Cognitive models and theories

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Abstract

The cognitive theories and models associated with adherence to medical advice such as the Health Belief Model, Rational Choice Theory, Ley’s Cognitive Theory and Protection Motivation Model are investigated in this extended essay. The factors affecting medical non-adherence are explored through the cognitive approach and the research question of: ‘ to what extent do cognitive models and theories offer an explanation for why people do not adhere to medical advice’ is evaluated and deconstructed. Research from various publications and studies have been used in an attempt to examine the extent that cognitive models and theories can offer an explanation for why people do not adhere to medical advice. The research allowed the conclusion to be made that cognitive models and theories are effective in explaining the cause for non adherence but it would be reductionist to ignore the various other factors that contribute to a patient’s

non-adherence to medical advice such as social factors and biological factors. These other factors are also central to answering why adherence occurs as cognitive factors are connected to both social and biological factors

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Introduction

What is medical adherence? According to the World Health Organisation, the definition of long -term medical adherence is ‘ the extent to which a person’s behaviour – taking medication, following a diet and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider.’[1]Haynes et al. stated that compliance and adherence are interchangeable terms but recently, there has been debate about whether compliance is really the same as adherence.[2]The term compliance implies the passive and obedient nature of a patient whereas adherence takes into account the independence of an individual. Thus, if a patient can take control of their own treatment to improve their health, why does non-adherence occur? In the strictest sense, Taylor (1990) suggested that 93 percent of patients failed to adhere to some form of their treatment.[3]However, Sarafino (1994) used a more lax definition of adherence allowing customisation of treatment and proposed that patients were reasonably adherent with 78 percent adherence in short term treatments.[4]The World Health Organisation claims that in developed countries, there is an average of 50 percent adherence to long-term therapy of chronic diseases[5]such as hypertension and diabetes. Out of all the American patients with hypertension, 85 percent ‘ remain undiagnosed, untreated, or inadequately

treated.’[6]In McKenney’s study, fifty participants were studied and evaluated over five months and the results showed that the patients approximately took only 65 percent of their prescribed hypertensive medication and only 20 percent of the participants had taken as many as 90 percent of their prescribed drugs.[7]

From these statistics, it is clear that the definition of adherence is open to subjective interpretation and levels of adherence may vary according to the definition adopted. Therefore, the various studies discussed in this essay are limited as the interpretation of adherence is very broad thus generalisability and usefulness are negatively affected. So what can be defined as non-adherence? Essentially, forgetting to take a dose, missing a dose deliberately, occasional alleviation of therapy and a complete stop to treatment can all be described as non-adherence. There are many causes that can contribute to lack of adherence but focusing on the cognitive approach might provide a more concise answer to the question: To what extent do cognitive models and theories offer an explanation for why people do not adhere to medical advice.[8]

Health Belief Model

According to Cooper, Love, and Raffoul (1982), intentional non-adherence occurs 73 percent of the time.[9]

Figure 1 Diagram depicting Health Belief Model.

Source: (Hayden, 2009)

Source: Stretcher, V., & Rosenstock I. M. (1997). The Health Belief Model. In Glanz K., Lewis F. M., & Rimer B. K., (Eds.). Health Behavior and Health Education: Theory, Research and Practice. San Francisco: Jossey-Bass.

The Health Belief Model (HBM), proposed by Rosenstock (1974) and later evaluated by Janz and Becker (1984), suggested that the probability of compliance to health advice is related to the patient's perception of how severe the disease is and the degree of susceptibility. The basis of perceived threat of the disease can arrive from prior medical knowledge or the patient's perception of the implications of the disease. The likelihood of preventive action is determined through a series of steps. If the patient recognises the illness as a threat, they will proceed to consider perceived barriers against perceived benefits, followed by a cue to action (any event that leads to altered behaviour).[10]However, as Figure 2 indicates, the HBM incorporates social factors, such as cultural upbringing; and cue to action can be linked to social factors such as media and peer pressure so in relation to the research question, cognitive models can explain adherence to a certain extent, but social factors are present also.

One can consider the Turner et al. (2004) study describing the use of HBM by the Osteoporosis Prevention Programme on female patients to illustrate the HBM. Generally, there was a low level of perceived threat of osteoporosis amongst the women due to the common misconception that osteoporosis occurs in older females. To increase perceived susceptibility, the participants were shown a normal healthy bone of a 75 year old woman against a slide of an osteoporotic bone in a 47 year old woman and also images of a fractured spine, hip and waist. It was also emphasised that osteoporosis often showed

no symptoms and was only realised when a fracture took place. To imbue cues to action, a vast amount of information was made available to participants to raise awareness of the threats of osteoporosis, along with bone mineral density testing and consultation classes for dietary alterations and recommended physical activity. In addition, Turner et al. attempted to reduce common perceived barriers. Convenient programme times, each lasting an hour, were organised to facilitate busy schedules and classes took place in a ‘ centrally located, state-of-the-art community centre.’[11]Moreover, free childcare services were provided at the community centre so that participants would not have to worry about their children and the problem of cost was eliminated by offering the programme for free. Turner et al. concluded that participation in health promotion programmes was increased when perceived threat, susceptibility and benefits were increased and perceived barriers were decreased.[12]

Turner et al.’s study had a relatively large sample with 342 women completing the entire programme so research of such complexity requires a huge amount of time, effort and funding. However, as the focus of the study was on women, there would be difficulty generalising to males but it could be said that more females suffer from osteoporosis so generalisation to males was not the intent.

In relation to the research question, the health belief model supports the influence of cognition but simply considering cognitive factors with disregard of other levels of analysis is reductionist. Many perceived barriers are related to social factors and the Turner et al. study shows that one of the main problems was financial situation, which might be linked to social class.

Another social barrier could be peer pressure. If one of the participants were mocked by colleagues for being a hypochondriac, the perceived barrier would be reinforced and obedience could be influenced negatively by the social group. Moreover, media or family members expressing their worries could provide the cue to action.

Rational Choice theory

Perceived Benefits versus Perceived Costs to Patient

The Rational Choice Theory offers an explanation for non-adherence in which patients feel that there is rationale to alter the recommended treatment due to justifications that are believed to be true by the patient, though may not necessarily be true or helpful to the patient's health. An explanation for this phenomena could be due to negative side effects of treatment that alter the patient's quality of life in such a way that they feel that it would be more reasonable to discontinue treatment. An example of non-adherence due to dissatisfaction associated with the side effects of medication is the Bulpitt (1988) review which aimed to investigate the research on effects and complications of medication for hypertension.[13]Antihypertensive medication is known to be linked to impaired sexual function such as erectile dysfunction and it has been reported that the frequency of erectile failure was 6. 7 percent by the age of 55 and 24 percent by the age of 70 in Kinsey et al.'s work.[14]Bulpitt reported that a study by Curb (1985) found that 8 percent of males taking antihypertensive treatment ended the use of medication due to impotence and ejaculation difficulty that emerged after taking the antihypertensive drugs.[15]Notably, it was found by the Medical Research Council (1981) that 15 percent of patients halted medication due

to other side effects[16]such as headaches or dizziness. Though these studies have attributed undesirable side effects with failed compliance, this was applicable to only a small portion of the sample, thus other factors must be considered to attain a more wholesome idea of adherence and avoid reductionism. In addition, these studies are limited in generalisability to females as the studies only involved males and usefulness is questionable as only hypertensive medication were included. Ethics could also be an issue in these studies because investigation into the participant's erectile problems could be humiliating for the subject and might cause feelings of inadequacy which could be classified as mental harm to the participant.

Financial Barriers

The presence of practical barriers could contribute to a patient's decision to disregard medical advice. Financial obstacles such as low income of patients may result in not being able to afford expensive treatments not paid for by National Health Schemes. Karter et al. (2000) concluded from their study on the relationship between financial barriers and adherence to treatment for diabetes that ' removal of financial barriers by providing more comprehensive coverage for these costs may enhance adherence to recommendations for SMBG [self-monitoring of blood glucose].'[17]The study was cross-sectional which provided a snapshot of the frequency of adherence to SMBG so it was less time consuming than a longitudinal study. A vast amount of data was acquired from 44, 181 participants so the study was highly generalisable to the target population of Northern Californian diabetics, though the ethnocentricity of the study limits generalisation to the rest of the world.

Patient-practitioner Relationship

The patient might also fail to comply because they have reason to doubt the effectiveness of the treatment. A study on arthritis patients by Arluke (1980) suggested that if the conditions of the ailment worsen even though the patient has followed prescribed instruction, adherence will be affected negatively.[18]In addition, the Handbook of Clinical Psychology in Medical Settings states that ‘ the most common reason given for intentional non-adherence was that the patient did not believe that the drug was needed in the dosage prescribed by the physician.’[19]The patient might stop treatment out of curiosity to see whether the illness is still present because the patient may be sceptical about the usefulness of prescribed treatment.[20]This lack of trust in the physician’s advice could arise from doubts on the competency or professionalism of their doctor which can be connected with the patient-practitioner relationship. The trust imparted on the physician is somewhat dependent on how the doctor acts or dresses and a study by McKinstry and Wang (1991) in which patients were shown pictures of male or female doctors dressed in either formal or informal clothing. For example, a picture of a traditionally dressed doctor would depict the doctor wearing a formal white coat whereas an informally dressed doctor would be shown wearing jeans. When asked, the patients rated that they had the most confidence in the doctors that were formally dressed and this preference was particularly prevalent in older patients.[21]Though participants were approached at surgeries, this study was low in ecological validity because patients are not normally shown pictures of doctors and questioned when they attend a surgery. The patient-practitioner relationship can be

dependent on the patient’s perception of the physician, but can also be dependent on the social situation and the social interaction between them and the manner of communication could affect the level of understanding of prescribed treatment. Thus, in relation to the research question, we can already see how not only cognitive factors affect adherence, but social aspects such as the communicative skills and the practitioner’s attire could influence adherence.

Understanding

A lack of understanding of the medication and/or the treatment schedule that is prescribed is also a barrier. This problem will not only lead the patient to possibly perform the treatment incorrectly, but can hinder the patient’s memory of the procedure for their treatment. Hadlow and Pitts (1991) reported that around 33 percent of patients do not have proper understanding of commonly used medical terms[22]and as a result, 40 to 80 percent of advice given by the physician is instantly forgotten.[23]Moreover, in a study by McKinlay (1975) of the understanding of information given to women by health workers in a maternity ward, only 39 percent of women actually understood 13 chosen medical terms. Interestingly, the health workers expected even lower levels of understanding but used technical jargon regardless of this.[24]Only female participants were studied so the gynocentrism limits generalisation and perhaps a less gynocentric sample could be attained in a different ward of the hospital, such as physiotherapy. Medical workers could be utilising technical jargon on patients to avoid being asked questions and to assert a sense of authority. In this case, ethics would be an issue as it is the patient’s right to be fully informed about the

treatment and their condition.[25]It is unethical to send patients away with the possibility that they do not fully understand how to use their medication as it could lead to auspicious consequences and there is a greater probability that the patient will fail to adhere, as is described in Ley's Cognitive Model (1988).[26]

Ley's Cognitive Model (1988)

Ley's Cognitive Model states that understanding and memory of information affect adherence and lead to satisfaction which have a positive effect on adherence (see Figure 1).

Figure 2 Diagram depicting Ley's Cognitive Model (1988)

Source: (Kessels, 2003)Ley et al. (1973) conducted a study on patients with a control group of students and measured their recall of a list of medical statements in a structured or unstructured condition. The patients showed 25 percent more recall in the categorised condition with structured information and students showed 50 percent more recall. These results suggest that providing patients with structured information would increase the levels of adherence as there would be a lower probability of forgetting the medical advice. However, this study could be criticised due to the lack of ecological validity as it is unusual for a patient to attempt to recall a list of seemingly unrelated words when they go to a GP surgery. Also, students are more accustomed to learning and remembering information therefore it is questionable whether using a student control group is ideal and a possibly better group would be a diverse sample of patients instead. Furthermore, it would be reductionist to simply assume that the organised nature of

information was the sole contributor to increased levels of recall as other factors could have affected recall, for example, the emotional state of the patient. A study on patient information recall by Anderson et al. (1979) concluded that anxious patients tended to recall better than those that were relaxed.[27]This conclusion suggests that arousal could aid memory which is possibly due to the patient's worries about their health, thus making an extra effort to recall information given to them.[28]

In a more ecologically valid study on the recall of real consultations (instead of list recall) by Ley (1988), it was found that less than 55 percent of information given by the doctor was recalled.[29]Ley concluded some main trends that occurred:

The primacy effect: Patients tended to recall the first information given to them best.

Structured information was better recalled than when non-categorised.

Prior medical knowledge improved recall of information.

The greater amount of information given, the greater amount forgotten

There was no effect on recall when the doctor repeated instructions.[30]

Ley's study was very useful as once reasons for impaired recall were identified, amendments could be made to the consultation process. A later study showed that doctors that had adopted advice from a booklet based on Ley's findings showed that an average of 70 percent of information was remembered by the patient.[31]However, demand characteristics could be

present as the participants were aware of the need to recall information which could have influenced the patient’s attention to details given to them. Therefore, ecological validity, though higher than the previous study, would still not be very high as the situation is still different to a normal surgery visit in which patients could be considering questions to ask the doctor and therefore not pay as much attention to instructions being given.

Protection Motivation Theory

Figure 3 Diagram depicting Protection Motivation Theory

Source: Norman, P.. B. H.&. S. E. R., 1996. Protection Motivation Theory. In Predicting Health Behaviour. Buckingham: Open University Press. pp. 84.

The Protection Motivation Theory (PMT) proposed by Rogers (1983) indicates that the process of taking action to protect oneself, i. e. to adhere to medical advice, follows a series of cognitive decisions. PMT refers to the intention to adhere to the advice of a health worker and is dependent on adaptive (positive response) and maladaptive response (adapted negative response) that influence the chance of survival.[32]Maladaptive responses are influenced by threat appraisal[33]and can be encouraged by intrinsic and extrinsic rewards. For example, in the case of complicated and time consuming treatments, an intrinsic award that could act against adherence could be to avoid the treatment to decrease stress. An extrinsic reward stemming from this scenario would be that skipping treatment would allow time for participation in social gatherings. When perception of severity and vulnerability are high, maladaptive responses will decrease and likewise, greater levels of fear arousal will elicit increased perceived severity and

vulnerability and therefore the patient will make a judgement that levels of threat are high.

Conversely, an adaptive response can be triggered by coping appraisal which is related to how the patient perceives the ailment can be dealt with. [34]Coping appraisal can be increased with higher response efficacy which is the belief that prescribed medication will have an effect on the illness. Another explanation could be that self-efficacy[35]can increase coping appraisal. Adaptive response is also affected by response costs which are, perceived barriers which can inhibit the emergence of adaptive behaviour of adhering to medical advice.[36]

A study on outpatient rehabilitation adherence by Grindley et al. examines the PMT by using it as a screening tool to measure sports injury rehabilitation adherence. Factors of PMT were incorporated in the study by various means. The generation of threat appraisal was dependent on the patient’s belief that the discomfort or even disability of their condition would persist or exacerbate and the fear arousal originating from pain, diagnosis and disability further increased threat appraisal. Coping appraisal was dependent on the patient’s belief in the effectiveness of their treatment and also their ability to successfully complete treatment, which accounted for response efficacy and self-efficacy. Response costs relevant to the situation took the form of anxiety about the required amount of time for rehabilitation, possible experience of pain and financial implications. The data was gathered using a 7-point Likert scale which assessed aspects of PMT such as perceived severity, vulnerability etc., thus there was reduced researcher bias than self-reports as it eliminates the need for researcher interpretation of participant

reports. Grindley et al. concluded that drop out behaviour from the study was related to the perceived severity, self-efficacy and response barriers and that higher self-efficacy was related to higher treatment efficacy.[37]

The study took into account that the severity of a patient's condition could be a confounding variable so as a control, participants that had been prescribed rehabilitation treatment for 4 to 8 weeks were used so as to eradicate patients with minor injuries or chronic illnesses due to dissimilar rehabilitation requirements. Due to this control, the severity of the condition could not influence results and therefore increased the reliability of results. Another strength is that ethical guidelines were followed and informed consent was acquired, with no physical harm imparted on the participants. A problem with generalisability is the ethnocentric nature of the study as only one rehabilitation facility was used in the sample thus the results might have limited generalisability potential when applied to other areas. However, the large sample of 229 participants consisting of 149 females and 80 males was a strength as the results could be generalised to both genders. Another limitation is that the study measures behaviour inside the clinic during attendance but did not examine the patient's behaviour with home physical therapy which behaviour could be different so there is not a wholesome perspective, thus negatively affecting usefulness. Moreover, extraneous variables that may have occurred could include the fact that patients may not have necessarily understood the treatment or the negative consequences that could result from failure to adhere. In addition, the availability of pain killers means that the perception of pain is less severe thus lowering protection motivation. Emotions and mood of the patient could

have a negative effect on adherence as they are maladaptive responses as DiMatteo et al. concluded from their study on the relationship between depression and noncompliance, depressed patients were 3 times more likely to be non-adherent to medical advice than non-depressed patients.[38]Thus other than cognitive factors, the affective state of a patient can have a significant effect on adherence and might limit the extent to which cognitive models explain adherence.

Conclusion

It is evident from the theories examined that there is not an ultimate reason or level of analysis that can explain non-adherence and a holistic analysis is required for a sensible conclusion. The reasons for non-adherence examined in this essay merely focus on the cognitive perspective toward non-adherence and it would be reductionist to claim that any single factor is the sole reason for non-compliance.[39]Many factors intertwine and the cognitive level of analysis can only explain non-adherence up to a certain extent. Evidently, even within the theories discussed in this essay, the social level of analysis has been surreptitiously present because of the many social relations to the theories. To illustrate this point, one can consider the HBM. It involves cues to action but media campaigns and advice are both social factors that trigger the process. Also, in both the HBM and PMT, a potential response cost could form part of social norms. For example, a diabetic might refrain from taking an injection at a restaurant because it goes against social norms. Another example of a social barrier could be how followers of Jehovah’s Witness faith refuse blood transfusions due to their belief that the Bible forbids the ingestion of blood and thus even in emergencies, they will

not accept blood transfusions.[40]In addition, self-efficacy (which is a feature of PMT) is connected to social factors as Bandura stated that judgements of self-efficacy are based on a number of social constructs such as the individual's own achievements, influence of themselves and society, scrutiny of emotional states and observations of others.[41]

Many other possible cognitive reasons for non-adherence have not been mentioned in this essay such as biological factors. Genetics are an example of how biological factors could influence non-adherence to medical guidance. For instance, if a person has inherited aggressive traits through genes from their parents, the aggression might result in negative compliance as the patient does not respond well to advice. A severe brain injury in the memory centres of the brain would also affect adherence but one would argue that the practitioner will consider this and treat the patient accordingly.

Furthermore, there are many limitations to studies on adherence which leaves the validity of studies questionable. Most studies on medical adherence use self-reporting methods which are very subjective and are open to demand characteristics as well as researcher bias because the participant could attempt to report in such a way to aid or sabotage the research and the researcher may become biased because of their enthusiasm or aims. Additionally, the participant may be influenced by social desirability bias because they would like to report in a way which they perceive is the ' right' way.[42]Moreover, it is difficult to accurately measure adherence, i. e. if a different method of measuring adherence was adopted like counting the number of pills the patient has left in the bottle to see how many pills have been taken, it would still not be accurate as we only know

that a certain number of pills have been taken out but we do not know how many pills have actually been taken by the patient.

In conclusion, although the models and theories of cognition offer some explanation as to why people do not adhere, they cannot provide the ultimate answer. Cognitive theories and models can aid prediction of how well a patient will adhere but people are ultimately unpredictable with many individual differences therefore there are many facets to the occurrence of non-adherence. Share this: Facebook Twitter Reddit LinkedIn WhatsApp