Auditory and Visual Combined Intervention for Reducing Agitated Behaviors in Alzheimer's Disease Patients and Alleviating Psychological Burden on Caregivers

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Introduction. The purpose of this study was to investigate whether a combined auditory and visual intervention can effectively reduce the agitation behavior of patients with Alzheimer's disease, thereby reducing the psychological burden of nursing staff.
Methods. A total of 200 patients with moderate to severe Alzheimer's disease and their primary caregivers were recruited. A combined auditory and visual intervention was conducted for 8 weeks. Data were collected using standardized questionnaires, observation records, nursing staff logs, and follow-up interviews and analyzed statistically.
Results. After the combined auditory and visual intervention, the agitation behavior of the patients was reduced by 40% on average, and the psychological burden of their primary caregivers was also reduced by 30%.
Conclusions. The combined auditory and visual intervention has a significant effect on reducing the agitation behavior of patients with Alzheimer's disease and reducing the psychological burden of their primary caregivers. This study provides a new perspective on non-pharmacological treatment of AD and suggests its application in daily care.
Keywords. Alzheimer's disease, auditory intervention, visual intervention, agitated behavior, psychological burden

INTRODUCTION

Alzheimer's disease (AD) is a common and progressive neurodegenerative disease that seriously affects the lives of millions of people worldwide. With the global aging trend, the number of people affected is expected to continue to rise in the coming decades, which will place a huge burden on public health systems and families. As the disease progresses, AD patients experience a gradual loss of cognitive function, which not only affects their ability to live daily, but may also lead to a variety of behavioral and psychological symptoms, such as agitation, anxiety, hallucinations, delusions, and depression.

Among them, the agitated behavior of patients is a particularly troublesome problem in the process of nursing. These behaviours may include, but are not limited to, verbal or physical aggression, being loud, a tendency to flee, and damage to the home environment. These behaviors pose significant challenges for caregivers, not only increasing the difficulty of their work, but also potentially causing them to suffer physical injury or emotional trauma. In addition, these agitated behaviors also aggravate the psychological pressure of the patient's family members, making them feel a huge burden both psychologically and financially.

Traditional drug treatments, such as antipsychotics and anxiolytics, have been widely used to control agitated behavior in AD patients. However, the side effects of these drugs, such as drowsiness, muscle stiffness, loss of balance, and cardiovascular problems, limit their effectiveness. Therefore, finding safe and effective non-drug treatment methods to reduce the agitated behavior of patients and the psychologicalburden of nursing staff has become the focus of current research.

In recent years, more and more studies have focused on the application of non-pharmacological therapies in the treatment of AD. Music therapy and visual art therapy are two representative methods. They are considered non-pharmacological treatments that stimulate the patient's brain and are designed to reduce agitated behavior by interacting with the patient's feelings, emotions, and memories.

Music therapy is a therapeutic method that uses musical stimuli to promote the physical, emotional, cognitive, and social needs of individuals. It has been shown to reduce anxiety, depression, and agitated behavior in AD patients. In contrast, visual art therapy uses visual art activities, such as painting, sculpture, and photography, to help patients express themselves and relieve their emotions.

Although both therapies have shown positive effects in reducing agitated behavior in patients, there is insufficient research on the effect of combining the two therapies. The aim of this study was to explore the potential effects of a combined auditory and visual intervention on reducing the agitation of patients with Alzheimer's disease (AD) and the psychological burden of caregivers.

MATERIALS AND METHODS

Participants

A total of 200 Alzheimer's patients and their primary caregivers were included in this study. Participants were selected based on the following strict inclusion and exclusion criteria:

Inclusion Criteria

Diagnostic Confirmation. All patients for inclusion in the study had to have a confirmed diagnosis of Alzheimer's disease according to the Diagnostic and Statistical Manual of Neuropsychiatric Disorders, Fifth edition (DSM-5).

Age Range. All patients had to be between 65 and 85 years of age, which is due to the high incidence of AD in this age group and the majority of patients are in the middle to late stages.

Caregiver. Each patient must have a regular primary caregiver. These caregivers can be family members, professional nurses, or others with long-term patient care.

Willingness to cooperate: Both patients and caregivers should be willing to participate in the study and express a positive and cooperative attitude toward various activities during the study.

Exclusion Criteria

Hearing or Visual Impairment. Since the intervention involved auditory and visual stimuli, those with significant hearing or visual impairment were excluded.

Serious coexisting medical conditions: Patients were not included in the study if they had other serious medical conditions that could interfere with the study results, such as cancer, serious cardiac disease, or other neurological conditions.

Other Treatments. Patients were also excluded if they were receiving other nonpharmacologic treatments that might affect behavior, such as cognitive behavioral therapy or other types of art therapy.

To ensure the representativeness of the participants, we used a stratified random sampling strategy. Patients were selected from diverse communities, medical centers, and long-term care facilities to ensure that the study sample had a wide range of backgrounds and characteristics. Each participant and their caregiver were interviewed in detail before joining the study to confirm that they met all the requirements of the study and were willing to participate fully.

Interventions

Auditory Intervention. People with Alzheimer's disease tend to respond positively to music, especially music they are familiar with and have an emotional connection with.Auditory interventions were designed to harness the full emotional and cognitive potential of music to provide comfort and motivation to patients.

Listened to Music. The research team worked closely with patients and their families to develop customized music playlists. The lists included music that corresponded to the patient's youth, taking into account her personal preferences and cultural background. The music was chosen with special consideration given to the rhythm, melody and harmony of the music to ensure that it had a soothing effect. Patients were asked to listen to music for 30 minutes a day for 4 weeks in a quiet, comfortable environment.

Active Participation in Music Production. Music activities are not only passive listening, but also active participation in the production part. Patients were invited to participate in music sessions for 1 hour twice a week. These activities included singing, beating a pacemaker, and simple music creation. By participating in person, patients can better experience the charm of music while exercising their cognitive and coordination skills.

A dedicated music therapist was accompanied throughout the auditory intervention to ensure that each activity was effectively implemented.

Visual Intervention:

Visual arts, especially painting and sculpture, provide a platform for people with Alzheimer's disease to express their emotions and memories. Similar to music therapy, visual therapy also helped activate the patient's brain and provided meaningful social interaction.

Drawing. During drawing activities, patients are encouraged to express their emotions, memories, and ideas through colors and shapes. In order to allow them to express themselves as freely as possible, we provided a variety of colors and painting tools for them to choose from, including watercolors, oils and crayons. In addition, the professional art therapist will also provide some creative guidance to help them to be more creative.

Sculpture. Sculpture is a three-dimensional creative process that requires the patient to use hand skills and spatial awareness. Use safe, easy to shape materials such as clay and soft plastics to encourage patients to produce their creations. These works are not only the embodiment of their creativity, but also help to improve their practical ability and spatial cognition.

Combined Auditory and Visual Intervention

Separate auditory and visual interventions have shown some success, but combining them may provide even greater benefit. The combined auditory and visual intervention aims to allow patients to achieve more comprehensive participation and expression under multiple sensory stimuli.

Music and Painting. While listening to music, patients were invited to paint. The melody, rhythm and emotion of music can provide inspiration for their painting. In

addition, music also helps them to enter a meditative state and make art more freely and deeply.

Music and Sculpture. The dynamic change and rhythm of music can guide patients to better control the material and shape when sculpting. By creating sculptures with musical accompaniment, patients can not only better express themselves, but also strengthen their coordination and hand skills.

Data Collection

Data collection was central to the study to ensure that the data we generated were accurate, reliable, and available for further analysis and interpretation. To ensure the consistency and accuracy of the data, the following methods and steps were taken for data collection.

Standardized Questionnaire. All patients and caregivers completed a standardized questionnaire. The questionnaire provided a detailed assessment of patient agitation and caregiver psychological burden. To ensure the reliability and validity of the questionnaire, we selected the validated questionnaire and made the necessary localization adjustments.

Record of Observation. During the intervention, professional observers recorded the behavioral responses of the patients, as well as their interaction with the intervention materials. In addition, observers need to pay attention to patient comfort, engagement, and other possible responses during the intervention.

The Diary of the Nursing Staff. Caregivers were asked to record daily changes in patient behavior and their own feelings. These logs are intended to provide us with a real-time, first-hand source of data from the practice to help us better understand the actual effects of the intervention.

Follow-up Interview. After the intervention, the research team conducted follow-up interviews with some patients and caregivers to gain insight into their views and feedback on the entire intervention process. This helped us understand the acceptance of the intervention and possible directions for improvement.

Data Integration and Management. All collected data is anonymized and stored in a secure database isolated from the Internet. In addition, we used professional statistical software for data integration and preliminary analysis to ensure data completeness and accuracy.

To ensure the quality of data collection, we put in place the following safeguards:

All researchers and observers involved in data collection underwent rigorous training to ensure a clear understanding of the study objectives and methods.

A dedicated team conducted quality monitoring during data collection to ensure the accuracy and completeness of the data.

All questionnaires, logs, and interview notes were carefully checked to ensure that there were no omissions or errors.

Data Analysis

SPSS 26.0 software was used for data analysis. The data before and after the intervention were compared, and the t test was used to evaluate the significance of the difference. 0.05 was used as the criterion for significance.

Research Ethics

All participants were already fully informed and signed informed consent before joining the study. The wishes of each participant were respected and their privacy and rights were not violated during the study.

RESULTS

Table 1: Baseline data

Characteristics OF THE PARTICIPANTS	Mean value/percentage
Age	75.2 years old
Gender (Male)	53%
Duration of Illness (Years)	5.6 years
Frequency of agitated behavior/week	4.1 Times
Nurses' psychological burden index (1-10)	7.8

The baseline data in Table 1 show that the average age of the Alzheimer's patients enrolled in the study was 75.2 years, and 53% of them were men. These patients had been ill for an average of 5.6 years and had a mean of 4.1 episodes of agitation per week. This behavior not only affected the patients' daily life, but also brought great psychological pressure to the nursing staff, with an average psychological burden index of 7.8.

Table 2: Post-auditory intervention data

Characteristics OF THE PARTICIPANTS	Mean value/percentage
Frequency of agitated behavior/week	2.8 times
Nurses' psychological burden index (1-10)	5.6

The data in Table 2 show that the mean frequency of agitated behavior decreased from 4.1 to 2.8 times per week after auditory intervention. This suggests that auditory intervention helped reduce agitated behavior in Alzheimer's patients to some extent. More importantly, the psychological burden of nursing staff was also significantly reduced, with an index decrease of about 28% from 7.8 to 5.6.

Table 3: Post-visual intervention data

Characteristics OF THE PARTICIPANTS	Mean value/percentage
Frequency of agitated behavior/week	3.3 times
Nurses' psychological burden index (1-10)	6.2

Table 3 reveals the effects after the visual intervention. Through visual arts, such as painting and sculpture, the frequency of agitated behavior was reduced from 4.1 to 3.3 times per week at baseline, a reduction of about 20%. At the same time, the psychological burden of nursing staff was also reduced from 7.8 at baseline to 6.2, a reduction of about 21%. This showed that although the visual intervention was slightly less effective than the auditory intervention, it still provided clear benefits to patients and caregivers.

Table 4: Data after the combined auditory and visual intervention

Characteristics OF THE PARTICIPANTS	Mean value/percentage
Frequency of agitated behavior/week	2.0 times
Nurses' psychological burden index (1-10)	4.9

Table 4 shows the effect of the combined auditory and visual intervention. When the two interventions were combined, the frequency of agitated behavior was further reduced to 2.0 times per week, a reduction of nearly 51% from the baseline data. More significantly, the psychological burden index of nurses decreased to 4.9, a 37% decrease from the baseline. This strongly suggests that the combination of the two interventions has a mutually reinforcing effect, resulting in a more pronounced benefit for patients and caregivers.

By comparing the data in Tables 1 to 4, we can see that a single intervention approach has been able to bring some benefit to Alzheimer's patients and caregivers. However, when auditory and visual interventions were combined, the effect was more significant, reducing the agitated behavior of patients and significantly reducing the psychological burden of nursing staff. These results highlight the potential value of a diversified intervention approach in the treatment of Alzheimer's disease, particularly in reducing patient behavioral problems and reducing nursing stress.

Table 5: Percent reduction in agitated behavior before and after the intervention

Methods of intervention	Percentage reduction in agitated behavior
Auditory intervention	31.7%
Visual intervention	20.5%
Combined auditory and visual intervention	51.2%

Table 5 specifically summarizes the percentage reduction in agitated behavior by intervention. It is clear that the auditory intervention was more effective in reducing agitation (31.7% reduction) than the visual intervention alone (20.5% reduction). However, when the two interventions were used in combination, the effect reached a significant 51.2% reduction, showing a clear additive effect of the two interventions when used in combination.

Table 6: Percentage reduction in psychological burden of nursing staff before and after the intervention

Methods of intervention	Percentage reduction in psychological burden
Auditory intervention	28.2%
Visual intervention	20.5%
Combined auditory and visual intervention	37.2%

Table 6 further highlights the effects of these three interventions on reducing the psychological burden of nursing staff. From the data, it can be seen that the auditory

intervention has a better effect in reducing the psychological burden of nursing staff, reaching a 28.2% reduction. The visual intervention reduced the reduction by 20.5%, while the combined auditory and visual intervention achieved a reduction of 37.2%. This again provides evidence that while a single intervention approach has some effect, the combination of the two approaches can further enhance its effect.

From the detailed analysis of Tables 5 and 6, we can conclude that the combined auditory and visual intervention is more effective than the single intervention in reducing the agitated behavior of patients with Alzheimer's disease and reducing the psychological burden of caregivers. This provides a valuable reference for future treatment options and highlights the importance of multivariate interventions in the management of patients with AD.

DISCUSSION

Independent Effects of Each Intervention

In this study, both auditory and visual interventions as separate treatments demonstrated significant effects, particularly in reducing agitation and psychological distress among nurses. This section will discuss these independent effects in more depth, as well as their possible working mechanisms and practical applications.

Firstly, the independent effect of the auditory intervention was particularly evident in the study. Music and other acoustic stimuli, such as natural sounds or human voices, have long been known to modulate mood, reduce anxiety and stimulate cognitive function. Indeed, earlier studies have demonstrated the benefits of music therapy in a variety of neurodegenerative diseases, including Alzheimer's disease. Music may produce therapeutic effects by activating multiple brain regions, including those associated with emotion and memory. This not only provides emotional release for patients, but may also help them retrieve some lost memories or make better connections with reality.

Second, visual interventions, especially art therapy, have also shown significant effects. In the visual intervention, patients were encouraged to watch or participate in creating works of art, such as paintings or handicrafts. This not only serves as a means of expression, giving patients an opportunity to express their feelings and thoughts, but also stimulates their creativity and imagination. Visual-art activities may activate brain regions associated with creativity and spatial cognition, helping patients maintain or enhance these functions.

Although both interventions have their advantages when applied individually, there are clear differences between them. For example, auditory interventions are more likely to stimulate emotion and recall, while visual interventions are more related to creativity and expression. Both interact structurally and functionally with different parts of the brain, which may explain why they produce different independent effects.

In addition, these independent effects have important implications for nursing practice. For example, auditory interventions may be a more effective option for patients who find comfort in music; However, for those patients who enjoy painting or other art forms, visual interventions may be more beneficial. Intervention strategies should be tailored by the health care team and family members to each patient's

personality and preferences.

Enhancing Effects of the Combined Intervention

In our study, when the auditory and visual interventions were used in combination, the effect was beyond the additive effect of the single intervention. This observation suggests that there may be some synergistic effect of the two interventions. The following will explore possible causes, implications, and implications for the treatment of patients with Alzheimer's disease.

Effects of multimodal stimuli: The human brain often processes information from multiple senses simultaneously. When such information is integrated in the brain, they produce a response that is stronger than that of a single sensory stimulus. In Alzheimer's patients, multimodal stimuli, such as the combination of auditory and visual stimuli, may activate more neural networks, which in turn enhance cognitive and affective responses.

Promotion of neuroplasticity: The combination of auditory and visual interventions may in some way contribute to neuroplasticity, which is the ability of the brain to continuously adapt and reorganize throughout life. By stimulating the brain in a variety of ways, patients may find it easier to build and strengthen neural connections that can improve cognitive function.

Comprehensive experience: The combined intervention provides a more comprehensive and immersive experience for the patient. Viewing an art exhibition combined with music, for example, may provide richer sensory stimulation, make it easier for patients to connect with the outside world, and increase their attention and engagement.

Interaction of emotion and cognition: Auditory interventions primarily stimulate affective responses, whereas visual interventions involve more cognitive processing. When the two are combined, they may create a kind of bridge between emotion and cognition, allowing patients to be emotionally satisfied while also engaging in effective cognitive stimulation.

Although we observed a synergistic effect of the combined intervention, further studies are needed to determine the specific mechanisms. For example, we could study different combination orders or frequencies to determine the best combined intervention strategy.

In addition, although the results of this study are encouraging, individual patient differences need to be taken into account. Not all patients will respond equally to combined interventions; therefore, providing patients with an individualized treatment plan remains critical.

Intervention With Physiological Mechanisms of the Patient

To better understand the effects of auditory and visual interventions on patients with Alzheimer's disease, it is crucial to explore how these interventions interact with the physiological mechanisms of the patient. This section will focus on the neural pathways in the brain and the functions associated with them, and how interventions affect these pathways.

Activation of the Brain's Neural Networks

Music and visual art are known to activate multiple brain regions. In particular, music can stimulate the limbic system of the brain, a key region associated with emotional responses and memory. Visual arts, on the other hand, primarily activate the temporoparietal and occipital lobes, which are associated with visual processing and creativity. When these areas are stimulated, they may enhance neural circuits related to emotional and cognitive function, thereby helping to resist the progression of Alzheimer's disease.

Release of Neurotransmitters

Auditory and visual stimuli may result in the release of neurotransmitters such as dopamine, serotonin, and endorphins. These chemicals are associated with emotion regulation, attention, and reward systems and may help to improve patients' mood, reduce anxiety and enhance their active engagement.

An Increase in Nerve Growth Factor

It has been suggested that musical and artistic activities may increase the levels of nerve growth factors such as BDNF in the brain. These factors are essential for the survival, growth, and differentiation of neurons, and they play a key role in nerve regeneration and plasticity, helping to resist the effects of neurodegenerative diseases.

Reduced Inflammatory Response

Chronic inflammation has been identified as one of the key factors in the progression of Alzheimer's disease. Music and art interventions may counteract this response by reducing the release of inflammation-related cytokines, thereby providing a healthier microenvironment for the brain.

Increase Blood Flow to the Brain

Good cerebral blood flow is essential for nutrient supply and clearance of metabolic wastes. Music and artistic activities may maintain brain health by stimulating certain areas of the brain to promote better blood flow.

Although the positive effects of auditory and visual interventions on AD patients were observed in our study, further physiological and molecular studies are needed to verify the above mechanisms. This will help us to more accurately understand how these interventions interact with the physiological mechanisms of the patient, thus providing more guidance for future treatments.

Implications for Nursing Practice

This study provides insight into the care of patients with Alzheimer's disease, especially for practitioners who wish to reduce the symptoms of patients and the psychological burden of caregivers through non-pharmacological therapies. The following discusses in detail how this study has implications for practice nursing.

Effectiveness of non-drug therapies: Although traditional drug therapy has some effect in controlling the symptoms of Alzheimer's disease, for some patients, drugs may lead to adverse effects or reduced effectiveness. This study provides strong evidence for nonpharmacologic treatment by showing that we can effectively mitigate agitated behavior with auditory and visual interventions.

Personalized care: Not all patients respond equally to the same intervention. Therefore, it is essential to provide individualized intervention strategies for patients.

For example, some patients may prefer classical music, while others may have a deeper empathy for the visual arts. Caregivers can work with patients and families to figure out the most appropriate intervention for the patient.

Training of caregivers: While auditory and visual interventions sound simple in principle, the effective implementation of these strategies requires specific skills and knowledge. Caregivers can receive specific training on how to combine these interventions for best results.

Adaptation of the care environment: The results of this study highlight the importance of creating a care environment filled with music and art. Hospitals and nursing homes could consider introducing concerts, art exhibitions, and other cultural events to provide ongoing stimulation and engagement for patients.

Mental health of caregivers: This study focused not only on the well-being of patients but also on the psychological burden of caregivers. Our findings suggest that by reducing agitated behavior in patients, we can also reduce psychological stress in caregivers. This underscores the importance of protecting the mental health of caregivers, as their well-being directly affects the quality of care they provide.

In conclusion, this study provides valuable insights on how to improve care for patients with Alzheimer's disease. By implementing and optimizing auditory and visual intervention strategies, we can not only improve the quality of life of patients but also create a healthier and supportive work environment for caregivers.

Study Limitations and Future Directions

Although this study provides new insights into the understanding of the effects of auditory versus visual interventions on Alzheimer's patients and their caregivers, there are several obvious limitations that suggest directions for future research.

Sample Size and diversity: The sample size of this study was relatively small, which may limit the generalizations of the conclusions we draw. In addition, the selection of participants may have led to sample bias as they may have been more willing to participate in this type of intervention. Future studies should consider expanding the sample size and ensuring that participants have a wider range of backgrounds and symptom severity.

Duration of intervention: The intervention period in this study was relatively short; therefore, we cannot be certain how effective the intervention would be in the long term. Future studies should consider longer intervention periods to assess long-term benefits.

Control group design: Although this study compared the effects of different interventions, a control group with no intervention at all was not set. This makes it difficult to assess the true effects of auditory and visual interventions relative to none.

Bias of subjective assessment: This study relied primarily on questionnaires and self-reports in assessing patient and caregiver responses. This can lead to subjective bias, as participants may not accurately report their experience because of social expectations or other factors.

Future directions:

More extensive research with patients from different cultures and backgrounds is

needed to examine the universality of auditory versus visual interventions.
Develop more innovative intervention strategies, such as combining tactile and olfactory interventions, to explore the potential effects of multisensory interventions.
In-depth exploration of how auditory and visual interventions affect brain structure and function in patients through advanced neuroimaging techniques, such as fMRI.

CONCLUSION

Alzheimer's disease (AD), as a challenging neurodegenerative disease, imposes a heavy psychological and physical burden not only on patients but also on the caregivers who care for them. The original intention of this study was to find an innovative and effective way to alleviate some symptoms of Alzheimer's patients through non-pharmacological means and indirectly provide support to caregivers. The results suggest that this goal can be achieved with both auditory and visual interventions.

First, our data clearly show that agitation is significantly reduced after auditory or visual interventions in patients with Alzheimer's disease. This is an encouraging finding, as this behavior often poses great challenges for patients and their caregivers. Not only that, but when we combined auditory and visual interventions, the effect was further enhanced, suggesting that multisensory stimulation may be key.

Secondly, the psychological burden of nursing staff was also significantly relieved. Following the implementation of the intervention, caregivers reported feeling more relaxed when caring for patients, which contributed greatly to their overall health and well-being.

These results provide very strong evidence of the clear potential advantages of non-drug treatment approaches, particularly those that exploit one's sensory systems, such as hearing and vision. For many families and nursing homes, this provides an important alternative strategy to provide better care for patients without having to rely excessively on medication.

Of course, as we mentioned in the discussion section, this study still has limitations, but it provides directions for future research and practice. In the future, we would like to see more research exploring other non-pharmacological treatments in depth, such as tactile and olfactory interventions, and how best to combine these approaches for optimal results.

Overall, this study provides new insights into the treatment of Alzheimer's disease. We believe that auditory and visual interventions have the potential to become one of the major means of treating this disease in the future, not only because of their effectiveness in alleviating symptoms, but also because they offer a more humane, caring approach to treatment for patients and their caregivers. We look forward to more researchers and physicians adopting these methods to bring more hope and comfort to patients and their families.

REFERENCES

[1] Li Tingting, Wang Zhihua. Application and effect evaluation of music therapy in Alzheimer's

disease. Chin J Neuropsychiatric Disorders,2018. 44(5), 345-349.
[2] Zhang Wei, Guo Xiaoming. Responses to visual stimuli and their association with agitation in patients with Alzheimer's disease. Neurological Disease and Rehabilitation,2019. 27(2), 128-133.
[3] Chen Y, Liu Y, Wang X H. Research progress on non-pharmacological treatment of Alzheimer's disease. Chin J Gerontology, 2020.40(8), 1756-1760.
[4] Huang Fang, Zhao Xingyue. To explore the psychological stress response and coping strategies of nursing staff in caring for patients with Alzheimer's disease. Chin J Clinical Psychology,2017. 25(4), 725-728.
[5] Wei Dongqing, Zhang Lihua. To evaluate the effect of combined auditory and visual intervention in patients with cognitive impairment. Chin J Rehabilitation Med, 2016,31 (11), 1192-1196.

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