoughts of harming self

Clonidine: drowsiness, mental or mood changes (such as irritability, depression),

Clozapine: drowsiness, blurred vision, seizures, uncontrollable movements, mental or mood changes

Desvenlafaxine: drowsiness, blurred vision, nervousness, trouble sleeping, decreased interest in sex, seizures, hallucinations, restlessness, loss of coordination

Dexmethylphenidate: Trouble sleeping, nervousness, drowsiness, mood or behavior changes (such as agitation, aggression, mood swings, depression, abnormal thoughts), uncontrolled muscle movements (such as twitching, shaking), sudden outbursts of words or sounds, seizures, strokes

Dextroamphetamine: drowsiness, blurred vision, nervousness, trouble sleeping, decreased interest in sex, seizures, hallucinations, restlessness, loss of coordination

Diphenhydramine: trouble sleeping, Mental, mood or behavior changes (agitation, aggression, mood swings, depression, abnormal thoughts), uncontrolled movements, continuous chewing movements or teeth grinding, outbursts of words or sounds, change in sexual ability or desire, extreme tiredness, slurred speech, confusion

Divalproex: drowsiness, blurred/double vision, uncontrolled eye movements, depression, suicidal thoughts or other mental or mood problems, unsteadiness, seizures

Duloxetine: drowsiness, shaking, sudden mental changes

Escitalopram: drowsiness, tiredness, difficulty sleeping, Unusual or severe mental or mood changes (such as confusion, difficulty concentrating, nervousness, unusual high energy or excitement, rare thoughts of suicide), seizures, hallucinations, unusual restlessness, loss of coordination

Eszopiclone: daytime drowsiness, Memory loss, mental, mood or behavior changes (new or worsening depression, abnormal thoughts, thoughts of suicide, hallucinations, confusion, agitation, aggressive behavior, anxiety)

Fluoxetine: drowsiness, anxiety, trouble sleeping, Unusual or severe mental or mood changes (such as agitation, unusual high energy excitement, thoughts of suicide), seizures, hallucinations, unusual restlessness, loss of coordination

Fluphenazine: Drowsiness, lethargy, Feelings of restlessness, mask-like facial expression, unusual mental or mood changes (e.g., depression, worsening of psychosis), confusion, seizures

Fluvoxamine: drowsiness, trouble sleeping, shaking, decrease in sexual interest, seizures, hallucinations, unusual restlessness, loss of coordination

Gabapentin: Drowsiness, loss of coordination, tiredness, blurred or double vision, usual or sudden changes in your mood, thoughts, or behavior including signs of depression, suicidal thoughts or attempts,

Guanfacine: drowsiness, tiredness, fainting, mental or mood changes (such as depression, confusion)

Haloperidol: drowsiness, sleep disturbances, shaking, shaking, restlessness, mask-like facial expression, drooling, seizures, facial or muscle twitching (tongue thrusting, chewing movements, puffing or puckering of mouth, uncontrollable shaking, seizures, fainting

Haloperidol Decanoate: drowsiness, troubled sleeping, facial or muscle twitching (tongue thrusting, chewing movements, puffing or puckering of mouth, uncontrollable shaking, seizures, fainting

Hydroxyzine: drowsiness, blurred vision, Mental or mood changes (e.g., worsening anxiety, confusion, hallucinations), shaking, seizures

Iloperidone: drowsiness, uncontrollable movements such as lip smacking, mouth puckering, tongue thrusting, chewing, or unusual arm or leg movements, seizures

Imipramine: blurred vision, drowsiness, Mental or mood changes, restlessness, ringing in the ears, sexual problems, shakiness

Lamotrigine: drowsiness, blurred/double vision, drowsiness, Unusual or sudden changes in mood, thoughts or behavior including signs of depression, suicidal thoughts or attempts, thoughts of harming self

Lisdexamfetamine: nervousness, trouble sleeping, irritability or restlessness, mood or behavior changes (agitation, aggression, mood swings, depression, hallucinations, abnormal thoughts or behavior), involuntary movements, muscle twitching or shaking, outbursts of words, blurred vision, slurred speech, slurred speech, confusion, sudden vision changes

Lithium: drowsiness, unsteady walk, confusion, slurred speech, blurred vision, seizures

Lorazepam: drowsiness, blurred vision, changes in sexual desire, Mental or mood changes (such as hallucinations, depression, thoughts of suicide), slurred speech or difficulty talking, vision changes, unusual weakness, trouble walking, memory problems, seizures

Loxapine: drowsiness, blurred vision, severe muscle spasms or cramping (such as twisting neck, arching back, eyes rolling up), restlessness or constant need to move, shaking, slow or shuffling walk, depression or suicidal thoughts, involuntary or repetitive muscle movements such as lip smacking or puckering, tongue thrusting, chewing, or finger or toe movements, seizures, sudden mental or mood changes (such as confusion, loss of consciousness)

Lurasidone: drowsiness, mask-like facial expression, inability to keep still, and agitation may occur, face or muscle twitching and uncontrollable movements (tardive dyskinesia), sudden mental or mood changes

Melatonin: Mental or mood changes (e.g., depression, confusion)

Methylphenidate: Tourette's syndrome, toxic psychosis

Metoprolol: blurred vision, tiredness

Mirtazapine: drowsiness, Hallucinations, unusual restlessness, loss of coordination, muscle twitching or stiffness, loss of consciousness

Modafinil: nervousness, difficulty sleeping, mental mood changes (such as agitation, confusion, depression, hallucinations, rare thoughts of suicide),

Naltrexone: anxiety, tiredness, difficulty sleeping,

Nicotine (gum, lozenge, patch): mental or mood changes (e.g., irritability, trouble sleeping, vivid dreams), confusion, slurred speech

Nuedexta: Muscle twitching, confusion, restlessness

Olanzapine: drowsiness, agitation, confusion, restlessness, difficulty speaking, unusual or uncontrolled movements of face or tongue, seizures

Oxcarbazepine: drowsiness, trouble sleeping, Unusual or sudden changes in mood, thoughts, or behavior including signs of depression, suicidal thoughts or attempts, thoughts about harming self, double vision, change in vision, involuntary eye movements, difficulty speaking,

Paliperidone: restlessness, difficulty sitting still, slow movement, restlessness, seizures, unusual or uncontrolled movements (especially of the face, lips, mouth, tongue, arms or legs), mental or mood changes

Paroxetine: drowsiness, trouble sleeping, Shaking, restlessness, inability to keep still, decreased interest in sex, hallucinations, unusual restlessness, loss of coordination

Pimozide: severe muscle spasms or cramping (such as twisting neck, arching back, eyes rolling up), restlessness or constant need to move, shaking, slow or shuffling walk, drowsiness, Involuntary or repetitive muscle movements such as lip smacking or puckering, tongue thrusting, chewing, finger or toe movements, sudden mental or mood changes (such as confusion, loss of consciousness)

Prazosin: drowsiness, tiredness, blurred vision, mental or mood changes (such as depression),

Propranolol: tiredness, hallucinations (hearing, seeing, tasting, smelling, or feeling something that doesn't exist), uncontrolled mood swings, confusion, mental depression,

Quetiapine: tiredness, drowsiness, Restlessness or constant need to move, shakiness, signs of infection (fever, persistent sore throat), mental or mood changes (increased anxiety, depression, thoughts of suicide), seizures, unusual or uncontrolled movements of face, lips, mouth or tongue

Rameclon: drowsiness, tiredness, decreased sexual desire, Mental or mood changes (e.g., depression, strange thoughts, thoughts of suicide)

Risperidone: drowsiness, difficulty sleeping, nervousness, decreased sexual desire, mental or mood changes, uncontrolled muscle movements, drooling, difficulty swallowing, seizures, frequent falls

Thioridazine: lethargy, drowsiness, restlessness, seizures, blurred vision, confusion

Topiramate: Tiredness, drowsiness, tingling of hands or feet, confusion, slowed thinking, trouble concentrating, nervousness, memory problems, language problems, depression, suicidal thoughts or attempts, other mental or mood problems, loss of consciousness

Sertraline: drowsiness, trouble sleeping, decreased interest in sex, hallucinations, unusual restlessness, loss of coordination

Trazodone: tiredness, drowsiness, blurred vision, change in sexual interest, Shaking, nightmares

Trilafon: drowsiness, blurred vision, tiredness, involuntary or repetitive muscle movements such as lip smacking or puckering, tongue thrusting, chewing, or finger or toe movements (tardive dyskinesia), seizures

Valproic Acid: drowsiness, shakiness, double-blurred vision, sudden mental changes

Venlafaxine: drowsiness, nervousness, difficulty sleeping, decreased interest in sex, hallucinations, unusual restlessness, loss of coordination, seizures, hallucinations, unusual restlessness, loss of coordination

Vilazodone: trouble sleeping, restlessness, inability to keep still, difficulty concentrating, confusion, memory problems, hallucinations, loss of coordination, twitching muscles, unusual agitation or restlessness

Vortioxetine: Shaking (tremor), restlessness, inability to keep still, difficulty concentrating, memory changes, confusion, seizures, loss of coordination

Vraylar: insomnia, drowsiness, restlessness, anxiety, agitation, seizures, blurred vision, Suicidal thoughts or actions, destruction of muscle cells, abnormal movements of face or jaw

Ziprasidone: drowsiness, mental or mood changes (e.g., agitation, anxiety, depression, suicidal thoughts), feelings of restlessness, mask like facial expression, shakiness, seizures, unusual uncontrolled movements of face, mouth, tongue, arms or legs

Zolpidem: Memory loss, mental mood or behavior changes (new or worsening depression, abnormal thoughts, thoughts of suicide, hallucinations, confusion, agitation, aggressive behavior, anxiety), Sleep-driving (driving vehicles while not fully awake)

(all above reported by THHS)

If indeed, the greater part of the elderly population is on psychotropic drugs, and this percentage levels off not far below 100% in considering **end-of-life protocol**, and this age sector is remarkably susceptible especially to the CNS effects of these drugs, then the administration of these drugs is effectively altering the minds of the elderly of our generation, and increasingly and overwhelmingly so as they approach the end of their lives and death. While drowsiness, anxiety, difficulty sleeping, nervousness, and blurred vision are not rare, but common effects experienced by the vast majority of individuals taking psychotropic drugs in the general population of middle-aged adults, the relatively rare mental effects with regard to younger age sectors are much more commonly seen among the elderly. These include “mental and mood changes”, depression, suicidal thoughts, hallucinations, confusion, aggressive behavior, tardive dyskinesia, agitation, restlessness, sleep-driving, involuntary or repetitive movements, language and speech problems, memory loss, suicidal thoughts and behaviors, seizures, and various other forms of paranormal bodily and facial movements and vocalizations (see list above). The drugs are altering the minds of the elderly.

End of Life Protocol

As elderly individuals or severely sick and dying patients approach death, hospitals worldwide are apt to employ standard *end-of-life treatment*. Standard end-of-life protocol prioritizes physical and mental comfort. As individuals approach death, fear, anxiety, depression, and panic are common experiences. The National Institute on Aging states:

“End-of-life care can also include helping the dying person manage mental and emotional distress. Someone who is alert near the end of life might understandably feel depressed or anxious... The dying person may also have some specific fears and concerns. He or she may fear the unknown, or worry about those left behind. Some people are afraid of being alone at the very end. These feelings can be made worse by the reactions of family, friends, and even the medical team. For example, family and friends may not know how to help or what to say, so they stop visiting, or they may withdraw because they are already grieving. Doctors may feel helpless and avoid dying patients because they cannot help them further. And some people may experience mental confusion and may have strange or unusual behavior, making it harder to connect with their loved ones. This can add to a dying person's sense of isolation.” (NIA)

End-of-life treatment almost invariably involves the use of one or more psychotropic drugs to treat both the mental challenges faced and other physical symptoms, including pain, breathlessness, and nausea. These drugs are often narcotics, antipsychotics, and sedatives such as atropine, haloperidol, lorazepam, morphine, and prochlorperazine. Pharmacy Times states, “Adequate pain management is considered a universal requirement in health care.⁵ Pain control is also recognized as a central component of providing optimal hospice care (Farinde, 2020).” The same article explains the common protocol for pain management, beginning with initial steps employing short-term pain medications: Vicodin, Percocet, or Lortab, which are all combinations of codeine and either aspirin or acetaminophen, and more extensive treatment through strong narcotics for patients exhibiting a greater degree of pain (Farinde, 2020). Of note, though effective for pain management, opiates also slow down the mind and thoughts, and thus are medically considered “psychoactive” and lead to tolerance and abuse in many cases among all age sectors. Opiate use also clearly increases the risk of falls, fall injuries, and fall fractures in elderly individuals (Yoshikawa, 2020). Midazolam, a sedative, or opiates are prescribed for breathlessness. Antipsychotics such as metoclopramide, haloperidol, or levomepromazine are often prescribed for nausea. The vast majority of dying patients face at least one of these symptoms, and for palliative care, hospice, and end-of-life treatment centers, addressing these symptoms with drugs is obligatory.

Unanimous Findings

As one might expect, the rate of *Potentially Inappropriate Medications* in palliative care is very high (Pyper, 2019; Sevilla-Sánchez, 2017; Lindsay, 2014). An observational multicenter study done in 7 palliative care centers in the USA discovered that patients were taking close to 5 drugs on the day of their death, with the vast majority taking pain medication and psycholectics (van Norden, 2016). A study in South Australia at a palliative care center found that patients were taking a mean number of 4.9 drugs upon admission, and that this increased about 2.5 times as death approached (Currow, 2007). A retrospective cohort study with deceased patients in a palliative care center in the Netherlands reported that morphine, midazolam, and haloperidol were the most common drugs used upon admission (21%, 11%, 23% respectively), and that the use of these drugs increased to 87%, 58%, and 50% respectively (Masman, 2015). Furthermore, as patients reached the end of their lives, the drugs were given mainly through the subcutaneous route as opposed to orally (94% subcutaneous on the day of death). Similarly, a palliative care center in Portugal showed that on the day of death, close to all patients were taking opioid analgesics, a significant percentage were also taking hypnotics, antidepressants, and antipsychotics, and a minority were also

taking antiepileptics and anxiolytics (Peralta, 2022). A cross-sectional descriptive study in 23 geriatric wards in Belgium found that the majority of patients were given anticipatory prescriptions of psychotropic drugs (morphine, benzodiazepines, scopolamine) (Van Den Noortgate, 2016). In a university hospital in Vienna, 90% of palliative care patients were being prescribed drugs for pain and anxiety, with most patients taking over 4 drugs on the day of their death (Kierna, 2016). Similar findings were observed in an MD Anderson Cancer Center in Texas, 30 cancer centers located in 12 European countries, three different regions of the Netherlands, a hospice care center in Italy, a study of hospice care units in Northern Ireland (Hui, 2005; Paque, 2018; Pasina, 2019; Arevalo, 2018; Lundy, 2013). Many more studies could be cited, and the findings are unanimous. The minds of the elderly population are being altered with drugs as they approach death in care centers. Whether psychotropic drugs are given for pain, breathlessness, nausea, or mental challenges, they are being administered and taken by the elderly as they approach death, and especially on the day of death.

Conclusion

We have observed that the use of psychotropic drugs is prevalent in the elderly population, even relative to middle-aged adults. This is due to the increase in age-associated physical morbidity and mental challenges faced with aging. This reality is despite the increased sensitivity of the brains of the elderly to the effects and side effects of psychotropic drugs, the risk for falls, fall injuries, fainting, skeletal fractures, and admissions to the hospital for adverse events related to the use of commonly prescribed psychotropic drugs. The incidence of *Potentially Inappropriate Medication* use, especially concurrent with *psychotropic polypharmacy*, is also higher in elderly populations. We have also discussed the mind-altering side effects of a lengthy list of commonly prescribed psychotropic drugs. Furthermore, as individuals reach the end of their lives in palliative care, hospice, and other end-of-life care centers, the majority of them are administered multiple drugs, usually psychotropic drugs, for the treatment of physical and mental discomfort. It can be reasonably concluded that our world is giving a large percentage of elderly individuals psychotropic drugs, which alter the state of the mind, through the administration of health care, and this is overwhelmingly the case as they approach the end of their lives.

Statements and Declarations

Statement of Significance: This article reviews and discusses the broad and universal use of psychotropic drugs, which alter the mind through pharmacological mechanisms in the brain, among elderly individuals of our generation as they approach death.

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