The Role of Cognitive Behavior Therapy in Fighting Non-adherence to Medical Advice Maintained by Fear of Drug Side-effects in a Man with Cholesterol, Obesity and Hypertension Problems

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Citation

Abstract
The case study describes a man with cholesterol, obesity and hypertension problems. His walking and dieting schemes alone were unable to reduce his excessive weight and bad cholesterol. He initially rejected the doctor’s advice to take cholesterol medication on suspicion it was harmful. Literature indicates that fear of medicine side-effects is one of the major reasons many patients do not adhere to drug therapy. Following an eclectic counseling program, the participant successfully disputed and eradicated his irrational and illogical fears of cholesterol medication and used it. In addition, the enlistment of his family members in the treatment program as onlookers further helped him to comply with the drug, exercise and diet regimens. Bad cholesterol was lowered and obesity downgraded to overweight. Maintenance of these gains during the follow-up phase suggested an increase in his self-efficacy for self-care. He was still vulnerable and at risk of developing heart disease and stroke.

INTRODUCTION
In the present study, adherence to medical advice is defined as conformity or compliance with the doctor’s suggestions or prescriptions whereas non-adherence is a negative connotation denoting lack of cooperation with the physician’s explanations. Thus non-adherence is a barrier to medication. Both adherence and non-adherence to medical advice are measured in similar ways. Among the many strategies used to assess these dispositions, four stand out: self-reports; biochemical tests; pill and bottle counts; and interviews. A variety of self-report questionnaires (scales or inventories) have been developed to assess adherence and non-adherence. They include the Brief Medication Questionnaire 1, BMQ 1 (1) and the Resistance to Treatment Questionnaire (2). Unfortunately, these and other self-reports tend to have reliability, validity, and social desirability problems. Physiological tests or assays of blood, urine and stool are also widely used. Though reliable and valid, these procedures are expensive and require high-level clinical knowledge and technical skills to use them efficiently. Despite being easy to use, pill and bottle counts are usually not reliable and valid unless carried out under strict observation. Interviews, on the other hand, are beset with problems of interviewer effects and social desirability. They have low reliability and validity.

There are many possible reasons why people do not adhere to medical advice including the following examples:

DIFFERENCES BETWEEN ADHERENCE AND NON-ADHERENCE TO MEDICAL ADVICE
Adherence is conceptualized as the active and voluntary involvement of the patient in the management of their disease or mental health problem by following a mutually agreed course of treatment and sharing responsibility between the patient and health care providers.

Thus adherence or compliance is the extent to which a patient acts in accordance with the prescribed instructions for medical dose or therapeutic regimen within a specified time interval. The unit of measurement for adherence/compliance is administered doses or behavioral actions per defined period of time, reported as a proportion or percentage. It is mathematically represented in the formula that is shown below. There is no justified cut-off
although 80% has been arbitrarily used in the literature.

Medication compliance = \( \frac{\text{Number of prescribed doses taken in the specific time interval}}{\text{Overall total number of prescribed doses in the specific time interval}} \times 100 \)

Non-adherence to treatment is often assumed to be omission of prescribed drug doses or therapeutic actions. In reality, both overuse (overdose) or underuse of medication and therapeutic regimen represent non-adherence to treatment plan. The terms ‘non-compliance’ and ‘non-adherence’ have been used interchangeably in literature. However, non-compliance implies a negative judgment on patients or clients. In view of this, the term ‘non-adherence’ has been adopted for use in the present study. A recent study found that non-adherence to medication prescriptions in Brunei diabetic patients was a big problem and source of concern. This study obtained the following prevalence statistics for non-adherence to medical advice in the Brunei diabetic sample: medications, 14%; diet recommendations, 45%; and physical activity, 76%. Non-adherence to medication or therapy advice complicates and worsens a person’s health. It creates additional problems such as more sickness and deterioration, more use of medical drugs and medical facilities, and high cost of maintaining good health. In short, non-adherence to medical advice puts a patient or client in a risky and vulnerable position.

**CONNECTIONS BETWEEN CHOLESTEROL, DIET AND HEALTH**

Cholesterol is a waxy, fat-like substance in the body. It is needed to carry fats to various parts of the body. The liver produces 80% of cholesterol, 20% comes from food. After eating, fat passes to the intestine where it is absorbed and sent to the liver for processing. The liver loads fat in very low-density lipoproteins (VLDLs) that transport fat to other parts of the body. After delivering the fat, the unloaded VLDLs become low-density lipoproteins (LDLs) that are known as bad cholesterol. Some LDLs stick to the blood vessel walls when returning to the liver. High-density lipoproteins (HDLs), known as good cholesterol, find these stuck LDLs and bring them to the liver to be processed. Another type of fat in the blood, called triglycerides, can also affect an individual’s health. Altogether, these three types of cholesterol (LDL, HDL, and triglycerides) make up the so-called total cholesterol count, which can be determined through a blood test. Each of these is briefly described below. Cholesterol levels reflect the amount of fat being carried through a person’s blood by different lipoproteins. These numbers are used as a measure to predict a person’s risk for heart disease. The total cholesterol number is not as important as the figures for each of the components: LDLs, HDLs and triglycerides.

**LDL (BAD) CHOLESTEROL**

When too much LDL (bad) cholesterol circulates in the blood, it can slowly build up in the inner walls of the arteries that feed the heart and brain. Together with other substances, it can form plaque, a thick, hard deposit that can narrow the arteries and make them less flexible, condition medically known as atherosclerosis and which is a risk factor for coronary artery disease (CAD). If a clot forms, and blocks a narrowed artery, heart attack or stroke can result. LDL (low-density lipoprotein) cholesterol is thought to be “bad” cholesterol because it carries mostly fat and only a small amount of protein from the liver to other parts of the body. People who have at least a moderate risk for developing heart disease (especially those who have diabetes) may benefit from lowering their LDL cholesterol levels. The specific target LDL level depends on a person’s number and type of risk factors.

**HDL (GOOD) CHOLESTEROL**

HDL (high-density lipoprotein) is sometimes called “good” cholesterol, because it helps move LDL (bad) cholesterol out of the body. HDL does this by binding with bad cholesterol in the bloodstream and carrying it back to the liver for reprocessing and disposal. Thus high-density lipoproteins (HDLs) are considered to be beneficial since they sweep the blood of excess fat and bad cholesterol. Put in an alternative way, HDL reduces, reuses, and recycles LDL cholesterol by transporting it to the liver where it can be reprocessed. It can thus be argued that HDL cholesterol acts as a maintenance crew for the inner walls of blood vessels (endothelium). Damage to the endothelium is the first step in the process of atherosclerosis, which causes heart attacks and strokes. HDL chemically scrubs the endothelium clean and keeps it healthy. As a result, a high HDL level is linked to a lower risk of heart disease.

**THE TRIGLYCERIDES**

Triglycerides are a form of fat made in the body and found in the blood. They are the most common type of fat and are a major source of energy. When a person eats, his or her body uses the calories it needs for quick energy. It converts excess calories into triglycerides and stores them in fat cells to use later. In normal amounts, triglycerides are very important to
good health. But having high triglyceride levels may increase a person's risk of developing coronary artery disease (CAD). Very high triglycerides may lead to pancreatitis in certain people. Elevated triglycerides can be due to overweight/obesity, physical inactivity, cigarette smoking, excess alcohol consumption and a diet very high in carbohydrates (60 percent of total calories or more). People with high triglycerides often have a high total cholesterol level, including a high LDL (bad) level and a low HDL (good) level. Many people with heart disease and/or diabetes also have high triglyceride levels.

**LINKS BETWEEN WEIGHT, OBESITY AND HEALTH**

Weight has always been used as an indicator of health. There seems to be no problems with average weight for each specific age and height for any group of individuals. In infants, however, low birth weight (weight less than the average 3 Kg at birth) may be an indication that the head and the brain matter in it might not have developed and grown optimally prior to birth. According to developmental psychologists (4), low birth weight might partly be attributed to the carrying mother (pregnant woman) not eating enough nutritious food during pregnancy for her and the fetus. Research in developmental psychology (4) suggests that both low birth weight and underweight during early childhood (due mainly to malnutrition) have implications for low IQ in childhood stage of development and growth. During adolescence and adulthood, maintenance of a normal weight for a specific age and height continues to be a challenging problem. Too many factors affect the weight of a person during these two developmental stages. Again, the two major problems here are underweight and overweight (like during childhood). The principal causal factors are malnutrition (not eating enough healthy foods), eating disorders (e.g. anorexia nervosa and bulimia nervosa), and addictions to eating (uncontrolled eating or chronic overeating). Due to brevity considerations, a detailed explanation of all these three central factors is unfortunately outside both the scope and objectives of the present study. Of the two weight-linked problems (under-and-over weight), the most difficult to address and which affects most people is overweight (also known as excessive weight or obesity).

Obesity is defined as being 20 percent or more above one's desirable weight range. It is a medical condition that refers mainly to storage of excess body fat. The human body naturally stores fat tissue under the skin and around organs and joints. Fat is critical for good health because it is a source of energy when the body lacks natural energy necessary to sustain life processes, and it provides insulation and protection for internal organs. But the accumulation of too much fat in the body is associated with a variety of health problems. Obesity is partially determined by a person's genetic makeup. If a child inherited the excessive body fat cells of his obese parents, more likely, she/he will tend to eat more than her/his body needs; thus, making her/him an obese person too. Copying poor eating habits of parents also affects a child's body weight. Lifestyles (e.g. devoting less time for exercise and other physical activities) also play a key role in triggering obesity. Similarly, it is also unhealthy doing untiring recreational activities such as browsing the internet, video games, movies, and television, plus using laborsaving devices of the modern living, such as personal computers, telephones, and remote controls, promote an inactive lifestyle.

The Body Mass Index (BMI) is a number calculated from a person's weight and height and used to determine if a person's weight is healthy for her/his height. BMI is a fairly reliable indicator of body fatness for most people. However, BMI does not measure body fat directly, but research has shown that BMI correlates to direct measures of body fat such as underwater weighing. Additionally, BMI is an inexpensive and easy-to-perform method of screening for weight categories that may lead to health problems (e.g. obesity) in adults. However, BMI is not in itself a diagnostic tool. For example, to determine if excess weight is a health risk, a healthcare provider would need to perform further assessments. These assessments might include skin-fold thickness measurements, evaluations of diet, physical activity, family history, and other appropriate health screenings. The use of BMI allows clinicians and people to compare their own weight status to that of the general population.

**CONSEQUENCES AND RISK FACTORS ASSOCIATED WITH CHOLESTEROL AND OBESITY**

Cholesterol is essential to a person’s health but too much of it can be harmful. There are many ways problems may develop from high cholesterol. In children and young adults, arteries are open and have smooth lining. With time, fat and other materials can collect on artery walls, forming plaque. As plaque continues to collect and build on, artery walls thicken and lose their elasticity. This condition, which
narrowed the passage for blood in the arteries, is called atherosclerosis (thickening and loss of elasticity of the arterial walls). It severely disrupts blood flow which may eventually stop completely when an artery is blocked. Coronary heart disease (CHD) may occur when plaque formation affects the blood vessels to the heart. If plaque blocks an artery that supplies blood to the heart, a heart attack might occur. When plaque blocks an artery that supplies blood and oxygen to the brain, a stroke may occur. In addition, angina may also occur due to a reduction in blood and oxygen supply to the heart muscles. Other risk factors for heart disease include high blood pressure, diabetes, cigarette smoking, obesity (excess weight), and a positive family history of heart disease.

According to the World Health Organization (WHO) BMI weight status categories, anyone with a BMI over 25 would be classified as overweight and anyone with a BMI over 30 would be classified as obese (5). Because BMI is not a direct measure of body fatness, it is quite possible that some individuals may have a high BMI but not have a high percentage of body fat. For example, highly trained athletes may have a high BMI because of increased muscularity rather than increased body fatness. Most people with a BMI in the obese range (equal to or greater than 30) will have increased levels of body fatness (a risk factor for heart disease). The BMI ranges or categories are based on the relationship between body weight and disease and death. A physician will be able to determine whether a person can manage her/his weight condition with diet and exercise alone or whether to include medication. In general, overweight and obese individuals are at increased risk for many diseases and health conditions including the following:

The social and psychological problems experienced by obese people are also challenging. Discrimination for “fat” people is most likely to occur in educational institutions, employment, and social relationships. Other psychological effects include stress, nervous tension, boredom, frustration, lack of friends, depression, inferiority complex, and poor self-esteem.

THE PRESENT STUDY

The present study focused on one middle aged man who had problems with high cholesterol levels, overweight and hypertension. Of these three concerns, the investigation addressed only the cholesterol and overweight problems. The man had no problems with high blood pressure (HBP) medication given to him and he took it regularly as prescribed. This controlled and stabilized the man’s hypertension condition. Central to the intervention were three main issues: what was the main problem? Why was the problem persisting? and how could the problem be resolved? Although the man was under drug therapy for cholesterol, he (privately without telling the doctor) refused to take the medication (atorvastatin) for fear that it had dangerous side-effects. He lied to the doctor that he was taking the medication and yet not. Meanwhile, he alleged to other people that a friend of him who died due to heart complications had claimed and told him before death that his condition was aggravated by this same cholesterol medication (atorvastatin) prescribed for him by a doctor in the hospital to reduce his bad cholesterol. There was no medical evidence to support the allegation. As a result, the pharmacotherapy intervention had no effect on the man’s cholesterol levels. Noticing no change to the cholesterol levels and not knowing the reason why, the doctor increased the cholesterol dosage from 10mg/per day to 30mg/per day but there was still no change again despite the increased dosage because the medication was not taken or used by the patient. Eventually the doctor gave up and withdrew the cholesterol medication from the intervention. Due to the ever rising cholesterol levels, the doctor reinstated the same medication again but this time he enlisted the help of the family members (wife and daughter) to help supervise or monitor the man in taking the medication. In addition, the doctor also suspected that the patient was probably not taking the medication for reasons best known to himself. He referred the man for counseling to help dispel his irrational fears of taking cholesterol medicine and to assist him to follow prescribed diet and exercise plans. The present study explains how the counseling intervention was conducted and what it achieved.

OBJECTIVES OF THE STUDY

Based on the non-adherence problem described immediately above, the present study had the following three objectives:

METHOD

The mixed-methods study (that employed the case study and experimental approaches) used the single case pretest-posttest intervention design. The rationale and justification for adopting the dual procedure was five-fold. First, the design was intended to help the researcher to determine the extent to which an eclectic CBT counseling program could:

(a) reduce the client’s irrational fears of the medicine’s side-effects in a pharmacotherapy context; (b) encourage the
patient to follow a healthy diet and strictly control urges or cravings for overeating; and (c) empower the client to undertake a prescribed physiotherapy (30-minute walk each day). Second, this mixed methods research strategy (which required moving from medical case study to counseling experimental inquiry) was common in health sciences research where an individual can either volunteer or be referred to be in both medical and psychotherapy regimens. Given these circumstances, the only criterion for inclusion into the present case study was that a patient was referred to the researcher (who was a practising psychologist/counselor) and that the client’s profiled information appeared to be unusual from that of the normal or majority. Third, the study method prevents the problem from spreading and growing to unmanageable proportions and brings immediate attention to persons with presenting problems. Fourth, the researcher wanted to have a long and careful observation of the client as well as make an in-depth analysis and further interpretation of the data collected from the participant. Fifth, while the results of a case study with a single participant, such as the present inquiry, were only exploratory rather than confirmatory, the findings may provide useful research questions and hypotheses for further follow-up research studies.

**PARTICIPANT**

As stated above under the section headed “the present study”, the participant in the present study was a male tertiary student aged 41 from one of the four universities in Brunei. The universities in Brunei have both local and international students. He was referred to the researcher (who was a practising psychologist/counselor) for professional help to deal with his cholesterol and weight problems. In this way, the man included in the case study was not obtained incidentally or conveniently but rather systematically and purposively. For ethical reasons, however, and in accordance with Brunei personal information protection laws, his real name, occupation, nationality, religion, ethnicity and other personal identifying information are withheld and kept both anonymous and confidential. Throughout this study, the participant is given a pseudonym whose shortened (abbreviated or coded) version is AMK. He is referred to by this fake name throughout the article. As described above, the participant’s two main problems were non-adherence to: (a) cholesterol medication; and (b) weight-reduction regimens. Like elsewhere in the world, recent research has shown that tertiary students in Brunei also have all kinds of psychological distress (6,7,8). However, some of the strategies that they use to resolve difficulties and cope with psychological problems do not appear to work satisfactorily (9). This then necessitates the need for professional help in some cases.

**INTERVENTION**

From the intake interview, it became apparent that the critical condition, nature and degree of AMK’s health required performing concurrently four distinct interventions, namely: (a) an eclectic CBT program – facilitated by the psychologist/counselor; (b) drug therapy – observed by wife and daughter; (c) exercise therapy – observed by wife and daughter; and (d) diet regimen – observed by wife and daughter. During the intake interview, AMK was informed of the need to conduct simultaneously all these four interventions including involving his family members (wife and daughter) as observers in three of them. AMK agreed and promised to cooperate with all parties concerned. His wife and daughter were included in the study for three main reasons. First, they were tasked with the responsibility of monitoring the extent to which the participant was complying in taking the cholesterol medicine. Second, as people who prepared most meals in the family, they needed to have first-hand information about any diet changes required to help resolve AMK’s health problems. Third, they were requested to help AMK remember to take his cholesterol and HBP medicines on time every evening. What transpired and the specific techniques and strategies that were used in each intervention are briefly described below.

**COGNITIVE-BEHAVIOR THERAPY**

To reduce AMK’s fear of taking cholesterol medicine, an eclectic cognitive behavior therapy (CBT) approach that incorporated elements of rational emotive behavior therapy, REBT (10), cognitive restructuring therapy, CRT (11), and self-instructional therapy, SIT (12), was used. According to REBT, what clients think about a particular fact or experience determines how they feel and what they do (13). George and Critiani point out that the focus of REBT intervention is on replacing irrational or illogical thinking with logical thinking through education or training. AMK’s non-adherence to medication fitted Ellis’s ABCD model of intervention. In this approach, the A (activating/antecedent event) represented AMK’s recurring memories and thoughts of the friend who died of heart complications “supposedly due to side-effects of the cholesterol medicine”. The B signified AMK’s beliefs regarding the dangers of taking cholesterol medicine. AMK was aware of the consequences...
The role of the psychologist was to help AMK to dispute (D) his self-defeating irrational and illogical beliefs and fears of taking cholesterol medication and replace them with more realistic alternatives. AMK was given a research task to go to the main hospital in Bandar Seri Begawan (capital of Brunei Darussalam) to obtain statistical data about the number of outpatients who collect cholesterol medicine monthly, duration of drug consumption, and the number who have died from the medicine’s side effects. He was surprised to find out that many people take cholesterol medicine and yet they do not die. In addition, he found out that for a few people who experienced side effects, their doctor often changed either the dosage or the type of medication to address the problem. AMK was asked to repeat this research exercise with data from a private hospital in the capital and the results were strikingly the same. A discussion of the two research outcomes with the therapist in the sessions helped AMK to begin restructuring his cognitions ([1]) about the medicine’s side effects and he gradually started changing his negative thoughts, feelings and beliefs (TFBs) about the medicine. With these gains, the therapist now focused on training AMK the self-instructional skills of replacing negative TFBs with positive ones in the subsequent sessions ([2]). An activity that the therapist gave to AMK was to compile a list of reasons why many people do not die from taking cholesterol medicine. AMK composed a number of self-instructional statements such as: (1) cholesterol medicine does not have side effects on all people; (2) the severity of the side effect depends on a person’s body metabolism; and (3) compared the advantages and disadvantages of taking versus not taking cholesterol medicine. The positive effect of CBT encouraged and enabled AMK to be confident about taking cholesterol medication and paved the way for him to undergo drug therapy.

**DRUG THERAPY**

The cholesterol drug therapy was administered and supervised by a medical doctor in a hospital clinic. AMK’s wife and daughter were trained by the psychologist/counselor to carefully observe and tally his daily taking of cholesterol medication. The observational data collected during the three phases of the treatment (baseline, intervention and follow-up) were given to the psychologist for analysis and interpretation. The data were used to determine the extent to which the patient complied with medical advice as prescribed by the physician.

**EXERCISE THERAPY**

This intervention was administered and supervised by the psychologist / counselor. However, the daily responsibility of observing and tallying AMK’s compliance to the physiotherapy recommendations was delegated to the client’s wife and daughter. The two family observers received training from the psychologist on how to do this task appropriately. The movement therapy was in form of taking a 35-minute walk each day covering a total distance of 1km. Again, the observational data collected during the three phases of the treatment (baseline, intervention and follow-up) were given to the counselor for analysis and interpretation. The data were used to determine the degree to which the patient adhered to counseling advice.

**DIET REGIMEN**

This treatment was administered by the psychologist / counselor but the responsibility of ensuring that AMK followed the psychologist’s advice on buying and eating healthy foods was tasked to his wife and daughter as observers. The counselor briefed AMK and the two observers on the benefits and the significance of reaching target and desirable cholesterol levels indicated in Table 1. In addition, the psychologist also pointed out to AMK and the two family observers the consequences of failing to achieve these cholesterol levels.

**Figure 1**

Table 1: Target healthy cholesterol levels

<table>
<thead>
<tr>
<th>Cholesterol Level (mmol/L)</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 5.1*</td>
<td>Desirable</td>
</tr>
<tr>
<td>5.1 to 6.2</td>
<td>Borderline high</td>
</tr>
<tr>
<td>≥ 6.2</td>
<td>High</td>
</tr>
<tr>
<td>&lt; 1.0</td>
<td>Low</td>
</tr>
<tr>
<td>≤ 2.6*</td>
<td>Target</td>
</tr>
<tr>
<td>2.6 to 3.3</td>
<td>Near or above target</td>
</tr>
<tr>
<td>3.4 to 4.1</td>
<td>Borderline high</td>
</tr>
<tr>
<td>≥ 4.9</td>
<td>Very high</td>
</tr>
<tr>
<td>&lt; 1.7*</td>
<td>Normal</td>
</tr>
<tr>
<td>1.7 to 2.2</td>
<td>Borderline high</td>
</tr>
<tr>
<td>2.3 to 5.6</td>
<td>High</td>
</tr>
<tr>
<td>≥ 5.6</td>
<td>Very high</td>
</tr>
</tbody>
</table>

*Desirable / target level

The counselor gave further information to AMK and the two observers comparing the protein, fat, calories, iron and cholesterol in meats commonly eaten by many people in
Brunei Darussalam. This information is summarized in Table 2 below. The psychologist advised them to avoid meat products that were high in fat and cholesterol.

Figure 2

Table 2: Nutrition comparison (per 100 grams)

<table>
<thead>
<tr>
<th>Meat</th>
<th>Protein (%)</th>
<th>Fat (grams)</th>
<th>Calories (KCal)</th>
<th>Iron (mg)</th>
<th>Cholesterol (mg)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ostrich</td>
<td>25.9</td>
<td>2.8</td>
<td>149</td>
<td>3.2</td>
<td>63</td>
</tr>
<tr>
<td>Chicken</td>
<td>25.9</td>
<td>2.8</td>
<td>150</td>
<td>1.2</td>
<td>89</td>
</tr>
<tr>
<td>Beef</td>
<td>25.9</td>
<td>9.28</td>
<td>211</td>
<td>3.0</td>
<td>66</td>
</tr>
<tr>
<td>Pork*</td>
<td>25.3</td>
<td>9.66</td>
<td>212</td>
<td>1.1</td>
<td>86</td>
</tr>
<tr>
<td>Deer</td>
<td>30.2</td>
<td>3.2</td>
<td>158</td>
<td>4.5</td>
<td>112</td>
</tr>
<tr>
<td>Goat</td>
<td>No data</td>
<td>2.0</td>
<td>169</td>
<td>No data</td>
<td>57</td>
</tr>
<tr>
<td>Lamb</td>
<td>22.0</td>
<td>13.9</td>
<td>205</td>
<td>No data</td>
<td>76</td>
</tr>
<tr>
<td>Duck</td>
<td>No data</td>
<td>59.0</td>
<td>404</td>
<td>No data</td>
<td>76</td>
</tr>
</tbody>
</table>

* Muslims are not allowed to eat pork. The majority (85%) of the people in Brunei are Muslims. Only non-Muslims eat pork.

To help AMK to control his cholesterol, the counselor gave him and the two supervisors additional information summarized in Table 3. Similarly, the counselor advised AMK to avoid buying and eating foods that were high in cholesterol or saturated fats. The psychologist requested the wife and daughter to observe and tally the frequencies AMK bought and ate unhealthy foods. This information was used to determine AMK’s adherence to diet recommendations.

Figure 3

Table 3: Controlling cholesterol

- **Original ingredients** (high in cholesterol / saturated fats)
- **Substitute ingredients** (low in cholesterol / saturated fats)

<table>
<thead>
<tr>
<th>Original ingredients</th>
<th>Substitute ingredients</th>
</tr>
</thead>
<tbody>
<tr>
<td>But - animal fat</td>
<td>Soya margarine</td>
</tr>
<tr>
<td>Animal fat or coconut oil</td>
<td>Monounsaturated (canola or olive oil) or polyunsaturated (sunflower or corn oil)</td>
</tr>
<tr>
<td>Whole milk / cream / coconut milk</td>
<td>Low fat evaporated/desert milk/paghurt</td>
</tr>
<tr>
<td>Meat</td>
<td>Soybean products such as tofu</td>
</tr>
<tr>
<td>1 whole egg</td>
<td>2 egg whites</td>
</tr>
<tr>
<td>Butter</td>
<td>Corn oil</td>
</tr>
<tr>
<td>Lard</td>
<td>Soybean oil</td>
</tr>
<tr>
<td>Hard margarine</td>
<td>Peanut oil</td>
</tr>
<tr>
<td>Tallow/mutton/chicken fat</td>
<td>Olive oil</td>
</tr>
<tr>
<td>Cream</td>
<td>Palm oil</td>
</tr>
<tr>
<td>Coconut oil/coconut milk</td>
<td>Polyunsaturated margarine</td>
</tr>
<tr>
<td>Egg yolk</td>
<td>Salad cream/mayo/mayo from vegetable oil</td>
</tr>
<tr>
<td>Red meat</td>
<td>White meat (skinned chicken, fish)</td>
</tr>
</tbody>
</table>

INTERVIEWS AND SELF-REPORTS

Clinical interviews included the intake interview with the psychologist/counselor and half-year diagnostic interviews with a medical doctor (general physician, GP) at a government hospital. During the intake interview, the psychologist administered two self-reports as pretest measures. These were the Brief Medication Questionnaire 1, BMQ 1 (1) and the Resistance to Treatment Questionnaire, RTQ (2). The BMQ 1 asked about the medications the participant was taking for high blood pressure (HBP). The items have different response formats and cannot be used to yield a single total or composite score. AMK revealed taking four different types of medication for high blood pressure, namely: (a) Enalapril 20 mg/day; (b) Amlodipine 5 mg/day; (c) Indapamide SR 1.5 mg/day; and Asprin E.C. 100 mg/day. According to responses he provided on the BMQ 1, the participant took all these HBP medications regularly as prescribed. As a result, his hypertension was under control and in a stable condition throughout the intervention. The BMQ 1 was then modified or adapted to ask about the medications the client was taking for cholesterol. AMK said he was prescribed only one kind of cholesterol medicine, Atorvastatin 20 mg/day but indicated that he was reluctant to take it because of its presumed side effects.

The Resistance to Treatment Questionnaire (RTQ) is a 40-item Likert-type questionnaire which can be administered in about 10 minutes. In the present study, all the items were scored in the positive direction on 5-point nominal scales ranging from 1 Strongly Disagree (SD) through 3 Neutral (N) to 5 Strongly Agree (SA). It is capable of identifying four core reasons or themes for resistance (non-adherence or non-compliance) to medication: (a) lack of faith or dissatisfaction with the treatment or with the medical team; (b) emotional reasons; (c) specific problems or constraints; and (d) factors connected to despair and failure. The instrument was originally designed for use with diabetic patients but in the current study it was adapted to measure resistance to cholesterol medication. Overall total scale scores might range from 40-200 (Median = 100). Higher scores on the RTQ scale indicate high levels of resistance to medication.

BLOOD TESTS, WEIGHT AND HEIGHT MEASURES

Blood tests were performed in the morning after fasting from 8.00 pm the previous day. The blood was taken by trained in nurses in a clinic and analyzed by trained laboratory
technicians in a hospital. All weight and height measures were conducted by trained nurses using functioning weight machines in the clinic or hospital.

QUALITY OF THE ASSESSMENTS AND OBTAINED DATA

The reliability and validity of the various assessments used and data obtained from the present study are briefly discussed below.

(A) INTER-OBSERVER AGREEMENT PERCENTAGE RELIABILITY (IOA %)

During the three phases of the treatment (baseline, intervention and follow-up), the days were numbered from 1 to n. On each day the two observers (wife and daughter) independently rated whether they saw AMK do three daily therapeutic activities: (1) took prescribed cholesterol medicine; (2) avoided eating oily and salty foods; and (3) went on 30-minute walk. The extent to which the judges daily agreed (A) and disagreed (D) on each of these three conditions was recorded, collated, and computed in terms of the inter-observer agreement reliability percentage \[\text{IOA} = (\frac{A}{A + D}) \times 100\]. The average reliability percentages were: taking cholesterol medication every evening 95%; eating unhealthy foods 89%; and going for a walk 87%. Overall, the adherence / compliance rates were reasonably high. Watching the foods AMK ate was not always possible on occasions when family members were not in his company. The walking program had the lowest reliability percentage score because on rainy (or bad weather) days, the client was not able to do the movement activity but he often made up the shortfall the next day/opportunity by doubling either the walking time or distance. Brunei has only one equatorial climate with monsoon rains throughout the year.

(B) RELIABILITY AND VALIDITY OF SELF-REPORT INSTRUMENTS AND DATA

Both of the self-report measures used in the present study: the Brief Medication Questionnaire 1, BMQ 1 (1) and the Resistance to Treatment Questionnaire, RTQ (2) are widely used and well-established instruments. Because both have not yet been used on large respondent samples in Brunei Darussalam, their reliability and validity in the Brunei context is unknown. However, the developers of these instruments claim that the questionnaires are reliable and valid. Two psychology colleagues of the researcher who sighted these instruments indicated that the scales seem to have adequate content validity when compared to similar instruments in psychotherapy and counseling. In psychometrics, any instrument which is valid is generally also reliable, but not necessarily vice versa. According to previous research (2), high scores on the RTQ imply or suggest low self-efficacy in taking medication.

(C) RELIABILITY AND VALIDITY OF WEIGHT AND HEIGHT MEASURES AND BLOOD TESTS

Weight and height measures as well as blood pressure and blood assays were deemed reliable and valid since they were all done by specially trained biomedical technicians or nurses and interpreted clinically by registered practising general physicians (GPs) at the clinic and hospital. The machines used in collecting the measurement data were all modern instruments considered reliable.

(D) ECOLOGICAL VALIDITY

The intervention was conducted in the client’s own home, a natural habitat or environment. This home context may have encouraged the client to behave in a naturalistic way rather than in the artificial and socially desirable (defensive and cautious) manner.

(E) SOCIAL VALIDITY

The treatment was acceptable to the client’s family, community and societal norms. It involved three family members (client, wife and daughter). The wife and daughter provided observational data. The socially valid and useful treatment was done in the best interests of the client, his family and the community.

DATA ANALYSIS

In the present study, cholesterol was measured by laboratory blood tests and interpreted as explained below. The weight measures used in the computation of the body mass index (BMI) were taken at a hospital and clinic. Similarly, the blood pressure readings presented in Table 4 below were also all taken by nurses at a hospital and clinic.

Cholesterol is measured either in milligrams per deciliter of blood (mg/dL) or in millimoles per liter of blood (mmol/L). The following interpretations are used per type of cholesterol.

LDL (BAD) CHOLESTEROL

An LDL cholesterol level of less than 100 mg/dL (less than 2.6 mmol/L) is considered optimal.
HDL (GOOD) CHOLESTEROL
In general, people with high HDL are at lower risk for heart disease. People with low HDL are at higher risk. As far as possible, HDLs should be kept high (above 40 mg/dL and more than 60 mg/dL optimally) at all times.

Triglyceride levels are categorized as follows:
Below 150 milligrams per deciliter (mg/dL) is considered normal.

OVERWEIGHT OR OBESITY
These are measured using weight and height and interpreted as presented below. BMI is calculated the same way for both adults and children. The calculation is based on the following measurement units, formulae and calculation.

Blood pressure is the amount of blood the heart pumps and the resistance to blood flow in the arteries (\(14\)). It is measured in millimeters of mercury (mm Hg). According to research (\(14\)), a blood pressure reading below 120/80 is considered to be normal. The top number (known as the systolic pressure) is the amount of pressure the heart generates when pumping blood out through the arteries. The bottom number (called the diastolic pressure) is the amount of pressure in the arteries when the heart is at rest between the beats. High blood pressure, HBP, is defined as a systolic pressure of 140 mmHg or higher together with a diastolic pressure of 90 mm Hg or higher (\(14\)). HBP can lead to hypertensive heart disease, stroke and kidney disease. It is sometimes referred to as a silent killer.

PROCEDURES
There are currently three universities in Brunei Darussalam. All of them have both local and international students. For ethical reasons, the nationality, ethnicity, religion and other identifying information of the participant student in the present case study are withheld throughout the article.

Prior to administering the instruments, the researcher verbally explained to the participant the purpose of the study and the ethical conditions or requirements for being involved in the study. This discussion centered on issues of voluntary participation, privacy, anonymity, confidentiality, physical and psychological harm, debriefing, and informed consent. The participant was given ample time to reflect on and withdraw from the study if he felt uncomfortable with the research’s purpose and objectives. The participant voluntarily agreed to participate in the study. In addition, the participant also permitted the researcher to use the obtained data in other psychological investigations such as being included in various case studies. No deception was used or involved in this study. Being highly sensitive private information, all the self-reported data were kept strictly confidential and analyzed anonymously without revealing the names. With regard to English language problems, the meanings of difficult English words, sentences and phrases on the Brief Medication Questionnaire 1, BMQ 1 (\(^7\)) and the Resistance to Treatment Questionnaire, RTQ (\(^2\)) were verbally explained to the participant. Furthermore, students at the participant’s university (including the participant himself) take most courses in English language and have participated in many research studies that required them to complete self-report scales / questionnaires in English. The researcher therefore deemed it not necessary to translate the instruments into Bahasa Melayu (Brunei’s mother and official language). Furthermore, the person in this case study read the manuscript for this article and gave his permission for it to be published in a journal as a way of sharing knowledge to improve human life. Thus the study met the ethical requirements for using human participants in research stipulated by the University of Brunei Darussalam, the Government of Brunei, and the 1995 Helsinki Declaration as revised in 2000.

RESULTS
The results of the study are described below according to the three phases of the treatment: baseline; intervention; and follow-up.

BASELINE PHASE
During the intake interview, AMK scored high on all BMQ 1 questions related to the cholesterol medicine’s side effects (e.g. on items such as “I may get unwanted side effects from this drug”; “I worry about the long-term effects of this drug”; and “This drug causes other concerns or problems”). He showed remarkable resistance to the idea that he should take cholesterol medication to improve his health. In addition, the participant’s total pre-test score on the Resistance to Treatment Questionnaire, RTQ, was 156, a pretty high value. AMK’s baseline measures for weight, cholesterol, HBP, and BMI are shown in Table 4 under the period 7 July 2010 to 1 December 2010. During this 6 months baseline period, AMK tried to reduce weight by controlling overeating but without exercise. He also tried to lower bad cholesterol levels solely by careful diet and without using medication. Both of these strategies were not
very successful. Apart from the HBP measures which though high were on upper end of the normal range, all other indicators (weight, cholesterol and BMI) were all too high and bad.

**INTERVENTION PHASE**

The treatment period lasted for about 12 months from 2 December 2010 to 23 November 2011. During this time, AMK tried hard to reduce weight and cholesterol levels using a combination of therapies (CBT, drug, exercise, and diet) described above. Posttest scores on the Brief Medication Questionnaire 1, BMQ 1 (1) and the Resistance to Treatment Questionnaire, RTQ (2) were now much lower. His RTQ posttest score was 88, indicating a lower resistance to taking medication and an increase to self-efficacy for self-care. The participant now had positive attitudes to taking cholesterol medicine and cooperated in doing all the other recommended therapies. In view of this, there was some improvement though not very substantial (as can be seen and noted from Table 4). All the measures for weight, cholesterol, HBP, and BMI went down. The overall combined intervention had an immediate positive effect.

**FOLLOW-UP PHASE**

This lasted a little over 6 months from 24 November 2011 to 30 May 2012. Evidence from Table 4 suggests that the multifaceted intervention was not only positive but also reasonably stable and long-term. However, the readings taken on 30 May 2012 imply that the participant had a tendency to relapse on some factors that cause increases in weight, bad cholesterol and HBP. The participant was taught some relapse-prevention strategies to address this problem.

![Figure 4](image)

Table 4: Assessment review report (Height = 1.75m)

<table>
<thead>
<tr>
<th>Date</th>
<th>Weight (kg)</th>
<th>Good Cholesterol (mmol/L)</th>
<th>Bad Cholesterol (mmol/L)</th>
<th>Total Cholesterol (mmol/L)</th>
<th>HBP (mm Hg)</th>
<th>BMI</th>
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<tr>
<td>Follow-up</td>
<td>72.40</td>
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<td>3.36</td>
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<tr>
<td>Follow-up</td>
<td>66.90</td>
<td>0.87</td>
<td>1.89</td>
<td>3.12</td>
<td>125/80</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Treatment</td>
<td>85.00</td>
<td>1.04</td>
<td>4.34</td>
<td>5.5</td>
<td>120/80</td>
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<tr>
<td>Treatment</td>
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<td>3.97</td>
<td>5.51</td>
<td>120/80</td>
<td>28.75</td>
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<td>18/05/2012</td>
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<tr>
<td>Baseline</td>
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<td>5.64</td>
<td>120/80</td>
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<tr>
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<td>1.05</td>
<td>4.66</td>
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<td>32.32</td>
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</tbody>
</table>

* = District Clinic (regular medical check-up conducted half yearly) Baseline  
# = National Hospital (medical check-up conducted at regular intervals)  
\* = millimetres per litre of blood (mmol/L)

**DISCUSSION**

**OVERALL GAINS**

Based on the findings described above, the participant in the present study made progress in three important areas, namely: changes in his attitudes to cholesterol medication; reducing of weight; and lowering of bad cholesterol. The results shown in Table 4 indicate that the man has made good adjustments in his lifestyle but not enough. Through an eclectic psychotherapy treatment program that included elements of CBT, REBT, cognitive restructuring, and self-instructional therapies, the man was eventually able to modify his TFBs (thoughts, feelings and beliefs) about taking cholesterol medication from being negative to positive. This important emotional and behavioral change enabled him to accept drug therapy for cholesterol which he had intensely resisted previously. Follow-up evidence in Table 4 suggests that AMK is maintaining his new behavior and he needs to do this for survival. Further, although the participant made reasonable and commendable achievements in lowering excessive weight and bad cholesterol, treatment and follow-up data in Table 4 suggest that he still needs to sacrifice and do more. In terms of WHO (3) interpretations or categories presented above under the section dealing with data analysis, the BMI values in Table 4 indicate that this man has moved only one step from being obese during the baseline phase (BMI range = 30.00 – 39.90) to being overweight during the treatment and follow-up phases (BMI range = 25.00 – 29.90). While this lowers his vulnerability and risk for heart disease and stroke, he needs to do more to move one extra step into the normal, healthy and safer BMI range.
range (18.50 – 24.90). Being overweight places him at risk of increased blood pressure, heart disease, Type 2 diabetes, deteriorating joints, abnormal blood fats, certain cancers, chronic low back pain, gallstones and respiratory problems (14).

RECOMMENDED ACTIONS

Leaving AMK alone after the follow-up period was going to be an act of negligence on the part of the counselor. AMK was therefore given two main options. With the help of health professionals he could either develop a new safe and healthy weight, cholesterol, and HBP management program. Within this new program, he could find one or two exercise activities that he enjoys and do regularly. He could vary the exercise to improve overall fitness and keep the program interesting. Alternatively, AMK could stay with the existing intervention regimen to which he is already accustomed but must be intensified to make it more effective. The present treatment program was quite beneficial to the participant and AMK would do well to stick to it. However, in increasing the intensity of the existing intervention program the participant should be careful to ensure that it is not hectic, strenuous and stressful (to produce good results) as these factors can, in themselves, be barriers to achieving his overall objectives. In short, he should remember that it is not the amount or quantity of things that are done in a program which is important but rather the quality of the program activities. For example, the physical exercise program should preferably be neither light nor hard but somewhere in the middle of the range as long as the schedule is adhered to regularly. In addition, he might need to find an exercise partner or buddy to help him to stick to the program. Evidence from the present study suggests that AMK achieved better results when in the presence of others as observers such as family members. AMK should further cut back on salt, red meat, cheese, milk, and ice cream. Red meat (beef, pork, lamb) and dairy products are high in saturated fat. Instead, he should eat more often realistic amounts of white meat (fish and skinless chicken), unsalted nuts, beans, fruits and raw vegetables. Be careful though with cheeses. Low-fat and reduced-fat cheeses are often not so low in fat and are often higher in sodium than regular cheese. AMK chose to continue with his current intervention program but promised to work more closely with his counselor to ensure the program is much more effective. Data for the continuation phase were not collected as this was beyond the scope and outside the objectives of the present case study.

CONCLUSION

The success of the treatment in the present study might be attributed to three main factors: CBT; involvement of family members; and AMK’s strong personal desire to be healthier. Prior to the intervention and during the baseline phase, AMK could not take the cholesterol medication. During the treatment phase, the eclectic CBT program succeeded in eliminating AMK’s fear of cholesterol medicine side-effects. The presence of his wife and daughter as treatment observers further encouraged him to adhere to the drug and exercise therapies. The combined effects of these two achievements helped AMK to increase his self-efficacy for self-care that enabled him to maintain his gains during the follow-up phase. He is still vulnerable and at risk of developing heart disease, stroke, and other health complications. He can avoid these by intensifying his treatment program.

LIMITATIONS

There are three main limitations associated with the counseling strategies used in the present study. The first problem concerns the very direct and confrontational nature of Ellis’s rational emotive behavior therapy (REBT) that requires challenging the client’s thoughts, feelings and beliefs (TFBs). Critics and skeptics would argue that it is better to use confrontation sparingly as a last resort. For example, an early study (15) argued that creating a supportive therapeutic relationship was a much more humane and better way of facilitating change in clients. Second, REBT assumes that all patients’ thoughts are irrational and illogical. The problem with this stance is that irrational thoughts might actually be very logical to an individual in terms of their life experiences in a given context, culture and time (16). Third, the BMI for athletes might be high due to an individual’s building of massive muscles but this does not mean that they are overweight or obese.

References

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The Role of Cognitive Behavior Therapy in Fighting Non-adherence to Medical Advice Maintained by Fear of Drug Side-effects in a Man with Cholesterol, Obesity and Hypertension Problems

childhood and adolescence.
The Role of Cognitive Behavior Therapy in Fighting Non-adherence to Medical Advice Maintained by Fear of Drug Side-effects in a Man with Cholesterol, Obesity and Hypertension Problems

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