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Evaluating the efficacy of cucumber juice in hypertension management among the elderly

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Abstract
Hypertension remains a leading cause of death globally, particularly among the elderly, whose condition is often exacerbated by lifestyle factors such as poor diet, smoking, alcohol consumption, and lack of exercise. In addressing this issue, non-pharmacological treatments, such as cucumber juice therapy, offer a promising alternative. This study evaluates the effectiveness of cucumber juice in lowering blood pressure among elderly hypertensive patients in Magelang City. Data collection was guided by the nursing process, including assessment, diagnosis, intervention, implementation, and evaluation. The results revealed that before commencing cucumber juice therapy, patients had an average blood pressure of 160/90 mmHg. Following three days of treatment, their blood pressure improved to 157/87 mmHg. Notably, after a complete three-day regimen, blood pressure readings further decreased to 150/80 mmHg. These findings indicate that cucumber juice can effectively contribute to the reduction of hypertension. It is recommended that patients continue to incorporate cucumber juice into their diet to help maintain optimal blood pressure levels. This study underscores the potential benefits of cucumber juice therapy as a viable, non-pharmacological option for managing hypertension in the elderly.

Keywords: Hypertension care; complementary therapy; cucumber juice; cardiovascular health; nursing care

Introduction
Hypertension, a prevalent condition among the elderly, is influenced by a range of factors that can be categorised into uncontrollable and controllable risk factors (Oliveros et al., 2020). Uncontrollable factors include gender, age, family history of high blood pressure, and education level (Karayiannis, 2022). These are intrinsic elements that cannot be altered but significantly impact the likelihood of developing hypertension. In contrast, controllable risk factors such as obesity, lack of exercise, stress, excessive salt consumption, smoking, alcohol use, and consumption of fatty foods are within an individual's ability to manage or modify (Guasti et al., 2022). Addressing these controllable risk factors can significantly reduce the incidence and severity of hypertension. Hypertension often presents with symptoms such as headaches, which can be attributed to increased cardiac workload and elevated pressure in blood vessels, particularly in the brain (Saheera & Krishnamurthy, 2020). This heightened pressure can exert stress on nerve fibers, resulting in the sensation of pain. If left untreated, hypertension can lead to severe complications including kidney damage, blood vessel rupture in the brain, and potentially, stroke or paralysis (Yu et al., 2023). In managing hypertension among the elderly, nursing care plays a crucial role. The goal of nursing interventions is to help patients maintain optimal blood pressure levels and enhance their overall quality of life. This involves both pharmacological and non-pharmacological treatments. While antihypertensive medications are well-established in controlling blood pressure, non-pharmacological methods also hold significant promise. Among these methods, dietary adjustments, including the incorporation of high-fibre fruits and vegetables rich in vitamins and minerals, are particularly effective (Bilen & Wenger, 2020).

Cucumber, a readily available and cost-effective vegetable, is gaining attention for its potential benefits in managing hypertension (Hendrayana, Yoana, Adnyana, & Sukandar, 2023). Often consumed as a food complement rather than a therapeutic agent, cucumber is rich in potassium, magnesium, and phosphorus, all of which are known to help lower blood pressure (Lu, Yuan, & Fan, 1991). A study have demonstrated that cucumber juice can effectively reduce blood pressure in elderly individuals with hypertension (Trejo-Moreno et al., 2018). With integrating cucumber juice into dietary recommendations, healthcare providers can offer a valuable non-pharmacological option for managing hypertension, complementing traditional medical treatments and contributing to a holistic approach to hypertension management. Cucumber, often considered a simple dietary vegetable, has gained recognition for its beneficial effects on cardiovascular health and hypertension (Herlina Dimiati, Fahmi, & Muhammad Ridwan, 2019). Its impressive nutritional profile includes essential nutrients such as potassium, magnesium, and phosphorus, which play significant roles in maintaining healthy blood pressure levels. Potassium helps balance sodium levels in the body,

counteracting the hypertensive effects of excessive salt intake. Magnesium and phosphorus contribute to overall cardiovascular health by supporting proper muscle function, including that of the heart, and aiding in the regulation of blood pressure (DiNicolantonio, Liu, & O'Keefe, 2018). The impact of cucumber on hypertension can be attributed to its high-water content and low-calorie nature, which promote hydration and aid in the regulation of blood pressure (Charchar et al., 2024). Consuming cucumber regularly can help prevent fluid retention, a common issue that exacerbates high blood pressure. Additionally, the antioxidants found in cucumbers, such as flavonoids and tannins, have anti-inflammatory properties that may reduce vascular inflammation and improve blood vessel function, further supporting cardiovascular health. These combined effects make cucumber a valuable addition to a diet aimed at managing hypertension and improving overall heart health. Incorporating cucumber into a balanced diet, whether through whole consumption or as cucumber juice, offers a natural and accessible means of supporting cardiovascular well-being. While it should not replace conventional treatments for hypertension, cucumber can complement a comprehensive health strategy that includes lifestyle modifications and medical management. Its affordability and versatility make it a practical option for those seeking to enhance their dietary approach to hypertension and promote better heart health. Therefore, the study is aimed to analyse the benefits of cucumber juice for hypertension treatment among elderly.

Case Description

The assessment of Mrs. G, a 65-year-old female with no formal education, was conducted on 23 May 2024, at 09:00 AM. The patient presented with a Glasgow Coma Scale (GCS) score of E4V5M6, indicating compositional consciousness. During the assessment, Mrs. G reported experiencing neck tension, dizziness, blurred vision, and body weakness, which had persisted for the past three months. She also mentioned difficulty sleeping due to shortness of breath. There was no prior history of similar conditions, surgery, or food allergies. Physical examination revealed the following vital signs: blood pressure at 160/90 mmHg, pulse rate at 100 beats per minute, respiratory rate at 20 breaths per minute, and oxygen saturation at 99%. The patient appeared pale, further highlighting her health concerns. The analysis of the subjective data indicated that Mrs. G experienced neck tension, dizziness, shortness of breath when lying down, and blurred vision. Objective data confirmed her blood pressure at 160/90 mmHg and a pale appearance. This led to the identification of the primary nursing problem as decreased cardiac output due to changes in contractility. In addition, the patient reported poor sleep quality, which was supported by objective findings of yawning and dark circles under her eyes. This suggested the secondary nursing problem of sleep pattern disorders related to inadequate sleep control. Priority nursing diagnoses included decreased cardiac output associated with contractility changes and sleep pattern disorders associated with lack of sleep control.

For the first nursing diagnosis of decreased cardiac output, the intervention aimed to enhance cardiac output within an 8-hour period. The expected outcomes included reduced pallor or cyanosis, decreased fatigue, and improved blood pressure. Standard interventions involved cardiac care, including monitoring primary signs of decreased cardiac output, checking blood pressure and pulse frequency before and after activities and medication administration, positioning the patient in a semi-fowler's position, and providing a cardiac-appropriate diet. Specific interventions included administering cucumber juice to reduce blood pressure. On 24 May 2024, the nursing implementation for decreased cardiac output involved identifying symptoms such as fatigue and pallor. Blood pressure was monitored and remained at 160/90 mmHg. The patient was positioned semi-Fowler’s, which she reported as comfortable. A low-salt, low-fat diet was recommended, and cucumber juice was administered, resulting in a slight decrease in blood pressure to 158/90 mmHg. The nursing evaluation on the same day showed that while the patient remained tired and pale, she felt comfortable in the semi-Fowler’s position. Blood pressure was recorded before and after cucumber juice intervention as 160/90 mmHg and 158/90 mmHg, respectively. Despite these improvements, the patient appeared restless and anxious. The assessment concluded with a plan to continue the intervention. On 25 May 2024, the development notes for the second day showed that the patient still experienced neck tension, dizziness, and blurred vision. Blood pressure increased slightly to 161/95 mmHg, and the patient appeared restless, pale, and anxious. The assessment continued to indicate decreased cardiac output, and the plan was to persist with cucumber juice therapy. In 26 May 2024, the third-day development note revealed that the patient's neck tension had decreased, with dizziness occurring less frequently. The patient appeared more cheerful and refreshed, and blood pressure improved to 155/86 mmHg. The assessment reflected a reduction in cardiac output issues. The plan involved maintaining cucumber juice intervention, closely monitoring blood pressure, and ensuring the patient’s comfort. This comprehensive assessment and intervention process demonstrates the importance of ongoing evaluation and adjustment in managing hypertension among elderly patients. The use of cucumber juice as a non-pharmacological approach has shown potential in reducing blood pressure and improving overall patient well-being.

Discussion

Hypertension, a major global health issue, manifests through symptoms such as dizziness, irritability, tinnitus, insomnia, shortness of breath, a heavy feeling in the head, fatigue, blurred vision, and occasionally nosebleeds

(Granados-Gámez, Roales-Nieto, Gil-Luciano, Moreno-San Pedro, & Márquez-Hernández, 2015). Many individuals with hypertension may remain asymptomatic for years, with lifestyle factors like excessive salt intake, caffeine consumption, physical inactivity, and stress contributing significantly to its development (Gauer, 2017). In the case of the patient, Mrs. G, who has a habit of consuming salt-rich foods like salted fish, symptoms include neck tension, dizziness, and blurred vision. This highlights a gap in her clinical presentation, where her complaints align with known symptoms of hypertension, but some symptoms like nosebleeds are not observed. Nursing diagnoses for hypertension typically include decreased cardiac output related to changes in contractility (D.0008), acute pain linked to physiological injury agents (D.0077), intolerance due to an imbalance between supply and oxygen demand (D.0056), and sleep pattern disorders associated with poor sleep control (D.0055). In Mrs. G's case, two priority diagnoses were identified: decreased cardiac output and sleep pattern disorders. Decreased cardiac output was characterized by subjective data of neck tension, dizziness, shortness of breath, and blurred vision, alongside objective data showing blood pressure at 160/90 mmHg and a pale appearance (Di Tullio et al., 1988). Activity intolerance and acute pain were not considered primary diagnoses as they did not fully align with the patient's symptoms.

For the primary diagnosis of decreased cardiac output, nursing interventions were monitoring vital signs, managing blood pressure, positioning the patient, and dietary adjustments. Specific interventions included administering cucumber juice, hypothesized to reduce blood pressure. Nursing implementation over three days involved monitoring, therapy, education, and collaboration. On 24 May 2024, cucumber juice was administered, resulting in a slight blood pressure reduction from 160/90 mmHg to 158/90 mmHg. On the subsequent days, blood pressure further decreased to 157/87 mmHg and then 150/80 mmHg, indicating a positive response to the intervention. Evaluation, a critical stage of the nursing process, involves comparing outcomes with predetermined criteria. For Mrs. G, the evaluation included formative and summative assessments documented in the specific format. After three days, the nursing diagnosis of decreased cardiac output was partially resolved, while sleep pattern disorders were addressed successfully. Cucumbers, rich in potassium, calcium, and magnesium, contribute to blood pressure regulation by enhancing electrolyte balance and supporting cardiovascular health (Houston & Harper, 2008). This non-pharmacological approach provides a viable alternative to traditional antihypertensive medications, which can have side effects and lead to drug dependence. Thus, cucumber juice presents a promising, accessible, and affordable option for managing hypertension, especially in the elderly.

Conclusion

After a three-day implementation period, the patient's blood pressure improved significantly. Initially recorded at 160/90 mmHg, the blood pressure measured on the third day was 150/80 mmHg following the administration of cucumber juice. This reduction highlights the effectiveness of cucumber juice in lowering blood pressure. To maintain these positive results, it is crucial to educate patients on the ongoing benefits of incorporating cucumber juice into their diet. For future research, several recommendations can enhance our understanding of cucumber juice's role in hypertension management. First, studies should involve larger and more diverse populations to ensure that the results are applicable across different demographics. Additionally, investigating the long-term effects of cucumber juice consumption will provide valuable insights into its sustainability as a long-term treatment option. Comparative studies could also be beneficial, comparing cucumber juice with other natural remedies and standard antihypertensive medications to assess its relative efficacy and safety. Exploring the specific mechanisms through which cucumber juice influences blood pressure could help in refining its use and uncovering additional health benefits. Lastly, examining patient adherence to cucumber juice therapy and identifying potential barriers will be essential for improving compliance and optimizing treatment outcomes.

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