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Taylor Myers
Indiana State University

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Taylor Myers

Indiana State University

Abstract

Hypertension is a prevalent condition in the United States that often has many comorbidities. It is usually asymptomatic, so patients are less likely to comply with treatment if they feel healthy. This is a growing concern due to the complications that can arise from hypertension. Hypertension can be associated with a lower quality of life in patients that have symptoms. However, in patients that do not show symptoms they may feel that they have a higher quality of life by not changing their preexisting habits. The reasons for patient noncompliance will be studied as well as interventions to increase compliance, related health problems, and how hypertension affects the quality of life. A literature review was done in order to determine the effects of hypertension on the patients' quality of life. The majority of studies found that patient compliance does lead to a higher quality of life in hypertension patients. This is because it can prevent other health problems from arising. Also, the patients that continued their preexisting habits rated their overall quality of life higher, but their physical quality of life lower.

Keywords: hypertension, patient compliance, quality of life

Hypertension Patient Compliance

Hypertension, or high blood pressure, is an increasingly common health concern in the United States. There are many lifestyle choices that can lead to the development of hypertension. A poor diet that includes too much salt is one factor. Often, this is due to the large amounts of fast food that individuals are consuming. Also, obesity is becoming more prevalent. This may be attributed to an increase in portion size and a decrease in physical activity. This excess weight causes more of a strain on the heart and raises cholesterol levels. Smoke and even second hand smoke over a period of time can raise blood pressure as well. Drinking too much alcohol regularly can cause hypertension and raise triglycerides. Sometimes patients can lower their blood pressure on their own simply by correcting these factors. Doctors can also prescribe anti-hypertensive medications to lower it. In severe hypertension, a combination of the two is usually needed.

Patients with hypertension are often asked by their doctor to change certain aspects of their lives. This may include regular diet and exercise, reducing sodium, limiting alcohol, quitting smoking, and reducing stress. The doctor may also put them on a medication regimen. All of these things work together to lower blood pressure in the average patient. Reducing hypertension is important because it can lead to better health outcomes for the patient and possibly a better quality of life.

Even though patients are told that correcting these factors and following the medication regimen could lead to better quality of life, some choose to resume their habits. This often leads to hospital readmissions because the patients did not follow the physician's orders. This seems to be an increasing problem in the United States. This could possibly be because they do not understand the medication directions, the medication is hard for them to get and afford, or it is

difficult for them to break their habits. Whatever the reason may be, these patients do need to try and follow their doctor's orders as closely as they can to have better outcomes.

It is puzzling that patients do not comply with their hypertension treatment because of the other major health problems that it can cause. Even though hypertension causes other problems, does correcting it really lead to a better quality of life? Does changing all of the things that might make people happy really make them have a better life? The answer to these could vary between individuals. One patient may think it is worth giving up their current lifestyle for a healthier one while another patient may not see the benefits and continue with their unhealthy lifestyle.

Some of the health problems related with hypertension include artery damage, aneurysm, coronary artery disease, heart failure, and stroke. Artery damage can cause arteriosclerosis, or hardening of the arteries. High blood pressure damages the lining of the arteries that makes artery walls thick and stiff. If left untreated, it can affect blood flow. This constant pressure over time can cause a bulge in the weakened arteries, called an aneurism. This bulge can rupture and cause internal bleeding. Coronary artery disease produces a narrowing of the arteries allowing plaque and cholesterol build up on the artery walls. The coronary arteries supply blood and oxygen to the heart muscle, so whenever these become blocked it results in a heart attack. Heart failure may result over time due to the constant strain on the heart caused by hypertension. Also, hypertension can lead to stroke by damaging the brain's blood vessels causing them to narrow. A clot can form as well, blocking blood flow. These are all very serious problems that could be prevented by some lifestyle changes and medication. However, some patients do not choose to follow their directions. Some patients may choose to continue their lifestyle and manage the problems as they come while others choose to embrace the changes for a healthier life. Managing

the hypertension should lead to a higher quality of life, but the patients that choose not to change may have their own reasons.

Although it is known that hypertensive patient compliance leads to better health outcomes, it is unknown if patients have a higher quality of life from their own perspective, thus I propose see if patient compliance leads to a higher quality of life. To determine this, there are several points that need to be examined. These include: factors that lead to noncompliance, relation to a higher quality of life, interventions to implement to enhance compliance, and health related problems.

What are some factors that lead to noncompliance in hypertensive patients? Some patients may not be able to afford the medications they need to decrease their blood pressure. They may not have adequate health insurance or income. Also, it costs significantly more to eat healthy as opposed to processed foods with high concentrations of salt. Another reason may be due to a lack of patient education on the doctor's or nurse's part. If hypertension isn't thoroughly explained to them, they might not comprehend the changes they need to make. These factors may be a cause for some of the patient noncompliance.

How does compliance in hypertensive patients relate to a higher quality of life? Noncompliance may lead to other, more severe health issues. By complying with their doctor's orders, they may end up having a longer life than if they hadn't complied. By choosing a better lifestyle and taking their medications, they can reduce their blood pressure and avoid the associated health problems.

What interventions can be implemented in order to enhance compliance in hypertensive patients? Doctors and nurses need to take the extra time with these patients to thoroughly inform them on the changes they need to make. The patients will be less likely to comply with their

medications and lifestyle changes if they do not understand them. They could also find a support system that can help them whenever they need it. There are different forms of support groups, and there may be groups in certain areas that deal with hypertension. Also, if they end up in the hospital, they could have an educator or dietician consult in order to teach them more about the disease and how to correct it.

What related health problems can hypertension cause if patients are noncompliant? There is a vast array of health problems associated with hypertension. These problems are severe enough that they can lead to death if there is not an early enough intervention. They include heart failure, stroke, and several other preventable problems.

To investigate these questions, there will be a literature review of studies that includes factors related to noncompliance, interventions to enhance compliance, and related health problems. Data associated with the reasons for patient noncompliance will also be included. Articles will be included in order to answer the question of whether or not patient compliance leads to a higher quality of life.

In summary, hypertension is a condition that can easily be treated with proper compliance. However, many patients do not comply as they should. There are various reasons for this that will be detailed later on. Certain lifestyle choices can be changed and medications taken in order to treat high blood pressure. In health aspects, patient compliance should lead to a better quality of life. Patients choose not to comply though, so it is a question of their perspective. Do they think that they have a higher quality of life by living as they choose or following the treatment and living without health problems? The chosen articles should piece together the reasons that patients do not comply and find an answer to whether or not the patient thinks that they will have a higher quality of life by complying with their medical care.

Research Questions

After a literature review, answers to the four research questions were found. This includes reasons for noncompliance, relation to higher quality of life, interventions, and comorbidities. According to Kear (2015), managing patients with hypertension can be multifaceted and include the patient, healthcare provider, friends and family. It is important for the patient to have a support system in order to follow the new medication regimen along with the diet and exercise changes involved. The Center for Disease Control and Prevention (CDC) shows an estimate of 16 million Americans are taking medications for their hypertension and are aware of it, but do not have it controlled (Kear, 2015). Many Americans may know that hypertension means high blood pressure. However, it is defined as a systolic blood pressure greater than 140 and a diastolic pressure greater than 90 (Hinkle & Cheever, 2014).

Related Health Issues

Hypertension can directly and indirectly lead to a vast array of other health issues. Hypertension is ranked as the third highest risk factor for disease burden according to the World Health Organization (Kear, 2015). This cardiovascular risk factor has a high morbidity and mortality rate. If a patient is diagnosed with hypertension, they require a full examination to find associated risk factors, assess organ damage, and find comorbidities (Bunker, 2014). If a patient has diabetes, a family history of hypertension, or high cholesterol, their cardiovascular risk increases. Excess salt intake, obesity, alcohol consumption, and stress can all raise blood pressure (Bunker, 2014). Hypertension is known to cause other health conditions.

Multiple tests may be done to assess for comorbidities of hypertension. These include: urinalysis, blood samples, lipid blood test, fasting blood glucose, and an electrocardiogram (Bunker, 2014). These tests are done to see if the patient has any other disorder that can be

associated with hypertension. Heart attack, stroke, aneurysm, heart failure, weakened blood vessels in the kidneys, metabolic syndrome, and trouble with memory or understanding can be a result of hypertension (High Blood Pressure, 2015). Heart attack and stroke can result due to high blood pressure hardening the arteries. It can also weaken the blood vessels and cause them to bulge, forming an aneurysm which can be life-threatening if it ruptures. An aneurysm is characterized by a localized sac formed at a weak part of the artery wall (Hinkle & Cheever, 2014). Whenever the blood has to pump against the high pressure in the vessels, it weakens the heart muscles. It eventually has a hard time pumping enough to meet the body's needs which leads to heart failure (High Blood Pressure, 2015). Heart failure is a syndrome where the ability of the ventricles to fill and eject blood is impaired (Hinkle & Cheever, 2014). This results in decreased perfusion to the body, reducing the amount of oxygen and nutrients getting to the extremities. Hypertension can also weaken and narrow blood vessels in the kidneys which can cause the kidneys to not function properly. Finally, it can also affect the patient's ability to think and learn (High Blood Pressure, 2015). Patients that have hypertension often have a difficult time with memory and understanding.

These comorbidities of hypertension stress why it is so important to manage hypertension before they arise. Whenever hypertension is managed properly, these problems can be prevented. Once a patient develops these diseases, it is much more difficult to manage. This is why it should try to be prevented earlier on.

Noncompliance

With hypertension, there are a number of factors that can cause a patient to be noncompliant. Compliance is characterized by the patient's behavior with the medication regimen, changes in lifestyle, and attendance to appointments that coincides with the advice from

their physician (Dosse, Cesarino, Martin, & Castedo, 2009). The patient should agree with the recommendations and be aware of their treatment to participate in their medical decisions. Their compliance can be assessed by their attendance to appointments, and their behavior when discussing their medications and lifestyle changes (Dosse, et al., 2009). Medication noncompliance is a major concern and has been challenging physicians. Even with efforts to improve compliance, noncompliance still seems to be an issue (Hassan, Hasanah, Foong, Naing, Awang, Ismail, & ... Rahman, 2006). Whenever medications are not taken correctly, or interventions are not maintained, the physician's effort is wasted. Noncompliance can impair quality of life for the patient, and cause further complications (Hassan, et al., 2006).

Hassan et al., 2006, discusses many reasons for noncompliance:

Studies have suggested that age, sex, lower socioeconomic status, severity of disease, drug choice, number of medications prescribed, drug tolerability, regimen complexity, co-morbid medical conditions, family support, self-efficacy, intention to comply, physician-patient relationship, satisfaction with health care and depression are associated with compliance.

Factors that affect noncompliance vary from patient to patient and in different regions.

Identifying the factors that affects a patient's compliance is critical in the planning and interventions of their treatment (Hassan, et al., 2006).

According to Dosse, et al., 2009, there is a large benefit for the hypertensive patients to attend their appointments regularly. This allows the physician to monitor for side effects and adjust the therapy to reduce them. Reduction of the side effects could increase compliance, since patients are less likely to take their medications if these medications make the patient feel ill.

Attending appointments regularly also allows the patient to change their life style more effectively and reduce stress and anxiety.

Some other factors that affect patient compliance include advanced age, gender, attendance, and behavior regarding the use of medication (Dosse, et al., 2009). The patients' medication regimen is a major factor in their compliance because most physicians combine therapy of anti-hypertensive medications. This can be more difficult for the patient to follow because these medications are not available in a single pill. The patient then has to remember to take a couple different medications and keep them in order. According to Hassan, et al., 2006, a medication barrier was found in the study because a complex regimen, effectiveness, and cost were inversely associated with compliance. The study also found that multiple drugs used in treatment was inversely associated with compliance.

The results of the study by Hassan, et al., 2006, included:

In conclusion, younger age, poor patient satisfaction and medication barrier (complex regime, cost, effectiveness) were identified as psychosocial predictors of medication noncompliance in hypertensive patients. Identification of multiple factors that predict noncompliance will allow healthcare providers to plan and implement various intervention strategies to improve medication compliance.

By identifying these factors that affect noncompliance, the physician can better detail the plan of care to include specific interventions to help with their treatment.

Interventions

There are several interventions that can be implemented in order to raise patient compliance. Some interventions would include: self-management, diet and exercise logs, home blood pressure monitoring (HBPM), patient education on medications. These interventions all

come from numerous studies that have showed an increase in patient compliance when used. If these interventions were implemented in conjunction as standard practice, the compliance rate may be able to come up further.

Self-management can include a patient-reported outcome, or a statement of how they think their condition is based on their own evaluation. According to Kear (2015), the definition of a patient-reported outcome is a report of a patient's condition from the patient without input from a physician or any medical staff. This can help the patient to be aware of their current health status which can help them be aware of their treatment.

Keeping a diet and exercise log could also be effective to increase awareness of their health status. By being aware of the energy they are expending and taking in, they may be in a better position to make the correct choices. With making healthier food choices, there should be a considerable decrease in the amount of sodium being consumed. Reduced sodium is known to cause a reduction in both diastolic and systolic blood pressures (Chen, Fuentes, Gu, He, Gu, Kelly, ... Rice, 2015). It is a common fact that it is a good idea to reduce sodium, however, it is best to write down the amount to better keep track. The Dietary Approaches to Stop Hypertension (DASH) diet is a commonly known diet used for patients with hypertension. It recommends that one consume up to 2,300 milligrams of sodium per day (Nutrition and healthy eating, 2015). The foods recommended by the DASH diet are already low in sodium, but it can be reduced more in some other ways. Sodium free spices can be used with cooking instead of salt, rinsing canned food, avoid adding salt when cooking, and buy foods with low sodium (Nutrition and healthy eating, 2015). These strategies can gradually be incorporated into the diet in order to decrease the amount of sodium.

There are some strategies to implement in order to get started with the diet and exercise needed to help lower blood pressure. These strategies include a gradual change, rewarding successes and forgiving slip-ups, adding physical activity, and getting support if one needs it (Nutrition and healthy eating, 2015). All of these are useful strategies to include along with keeping a diet and exercise log to help keep track of the energy coming in and the energy being expended. When a patient is aware of this, it makes it easier to make it a life style change.

To better keep track of how their treatment is working, and keep it managed, it is recommended that the patient take their own blood pressure at home. These monitors are reasonable and readily available. Also, a prescription is not needed to purchase one (High Blood Pressure, 2015). This shouldn't be a replacement for doctor's appointments, but used as a tool to keep blood pressure down. Home blood pressure monitoring can help improve adherence to treatment, and it can be used in a log to give to the physician. It allows for an ongoing monitoring by the actual patient that gives them direct feedback regarding their hypertension (Imai, Hosaka, Elnagar, & Satoh, 2013). It allows the physician to accurate data in order to give the patient feedback regarding their treatment plan (Imai, et al., 2013). Also, it can be used as a tool in identifying white-coat hypertension, which is when a patient's blood pressure raises at appointments due to nerves. However, there is one problem that can be associated with home blood pressure monitoring. Patients may select low or high values to report to their provider instead of all the values. This could lead to under titration or over titration of blood pressure medications (Imai, et al., 2013). The best way to combat this problem would be to instruct the patient to get a blood pressure cuff with a memory circuit, so the physician can see every value in order to provide an accurate dose of medication.

A final intervention to increase patient compliance would be patient education on the medications. If they know what their medications are for, they could be more likely to take them as prescribed. There are several types of medications used to control hypertension. These include thiazide diuretics, Angiotensin-converting enzyme (ACE) inhibitors, Angiotensin II receptor blockers (ARBs), calcium channel blockers, and beta blockers.

Thiazide diuretics are usually first line medications and can be used in combination with other medications (High Blood Pressure, 2015). An example of a thiazide diuretic is hydrochlorothiazide. Thiazide diuretics work by excreting water and sodium from the body to reduce blood volume, which reduces blood pressure (Kizior & Hodgson, 2015). ACE inhibitors act by blocking a chemical that narrows vessels, which relaxes the vessels and helps to decrease blood pressure. ACE inhibitors are a good medication for patients with chronic kidney disease (High Blood Pressure, 2015). ARBs also act to relax the blood vessels and reduce hypertension. Calcium channel blockers can relax the blood vessels and some slow the heart rate. This class of medication is a better option for older patients and can interact with grapefruit juice, which decreases its effectiveness.

Self-management, diet and exercise logs, home blood pressure monitoring, and patient education of medications can be integrated into the overall treatment of hypertension. These interventions can be simple and help the patient be aware of what is happening in their treatment. All of these interventions, when implemented in combination, could help to increase patient compliance with hypertensive treatment.

Quality of Life

The overall quality of life of patients with hypertension can significantly improve if they follow the advice and medication regimen of their physician. However, these patients might not

agree whenever they have to change several things in their life in order to reduce hypertension. This is what leads to noncompliance. From their perspective, their quality of life is better whenever they live how they choose.

The World Health Organization defines health related quality of life as a combination of mental, physical, and social well-being defined by the patient, not just the absence of a disease (Soni, Porter, Lash, & Mark, 2011). Quality of life focuses on how the patient is able to function in aspects of their lives. Whenever a patient is noncompliant, it can decrease their quality of life and worsen the condition (Hassan, Hasanah, Naing, & Rahman, 2006). Hypertension can lower the quality of life due to complications, such as the other health problems it causes.

When it comes to physical function, hypertension is often associated with a lower quality of life (Soni, et al., 2011). The best way to increase the quality of life in these patients is to prevent the complications of hypertension including chronic kidney disease and cerebrovascular disease. Overall, patient satisfaction with treatment and quality of life is better in compliant patients (Hassan, Hasanah, Naing, & Rahman, 2006).

Conclusion

The original purpose was to see if hypertensive patient compliance leads to a higher quality of life. This research was done, because many patients in the hospital come back several times for exacerbations of hypertension. This is a very common situation that could be prevented by complying to the treatment. Hypertension is known to cause various health conditions that lead to the hospitalizations. It is a disease with a high morbidity and mortality rate. This is why it is so imperative that compliance to treatment is increased.

Healthcare professionals may become frustrated whenever patients return to the hospital several times for the same problem. However, there is more that they can do themselves to help

prevent this from happening. There were several interventions found in this research that the nurses and physicians could introduce to the patients in order to help them stick with their treatment.

The original research questions were which factors lead to noncompliance, what are the related health problems, what interventions can be implemented, and how does compliance lead to a better quality of life? Most of the research questions held up besides how compliance leads to a better quality of life. There was a lot of information found for the other research questions. However, there was not much information on how it leads to a better quality of life.

There are several factors found that lead to noncompliance. Factors vary from patient to patient, but some major factors include: lower socioeconomic status, complexity of drug regimen, age, and behavior about their hypertension. It was found that patients that are more likely to attend their appointments are more likely to comply with their treatment. This is because their doctor is able to monitor their behavior and side effects of medication to adjust accordingly. Allowing for the adjustments with the medication can result in the patient following their medication regimen.

Various health problems were found that are associated with hypertension. These include: heart attack, stroke, aneurysm, heart failure, weakened blood vessels in the kidneys, metabolic syndrome, and trouble with memory or understanding (High Blood Pressure, 2015). All of these conditions that can be caused by hypertension are the conditions that usually result in repeated hospitalizations. If they were controlled, the number of hospitalizations could be decreased.

Many interventions can also be implemented in order to improve compliance. These include: self-management, diet and exercise logs, home blood pressure monitoring, and patient education on medications. All of these interventions help to increase compliance by keeping the

patient active in their treatment. They allow for the patient to be involved and aware of their current status.

There was not as much information found for how compliance leads to a higher quality of life as there was for the other research questions. Patients rated their quality of life higher whenever they chose to keep their preexisting habits. However, when it came to physical health, their quality of life was rated lower (Soni, et al., 2011). The best way to increase their overall quality of life would be to control their hypertension in order to prevent new problems from forming.

Overall, with the help of these interventions, quality of life in hypertension patients can be improved. If these interventions are implemented, they would be able to better control and monitor their hypertension. These findings would be beneficial for offices and hospitals. They could be beneficial for both, because they could help introduce these interventions to patients to prevent further hospitalizations.

In the offices, they could teach them the associated health problems if it is not controlled, teach them about their medications, and address any possible reason that the specific patient may not be able to comply. This is a good opportunity in the offices, because they are not having a current exacerbation. Whenever patients attend appointments regularly, they are in a good position to be receptive to what the physician is telling them.

In the hospitals, the nurse would have a great opportunity to do in depth teaching with the patient. They may also be receptive, because they do not want to return to the hospital. The nurse spends a large amount of time with these patients, so they have an opportunity to do some teaching about the interventions. The physicians can also reiterate what the nurses are teaching

whenever they come in to do their rounds with the patients. This is a good opportunity for the nurse and physician to build rapport with the patient.

It was found that patient compliance does lead to a better overall quality of life in hypertension patients. This is because it can reduce the overall hospitalizations and prevent further health issues from arising. If the patient can attend regular appointments, be receptive to the education, and be active in their treatment, they can comply with their physician's orders. Overall, this will help to improve their quality of life.

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