



2023

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Recommended Citation

Crowley, Kyara G.; Fuchs, Connor N.; and Johnson, Sydney L., "The Impact of Sensory Deprivation and Sensory-Based Intervention for Incarcerated Adults Over the Age of 65" (2023). *Critically Appraised Topics*. 68.

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The Impact of Sensory Deprivation and Sensory-Based Intervention for Incarcerated Adults Over the Age of 65

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***This resource was written by doctoral-level students in fulfillment of the requirements of the Occupational Therapy course “OT 403 - Clinical Research Methods in Occupational Therapy” at the University of North Dakota School of Medicine and Health Sciences, under the advisement of Professor/Course Director Anne Haskins, Ph.D., OTR/L, Assistant Professor Breann Lamborn, EdD, MPA, Professor Emeritus Gail Bass Ph.D., OTR/L, and Research and Education Librarian Devon Olson Lambert, MLIS.



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Focused Question

How does the use of sensory-based interventions improve the quality of life for older adults over the age of 65, who are incarcerated in the United States?

Case Scenario

This critically appraised topic (CAT) focuses on sensory-based interventions for improving the quality of life for older adults who are incarcerated in the United States. There are many aspects to this topic; sensory deprivation in the prison system is addressed first, followed by the importance of sensory-based interventions, and finally the relationship between occupational therapy and quality of life.

Sensory Deprivation in the Prison System

The population within the United States criminal justice system is aging more rapidly than that of United States population as a whole. The number of older adults who are incarcerated has tripled since 1990 (Williams et al., 2012) with a total population of individuals in federal custody over the age of 65 totaling 4,377 as of February 2023 (Federal Bureau of Prisons, 2023). This increase has shown a need for expanded capacity and medical resources for aging adults in our correctional system. The rise in aging populations also brings an increase of sensory deprivation for these individuals, and the need for evidence-based intervention to improve quality of life. Sensory deprivation is defined as the decreased input of sensory stimuli that leads to adaptive or maladaptive changes in the brain, because of the individual being limited to a small space for long periods of time with little to no variation of experiences (Mohan & Vanneste, 2017; Resnik et al., 2020).

Sensory-Based Interventions

Sensory deprivation can be detrimental to one's health and well-being and it is crucial to combat this phenomenon with an effective strategy. (Mohan & Vanneste, 2017) The use of sensory-based intervention is a good example of an effective strategy for reversing sensory deprivation. Sensory-based interventions are interventions used to address challenges one may have with their sensory modulation (Garder et al., 2012). Sensory modulation is defined as “the capacity to regulate and organize the degree, intensity, and nature of responses to sensory input in a graded and adaptive manner” (Garder et al., 2012, p. 165). Some examples of sensory-based interventions include light, aromatherapy, massage, and Snoezelen rooms. (Smith & D’Amico, 2020) Sensory integration is important for any person, and it is crucial that one learns how to regulate this type of input. Sensory integration can be described as “the neurological process that organizes sensation from one’s own body and from the environment and makes it possible to use the body effectively within the environment.” (Garder et al., 2012, p. 164). Unfortunately, individuals who are placed in prisons do not experience a healthy amount of sensory input and this makes returning to society a very challenging process for someone who has served their sentence. (Craswell et al., 2021) This is why implementing sensory-based interventions in the prison system should have a positive impact on adults who are in the prison system.

Sensory-based interventions can be utilized in many different settings and are effective interventions with a plethora of populations. Some common populations that you will see sensory-based interventions are being used with include people diagnosed with ADHD and autism spectrum disorder, trauma survivors, people with behavioral problems, and in this case,



people who have been incarcerated. (Gophna, 2016; McGreevy & Boland 2020; Wan Yunas et al., 2015) These populations are some of the most common where it has been shown that sensory-based interventions are helping individuals regulate emotions, decrease aggression, improve mental health, and regulate sensory input. (Craswell et al., 2021) In regard to individuals in the prison setting, sensory- based interventions help these individuals learn strategies and skills that make living in incarceration more barrable and reentering society successfully more possible. All these factors will help improve their quality of life. (Craswell et al., 2021)

Quality of Life and Occupational Therapy

Quality of life is defined uniquely by every individual and there is not one set definition. Since quality of life is a multidimensional concept, mental health, physical health, aspects of the environment, and functional status will be included under the category of quality of life for the purpose of this critically appraised topic (Center for Disease Control [CDC], 2018). It has been found that quality of life is related to chronic disease and that measuring an individual's quality of life can help to determine disease, injury, and disability (CDC, 2018). This critically appraised topic focuses on the quality of life of individuals in the prison system, especially those who are older adults, aged 65 and older, and may have been in the system for a long time.

Occupational Therapists (OTs) are unique professionals who are able to provide interventions to aid in the quality of life for those in custody. While OTs can play a significant role in addressing the needs of those within the prison system, the profession does not have many OTs working in this setting (Muñoz, et al., 2016). There is a need for occupational therapists within the criminal justice system so that they can help those who are sensory deprived and who do not have a good quality of life. Additionally, occupational deprivation has been found to be prominent during incarceration and can affect the quality of life for prisoners (Smith, et al., 2018). One way that occupational therapists have been able to address occupational and sensory deprivation is by providing sensory-based interventions for areas like activities of daily living (ADLs), independent activities of daily living (IADLs), health management, and social participation (AOTA, 2020).

The Person-Environment-Occupation (PEO) model is the best fit when addressing the focused question of this CAT. The PEO model focuses on what surrounds the person and what affects them. Factors include person, environment, occupation, and occupational performance (Baptiste, 2017). In this case, the person is made up of older adults, aged 65 and older, who are prisoners. The environment includes the prison or criminal justice system. Finally, the occupational focus is on ADLs and health management.

Purpose Statement

Currently, there is a lack of evidence exploring the use of sensory-based interventions and the quality of life of older adult prisoners. Therefore, the purpose of this critically appraised topic is to determine how the use of sensory-based interventions can improve the quality of life for older adults over the age of 65 who are incarcerated in the United States.



Synthesized Summary

Methodology

The resources for this critically appraised topic were found through an initial literature search done by three researchers. Searches occurred on educational, occupational therapy, and allied health databases including PubMed, CINAHL, EBSCO Host, and SAGE. Inclusion criteria for these articles was that participants needed to be 18 years old, must either be incarcerated or in an inpatient mental health setting, and must address either sensory interventions or sensory deprivation. Articles were excluded if the participants were younger than 18 years of age. Search terms that were used to acquire these articles include “occupational therapy” “sensory integration” “incarceration” “prison” “United States” “adults” “sensory processing” “sensory intervention” “sensory-based intervention” “quality of life” “prison settings” “custody” “sensory” “coping” “criminal justice system” “well-being” “health” “sensory deprivation” “sensory modulation” “older adults” “elderly”, and searches were completed between February 22 and March 26, 2023. Additionally, “AND” and “OR” were used between key terms and phrases to promote better search phrases and results. The three researchers then came together to determine which articles would be used for the final paper.

Types of Articles Reviewed

A total of 27 articles and resources were selected for in-depth review for the purposes of this critically appraised topic. Of these articles seven were level I studies (Craswell et al., 2021; Gophna, 2016; McGreevy & Boland, 2020; Schaaf et al., 2018; Smith & D’Amico, 2020; Wan Yunus et al., 2015; Xiao et al., 2021), two were level III (Clemons et al., 2006; O’Callaghan et al., 2018), three were level IV (Couth et al., 2018; Fischer et al., 2016; Gardner et al., 2012), and ten were level N/A (Bryant, 1991; Jaegars et al., 2020; Mohan & Vanneste, 2017; Muñoz et al., 2016; Reiter et al., 2020; Resnik et al., 2020; Skowronski & Talik, 2021; Smith et al., 2018; Wigglesworth & Farnworth, 2016; Williams et al., 2012). See Table 1 for an overview of research articles reviewed for this CAT. Other resources utilized were government resources (Federal Bureau of Prisons; HRQOL Concepts), the Occupational Therapy Practice Framework – 4th Edition (AOTA, 2020), and select chapters from occupational therapy textbooks (Baptiste, 2017; Muñoz, 2011). The following: (Bryant, 1991; Clemons et al., 2006; Gardner et al., 2012; Muñoz, 2011) are articles published more than 10 years ago. However, due to the lack of research in this area, they are still prevalent and resourceful for this CAT. Articles used in this CAT are in reference to adults with sensory deprivation in the prison setting. Additionally, the articles pertain to quality of life and mental health within the prison setting. Interventions are centered around improving quality of life, ADLs, and health management through sensory-based approaches. Furthermore, the majority of the reviewed articles have an occupational therapy aspect included.

Table 1

Articles Reviewed

Citation	Design	Population	Review
Bryant, 1991	Case Study	Elderly patients living in psychiatric hospitals	This article addressed the role of occupational therapy when caring for elderly individuals who



			have been institutionalized.
Clemons et al., 2006	Level III Non-Randomized Control Trial	2946 participants with Age-Related Eye Diseases (AREDS)	The data from this study suggested a possible association between age-related eye diseases and cognitive impairment for older individuals.
Craswell et al., 2021	Level I Integrative Review	Inpatient Mental Health	An integrative review, that looked at the effectiveness of sensory modulation approaches in prison-based mental health settings.
Couth et al., 2018	Level IV Single-Subject Design	Adults recruited from a local university and community groups.	Designed to study reaction times within older and younger adults.
Fischer et al., 2016	Level IV Longitudinal Population-Based Study	1,884 individuals without cognitive impairment at baseline testing between 1998 and 2000.	Showed that the relationship between sensory impairment and cognitive impairment is not unique to one sensory system.
Garder et al., 2012	Case Study	Inpatient Psychiatric	Described how occupational therapy practitioners develop programs for sensory-based treatment.
Gophna, 2016	Level I Review	Children with Autism Spectrum Disorder	Provided literature review findings and practical use of sensory-based interventions.
McGreevy & Boland, 2020	Level I Integrative Review	Adult and Adolescent Trauma Survivors	Showed the emerging area of practice of sensory-based intervention for adult and adolescent trauma survivors.
Mohan & Vanneste, 2017	Literature Review	Individuals who have experienced various forms of sensory deprivation	Stated that sensory deprivation results in adaptive or maladaptive changes in the brain.
Muñoz et al., 2016	Descriptive Design	Incarcerated Individuals in the U.S.	Aimed to define the role of occupational therapy intervention for incarcerated individuals in the U.S.
O'Callaghan et al., 2018	Level III Non-Randomized Control Trial	56 Older Adults	Findings implied that significant differences in shape a size of cortical sites involved in balance control may be present in older adults.



Reiter et al., 2020	Level N/A Interview	106 randomly selected individuals in solitary confinement	Illustrated the public health crisis of solitary confinement.
Resnik et al., 2020	Law Review	Lower Court Opinions	Reviewed hundreds of lower court opinions to learn how judges rule on solitary confinement, and demonstrated the role judges play in defining what is “normal” in prisons.
Schaaf et al., 2018	Level I Systematic Review	5 Articles Reviewed	Found that the body of evidence supporting Sensory Integration Theory (ASI) is growing and evidence supports the efficacy of ASI interventions.
Skowronski & Talik, 2020	Survey	390 Prison Inmates	Aimed to understand the different variables that affect quality of life in prisons.
Smith & D’Amico, 2020	Level I Scoping Review	47 Articles Reviewed	Explored the effectiveness of sensory-based interventions for clients with dementia and Alzheimer’s disease living in residential facilities.
Smith et al., 2018	Level IV Survey	48 Adult Participants	Concluded that implementing occupation-based programs during incarceration may reduce the number of barriers individuals experience and increase quality of life.
Wan Yunus et al., 2015	Level I Systematic Review	14 Articles Reviewed	Found tactile-based interventions such as massage therapy to be the most promising intervention in reducing behavioral problems.
Williams et al., 2012	Case Study	Geriatric individuals in the U.S. Criminal Justice system	Outlined the aging crisis in the U.S. Criminal Justice system.
Xiao et al., 2021	Level I Systematic Review	36 “Hearing Loss” Studies	Showed that sensory impairment is associated with poor cognitive function in older adults.



Synthesis of Evidence

Impacts of Sensory Deprivation on Older Adults in Prison Settings

Impact on Individuals in Prison Settings

Historically, the issues surrounding treatment practices and solitary confinement in the United States criminal justice system have been a source of debate across both scientific and entertainment platforms (Resnik et al., 2020). Solitary confinement in the United States criminal justice system began to expand in the 1980's, and it is estimated that every state in our country had implemented such practices by 1997 (Reiter et al., 2020). Research has shown the increased likelihood of individuals developing mental health problems such as anxiety and depression was extremely prevalent, as well as displaying self-harming behavior after being subjected to sensory deprivation practices like solitary confinement (Reiter et al., 2020). Not only has the practice of solitary confinement led to adverse mental health consequences, but it also leads to a decrease in external sensory stimulation for the individual (Reiter et al., 2020). Prison and jail systems are often unable to provide adequate mental health care due to a lack of resources available (Muñoz, 2011). Limited research exists for occupational therapy in prison settings. However, inpatient mental health is a well-established field within the occupational therapy profession that allows us to hypothesize some of the sensory difficulties that incarcerated individuals face. Craswell et al., noted that even though there are unique challenges to both settings, they have multiple similarities. Personnel in both settings work with individuals who are experiencing occupational disturbances. Personnel in both settings are tasked with helping individuals to develop safe emotional management mechanisms through interdisciplinary intervention for a variety of diagnoses such as Schizophrenia, bipolar disorder, depression, PTSD, and many others (Craswell et al., 2021). Using the knowledge that occupational therapists have on sensory systems and the integration of sensory interventions (Schaaf et al., 2018), we can reason that occupational therapy intervention can be valuable to this population.

Impact on Older Adults

Sensory impairments increase with aging (Fischer et al., 2016). One factor is a decrease in external stimuli which leads an individual to experience sensory deprivation (Mohan & Vanneste, 2017). As a result of this stimulus decrease, the brain experiences sensory uncertainty. The uncertainty in the brain's process of sensory information requires compensation. Compensation, defined as "the process of overcoming losses and deficits through one of several neural mechanisms" (Mohan & Vanneste, 2017, p. 2) can influence the aging and damaging processes associated with sensory decline. Xiao et al., noted in a review from 2021 that damage to auditory, visual, and olfactory sensory systems is correlated with cognitive decline or dementia (Xiao et al., 2021). The author's findings in their review are consistent with the sensory impairment theory (SIT). SIT suggests that an individual with a visual (or any other sensory impairment), would be deprived of their ability to engage in daily occupations, thus resulting in a decrease of external stimulation for the brain and leading to cognitive decline and dementia (Clemons et al., 2006). By combining the findings of these two articles, we can reason that older adults who experience sensory deprivation or damage to sensory systems are at an increased risk for developing dementia and other cognitive impairments over time.



Benefits of Sensory-Based Interventions

Impact of Sensory-Based Interventions on Older Adults

Sensory deprivation is a serious problem for an individual's well-being, and it is a common phenomenon within the older adult population (Bryant, 1991). According to Couth et al (2018), older adults already experience a decrease in sensory organ function and unisensory cortical processing. In the study, Couth et al suggested, “reduced white matter connectivity in older adults might affect long-range networks between sensory brain regions, it is reasonable to assume that the interaction between sensory signals would also be affected with increasing age” (p. 152). Considering this, older adults are a vulnerable population for developing sensory processing challenges, which can have negative impacts on one’s quality of life and well-being. Sensory-based interventions are an effective approach for older adults to combat the challenges that arise from sensory deprivation. Implementing sensory-based interventions into an older adult's life has positive impacts on their multisensory and unisensory systems (Couth et al., 2018). Sensory-based interventions have also been found to increase gray matter in the brain of eighteen participants through a study that took before and after MRIs of the brain (O’Callaghan et al., 2018). Some positive changes that one can observe happening in an individual participating in sensory-based interventions include self-awareness, the developing of non-verbal responses, and encouraging spontaneous and creative responses (Bryant, 1991). There is still a need for more research on sensory-based interventions and they need to be investigated further (Bryant, 1991).

Impact of Sensory-Based Interventions in Prison Settings

In the prison setting, sensory deprivation and physiological changes can cause a lot of challenges for an older adult who has been incarcerated (Reiter et al., 2020). Being locked up in a non-stimulating environment for an extended period of time can have long-lasting, negative effects on an individual. “A prison setting can impose unique challenges, such as highly structured and monotonous routines, geographic isolation, loss of freedom, security presence, restricted movements, restricted access to items/tools, and limited activity choice” (Craswell et al., 2021, p. 133). In addition, if the incarcerated older adult is also experiencing physiological changes on top of everything, the effects could be detrimental to their sensory processing skills, health, and well-being (Craswell et al., 2021; Reiter et al., 2020). These negative impacts can make it hard for one to re-enter into society and be successful once they are free to be outside of incarceration (Craswell et al., 2021). Sensory-based interventions help these individuals learn strategies and skills that make living in incarceration more bearable and reentering society successfully more possible. Sensory-based interventions such as sensory modulation approaches have an impact “on emotion regulation, distress reduction, and decreased use of seclusion and restraints” (Craswell et al., 2021, p. 132). Some examples of sensory-based interventions that may be performed in the prison setting include all these factors that have been shown to help improve inmates’ quality of life (Craswell et al., 2021).

Impact of Occupational Therapy

Quality of Life

Based on current research, it has been shown that when individuals are incarcerated, it can lead to a decline in quality of life because of the deprivation of autonomy, freedom, and



social contact that they experience (Skowroński & Talik, 2021). These aspects of a person are important parts of quality of life as well as other aspects like their culture, values, and spirituality (CDC, 2018). Additionally, imprisonment has been shown to correlate with suicide risk and severe suicide attempts due to mental health problems, aggression, impulsivity, hostility, trauma, hopelessness, and low levels of social support and self-esteem (Skowroński & Talik, 2021). Social support is one of the most significant predictors of an individual's quality of life, along with resilience and the ability to adapt to a difficult environment (Skowroński & Talik, 2021). Also, mental health issues have been seen to increase in prevalence in the environment of prison settings (Craswell, et al., 2021). Therefore, according to these authors, when individuals become incarcerated, they are unable to have access to social support, and their quality-of-life decreases. In a survey, Smith, et al. (2018) found that environmental barriers to areas of freedom, physical safety, security, accessibility and quality of health and social care, leisure activities, and physical environment were present. Additionally, the authors concluded that the implementation of occupation-based programs for incarcerated individuals would help to reduce these barriers and improve their overall quality of life, health satisfaction, psychological health, physical health, and relationships (Smith, et al., 2018).

ADLs and Health Management

Within occupational therapy, professionals can address many different areas of occupation. For individuals who are incarcerated, some of the main occupations that are impacted include ADLs and health management (AOTA, 2020). One way that these occupations can be addressed is through sensory-based interventions or sensory modulation (Craswell, et al., 2021). Through interventions, OTs can target areas of ADLs like personal hygiene, bathing, eating, and functional mobility for prisoners (AOTA, 2020). For the area of health management, social and emotional health promotion, communication with the health care system, physical activity, and nutrition management can be addressed (AOTA, 2020). According to Muñoz, et al. (2016), current research indicates that there are not many OTs or occupational programs within the prison setting. Craswell, et al. (2021) noted that a potential reason for this lack of an OT presence in the criminal justice system is due to it being highly structured, isolating, security presence, restricted movements, restricted access to items/tools, and limited activity choice.

Limitations

This critically appraised topic paper as well as the profession of occupational therapy itself includes some limitations. One limitation is the lack of research in the area of sensory deprivation and sensory-based interventions in the prison setting. Part of the reason for this limitation is that occupational therapists and researchers have a lack of access to incarcerated adults within the prison (Craswell, et al., 2021; Muñoz, et al., 2016). Additionally, a limitation is presented by the lack of information provided related to gender and the differences between men and women in the criminal justice system (Skowroński & Talik, 2021). Furthermore, there is a lack of mental health knowledge and resources within the prison setting (Craswell, et al., 2021; Muñoz, 2011).

Summary

After reviewing the available research through the lens of the PEO Model (Baptiste, 2017), it was found that the fit between older adults who have been incarcerated and sensory-based interventions seem to correlate, and the amount of sensory deprivation added to and



individuals' life while in a prison setting can have a negative impact on their quality of life (Skowroński & Talik, 2021). Sensory-based interventions are a useful tool that can be implemented in a prison setting to combat the negative effects that come from sensory deprivation, and overall improve their quality of life (Skowroński & Talik, 2021; Smith, et al., 2018).

Focus Question

How does the use of sensory-based interventions improve the quality of life for older adults over the age of 65, who are incarcerated in the United States?

Clinical Bottom Line

The overall purpose of this critically appraised topic (CAT) was to determine the use of sensory-based interventions for older adult individuals (65 years and older) who are incarcerated in areas of quality of life, ADLs, and health management. Upon reviewing the literature for this CAT, it has been shown that sensory-based interventions are a useful tool that can be used to combat the negative effects of sensory deprivation for older adults who live in a prison setting (Bryant, 1991; Couth et al., 2018; Craswell et al., 2021). Sensory deprivation is a phenomenon that is a common occurrence for older adults who reside in a prison setting (Mohan & Vanneste, 2017). Sensory deprivation can inhibit an individual's sensory processing abilities and can make it difficult for someone to re-enter society after being released from incarceration (Reiter et al., 2020). Sensory-based interventions should be implemented in prison settings because there is research that suggests these types of interventions have a positive impact on quality of life and well-being for older adults and who are experiencing sensory deprivation while incarcerated (Craswell et al., 2021; Skowroński & Talik, 2021; Smith, et al., 2018).

Based on the current research about occupational therapy and quality of life, it has been found that imprisoned individuals lack autonomy, freedom, and social contact as well as aspects of culture and spirituality, which have led to a decrease in quality of life (CDC, 2018; Skowroński & Talik, 2021). Additionally, certain aspects of mental health have been shown to correlate with a decline in quality of life and are impacted by the environment of the prison setting (Craswell et al., 2021; Skowroński & Talik, 2021). Through the theoretical model of PEO (Baptiste, 2017), occupational therapists (OTs) can help to address these areas of decreased quality of life as well as ADLs and health management (AOTA, 2020). While OT interventions have been shown to be effective in addressing these areas, there is a lack of OT programs being established in prison settings (Muñoz, et al., 2016). We recommend that further research be conducted so that these OT programs can be established in prisons and incarcerated individuals can receive more care to increase their quality of life.

In addition to occupational therapists, there are some other professions that may be involved in the care of incarcerated adults over the age of 65. Physicians and nurses should be accessible to these individuals for care of their overall health since they can be more susceptible to sensory deprivation and damage to their brain (Mohan & Vanneste, 2017). Psychologists would also be beneficial for this population due to the increase of mental health problems (Craswell et al., 2021; Skowroński & Talik, 2021). Furthermore, the people who work in prisons, including correctional officers and judges, would be a part of the team to ensure safety and proper regulation be upheld for both the healthcare professionals and the incarcerated individuals (Resnik et al., 2020). Additionally, a stakeholder would be the family members of the



incarcerated adults because they could be affected by the well-being of that incarcerated family member.

Additionally, prison settings as OT practice contexts can be overlooked due to the bias that exists regarding prisoners and their right to a quality of life (Skowroński & Talik, 2021). There are many other biases to be wary of when conducting a research study involving this population. For example, sample bias is something to note when creating a research study because it is important to have samples that represent the populations well and effectively. Subjective bias, as in the researcher's definition of quality of life, is also something to be cognizant of when trying to avoid bias in this research (Skowroński & Talik, 2021 & Smith, et al., 2018). It will also be important for the researchers to take the cultural characteristics into account when studying and working in a prison setting. Some of these cultural characteristics to be aware of include the prisoner's beliefs, values, and cultural norms (Primm et al., 2005). In addition, when working with the older population it is crucial to steer clear of all forms of ageism.

In conclusion, there is a lack of research and evidence pertaining to sensory-based interventions in the prison setting and there is a limited number of available articles. Among the evidence reviewed, there is a lack of scientific rigor. In the future, more level I and level II studies should be completed in order to understand the effectiveness of sensory-based interventions. More research needs to be completed focusing on the impact of occupational therapy intervention in this setting, as well as the impact of sensory-based interventions for older adults who have been incarcerated. As of the writing of this CAT, we anticipate that occupational therapy can improve the quality of life for individuals over the age of 65 in prison settings, but the lack of evidence is a limiting factor in identifying the level of significance.



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