



Adherence to HAART: processes explaining adherence behavior in acceptors and non acceptors.

Sigrid C.J.M. Vervoort, Mieke H.F. Grypdonck, Annelies De Grauwe, Andy I.M. Hoepelman, Jan C.C. Borleffs

► To cite this version:

Sigrid C.J.M. Vervoort, Mieke H.F. Grypdonck, Annelies De Grauwe, Andy I.M. Hoepelman, Jan C.C. Borleffs. Adherence to HAART: processes explaining adherence behavior in acceptors and non acceptors.. AIDS Care, 2009, 21 (04), pp.431-438. 10.1080/09540120802290381 . hal-00513470

HAL Id: hal-00513470

<https://hal.science/hal-00513470>

Submitted on 1 Sep 2010

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



Adherence to HAART: processes explaining adherence behavior in acceptors and non acceptors.

Journal:	<i>AIDS Care - Psychology, Health & Medicine - Vulnerable Children and Youth Studies</i>
Manuscript ID:	AC-2008-03-0088.R1
Journal Selection:	AIDS Care
Keywords:	HIV, medication adherence, antiretroviral therapy , qualitative study



Adherence to HAART: processes explaining adherence behavior in acceptors and non acceptors.

Sigrid C.J.M. Vervoort^a, Mieke H.F. Grypdonck^b, Annelies de Grauwe^c, Andy I.M. Hoepelman^a, Jan C.C. Borleffs^d

For Peer Review Only

Abstract

In order to explore and clarify the underlying processes which lead to (non)-adherence behavior in patients treated with highly active antiretroviral therapy (HAART), a qualitative study was conducted. Thirty-seven in-depth interviews were held with 30 Caucasian HIV-positive patients. Additional data were collected by diaries kept by some participants. The analysis took place in a cyclic process; selection of themes was alternated with input of new material. Adherence to HAART is mainly influenced by the experience of being HIV-positive. Acceptance or non-acceptance of HIV leads to one of two basic stances toward adherence: 'being determined to be adherent' or 'medication is subordinate to other priorities in life'. This stance determines the commitment to therapy and influences how patients cope with adherence. Patients who are determined to be adherent find solutions to adherence problems. Patients who are not determined to be adherent solve problems only if the solution does not compromise important aspects of their lives. Insight is provided into the manner in which prevalent themes; 'start of HAART', 'attitude toward medication', 'HAART in daily life', 'contextual factors', 'health and HAART' and 'being informed', influence adherence behavior. Before starting HAART the focus should be on helping the patient to accept HIV as a part of life. The findings need to be taken into account in adherence-promoting interventions.

Keywords: HIV, antiretroviral therapy, medication adherence, qualitative study

Introduction

In the HAART era, HIV- and AIDS-related mortality has declined tremendously (Mocroft et al., 2003; Pallela et al., 1998). Treatment with antiretroviral therapy has significantly improved life expectancy and has turned HIV into a chronic disease. For success of treatment with HAART, adherence is of the utmost importance. Non-adherence to therapy may lead to medication failure due to incomplete viral suppression and to the development of drug resistance (Hecht et al., 1998; McNabb et al., 2001; Race, Dam, Obry, Paulous & Clavel, 1999). The transmission of resistant viruses makes adherence a public health concern (Boden et al., 1999; Wainberg & Friedland, 1998).

On the basis of earlier studies a level of 95% or more was considered necessary to prevent the development of a resistant virus. More recent studies with other types of medication, suggest that durable viral suppression can be achieved on lower levels of adherence (Bangsberg, Weiser, Guzman & Riley, 2005; Dybul et al., 2001). Other studies suggest that the prevalence of resistance to non-nucleoside reverse transcriptase inhibitors is significantly higher at low levels of adherence than that to protease inhibitors (Bangsberg et al., 2003; Bangsberg et al., 2006).

Even though the regimens for (naïve) patients are easier than in the past and there is a better understanding of the required adherence to prevent resistance, adherence still is the central issue as regards treatment with HAART. To attain the benefits of HAART, there is a strong need for effective adherence interventions. For the development of an intervention tailored to the individual situation, it is necessary to understand the way people manage their daily life when taking HAART and the interaction of this process with adherence (Grypdonck, 1996; Meijel, Gamel, Swieten-Duijfjes & Grypdonck, 2004). Many quantitative and qualitative studies have been conducted to explore factors which influence adherence. Most of these studies however did not uncover underlying processes (Vervoort, Borleffs, Hoepelman & Grypdonck, 2007). Furthermore, little attention has been given to the relationship between the influencing factors related to adherence (Vervoort et al., 2007). The understanding of the complex patterns of medication taking and the dynamics of adherence are still under investigated (Sankar, Golin, Simoni, Luborsky & Pearson, 2006).

This article reports the findings of a qualitative study dealing with adherence to HAART. The study was conducted to gather information from the patient's perspective on adherence to HAART in order to explore the meaning that people give to situations and clarify the underlying processes that are at play in adherence.

Method

A qualitative approach based on 'grounded theory' (Glaser & Strauss, 1967; Wester, 1995) was used in order to generate and explore the patient's perspective on adherence to HAART. Thick data have been gathered allowing investigation of the processes that underlie adherence as well as addressing the diversity present in the population.

Participants

Between January 2003 and January 2006, HIV-infected patients treated with HAART were selected and recruited from three HIV-treatment centers, two in Belgium and one in the Netherlands. Patients were eligible to participate if they were Caucasian, Dutch speaking, at least 18 years of age and (>3 months) HAART experienced. Patients were selected by the researchers to create a diverse sample with regard to duration of treatment with HAART, sex, estimated level of adherence (measurable and un-measurable viral load) and exposure to HIV. Theoretical sampling was used as much as possible.

Selected patients were approached by the physicians or the clinical nurse specialists during hospital visits. If the patient agreed, the researcher telephoned the patient to give further information. If the patient was willing to participate, written information was sent and an appointment made. Informed consent was obtained.

Thirty-two patients were selected for the study. Two patients did not want to participate. Table 1 presents demographic and background characteristics. Of the 30 patients 24 were men and six women. Their ages varied from 27 to 71 years. The patients had been aware of their HIV status for between 1 and

19 years. The duration of treatment varied between 4 months and 12½ years. The medication was representative of HAART at the time of the study.

[table 1]

Data-collection

In-depth interviews were used to elicit the experiences, perceptions and attitudes regarding HAART and adherence. A topic-list (table 2) based on factors known to influence adherence provided direction for the interviews (Vervoort et al., 2007). The interviews had the character of open conversations.

We conducted 37 interviews (one patient three times, five patients two times and the others one time). The Dutch patients were asked to keep a diary for two weeks. Eight patients kept a diary in either audio-taped or written form. They documented events, feelings and thoughts related to adherence.

The first interviews took 45-120 minutes; repeat interviews 15-60 minutes. The repeat interviews were conducted after completion of their diary.

During the data-collection-period memos were made containing reflections about interpretations and methods.

[table 2]

Interviewers

The interviews were conducted by two nurses; a PhD-candidate working as a clinical HIV-nurse specialist (SV) and a student working on a master's degree in health education (AG). The student interviewed from a more naive position and asked more confronting questions based on natural astonishment. The interview-styles were not streamlined because the different approaches elicited different responses. Data from Belgian and Dutch patients were not compared. In the analysis the nature of the interviews was taken into account.

Data analysis

All interviews and the audio-taped diaries were literally transcribed. The analysis took place in a cyclic process wherein established themes were alternately confronted with input of new material. All the texts were read out in full once to acquire an overall picture of the situation and were read again line by line to reveal the details. Text parts were coded and concepts were described (Burnard, 1991; Glaser & Strauss, 1967; Wester, 1995). These concepts were categorized according to their similarities and main themes emerged, which were described and discussed by two researchers (MG&SV). Relations between concepts and between themes were established. Developed categories were compared with the interview texts (Burnard, 1991; Glaser & Strauss, 1967; Morse, Hupcey, Mitcham & Lenz, 1996; Wester, 1995). Brief memos supported the analysis.

For the analysis the software-program WINMAX-PRO (Kuckartz, 1998) was used. A code-tree was developed.

Validity

Validity was enhanced by creating a nonjudgmental atmosphere during the interviews and emphasizing the need to learn from patients. Transcribing the interviews literally diminished chances for bias. The use of researcher triangulation in all the phases of the study enhances the validity of the interpretation.

Ethical considerations

The study was approved by the relevant ethical committees.

Findings

Some patients judge themselves to be adherent, while their reported behavior shows that they actually are not. Patients apparently judge their adherence by their own standards and these may differ considerably from the correct medication regimen. Such constructions of adherence should be distinguished from socially desirable answers. Patients are not/no longer aware of the problem.

Non-adherence takes the form of forgetting, postponing, deliberately skipping a dose, not respecting food requirements or drug holidays.

Actual adherence is the result of two elements: the determination to be adherent and the way patients deal with encountered obstacles. The patient can adopt one of two basic stances: 'Being determined to be adherent' (life requires adequate HAART) or 'medication is subordinate to other priorities in life' (HAART should not take precedence over life).

The basic stance determines the way patients deal with temporary obstacles and other influencing factors and influences the actual level of adherence. Which basic stance is adopted is based on acceptance of being HIV positive. Patients are either 'prepared to acknowledge the influence of HIV on one's life' (hereafter we refer to them as acceptors) or 'not prepared to let HIV influence their life' (hereafter the non-acceptors). Acceptance implies that the patient can face the threat of HIV and can give priority to the exigencies of therapy. Non-acceptance implies that patients cannot face the threat that HIV entails for their life and lifestyle. They want to live their life undisturbed by HIV. Hence, instances in which activities would have to be given up for HAART threaten adherence.

Neither this basic stance nor the reactions to temporary obstacles are static; both can change over time. Several of the processes involved are circular. Moreover, many of the identified underlying processes and factors are interrelated and mutually affected. The results of our analysis are summarized in model 1. We elaborate below on the identified factors and processes, structured according to the two basic stances.

[model 1]

Acceptors

Decision making proces

The patient's perception of the decision making process regarding HAART influences adherence. Acceptors are usually content with this process and the moment of decision. They see taking HAART as their own decision.

Ambivalence towards medication

Acceptors feel motivated to take HAART (adherently). They believe in the power of the medication to keep them alive.

Starting HAART is seen as a way to get control over HIV instead of being at the mercy of HIV. Especially patients who had to wait for the start of treatment (declined CD4+) are motivated by a desire to actively beat HIV.

Their determination does not mean that they are not ambivalent towards HAART. They see HAART both as lifesaving and toxic. However, ambivalence does not lead to non-adherence: acceptors rationally choose to continue medication because they give precedence to the long term effects of taking HAART adherently. Only when side-effects become unbearable will they decide to be non-adherent.

HAART in daily life

Although living a normal life not dominated by HIV is important, adherence will get priority. Because HIV has been given a place in life, taking medication adherently can become a routine. Routine influences adherence positively. Acceptors adjust their lives to the requirements of medication and use reminders to stay on schedule. Routine, however, can also lead to taking treatment almost automatically. Patients may not remember whether they took their medication or not. When this occurs, acceptors will look for ways to prevent lapses.

Acceptors seldom think about HIV when taking HAART. They see themselves as belonging to the many that have to take medication for a chronic disease.

Taste, amount and size of the medication or food requirements can make medication intake more complex, but do not lead to non-adherence. Acceptors find solutions that fit their way of life or adapt their way of life to the requirements of the therapy.

For optimal adherence patients need to think in advance and act pro-actively. This necessitates the capacity to think about HIV and its treatment. Acceptors have this capacity.

During the first period of taking HAART, most acceptors were very strict. Getting used to the medication leads to more flexibility. This flexibility comes from familiarity with what needs to be done. Initial anxiety is replaced by fear; rational decision making takes over.

Contextual factors

Patients who feel the need for social-support to take treatment adherently will disclose their HIV-diagnose to persons from whom they expect support. Support can consist of reminding that a dose needs to be taken or of setting out the medication. Most patients, however, do not need that kind of support; they remember to take their medication by themselves. Being reminded by others, however, confirms that they are doing well.

Health and HAART

Objective signs of the effectivity of HAART (viral load/CD4+) and a better physical condition motivate acceptors to continue to take medication adherently. Most of them follow the effects of medication closely.

When side-effects occur, they choose for the long term (survival/prevent resistance). They seem to have anticipated that side-effects could occur, as a consequence of being on HAART. They continue with HAART, except when they are really ill. In such cases, they will discuss solutions with a healthcare provider. For some acceptors long term side-effects such as lipodystrophy and –atrophy make maintaining adherence more difficult, because of the experience of estrangement from one's body. This

can lead to a long drug holiday; the patient prefers to put off HAART until an HIV-related disease occurs.

Being informed

Sufficient information about HIV and HAART is of the utmost importance for adherence. During out-patient visits having enough time to ask questions is essential. Most acceptors have knowledge of HAART and of the importance of adherence. They know the names of their medication. Some can explain in detail why adherence is important, others can only explain it globally. Only a few did not know why adherence is necessary. Some want to have details in order to manage their own regimen, whereas others will simply comply with what is prescribed. Some acceptors' reports of their behavior seem to reflect misconceptions, leading to deviations from the proper regimen.

Non-acceptors

In those patients who are not prepared to let HIV influence their life, mainly the same factors are at play; however, they have different consequences.

Decision making process

The advice to start HAART seriously threatens the possibility of living a life undisturbed by HIV. Some patients need to push HIV as rapidly as possible to the margin of their existence. In some situations the confrontation with HIV due to HAART leads to psychological problems which influence adherence negatively. The advice to start HAART forces some patients to actively cope with HIV.

Many non-acceptors feel they did not make the decision to start HAART themselves, but started because the doctor told them to do so. This influences their adherence negatively and they use it to explain their non-adherence.

Ambivalence towards medication

When HAART is started without a visible risk (based on CD4+ count without HIV-related symptoms) the motivation to take treatment (adherently) may be low. Some patients only feel motivated to take the medication because they want to stay alive for others; (new) partner, parents or children.

Medication can be seen as HIV being controlling life. The fact that HAART has to be taken adherently puts non-acceptors under pressure. They do not want to be forced to do things. By being non-adherent they show that they are in control.

The names given to the medication clearly express ambivalence (*'rotten pills'*, *'very malicious pills'*, *'bloody stuff'*, *'chemical mess'*, *'damn things'*). Ambivalence towards medication seems to be stronger in the absence of HIV-related symptoms at the start of HAART. Ambivalence can lead to non-adherence or a drug holiday, especially when side-effects occur.

HAART in daily life

The need to live a life undisturbed by HIV makes disruptions due to HIV-status difficult to deal with. Sometimes non-acceptors choose to skip a dose in order to avoid confrontation with HIV.

Living as one desires or giving in to the inspiration of the moment is of utmost importance to some patients. Deviations from usual activities or a different weekend rhythm may lead to conflicts in the choice of a scheme. These conflicts are not easily resolved when a patient does not really want to make necessary changes in activities or lifestyle.

Adherence is facilitated when medication fits into one's lifestyle. Patients with hectic/irregular lifestyle have more difficulty attaining adherence. The use of reminders is seldom accepted. Indeed, patients who need routine most have the most resistance against creating routine or using adherence aids.

For non-acceptors adherence can be influenced by the characteristics of the medication, such as taste, number and size of the pills. Food requirements limit flexibility and thereby influence adherence. Demands of life are (easily) given priority over the demands of treatment.

Pro-active coping to preserve adherence is limited. Non-acceptors do not want to pay extra attention to their medications. They do not want to ponder solutions to the conflicts between their activities and the requirements of HAART.

Although medication may have been taken more or less properly in the beginning, after some time they become more lax and give priority to other activities.

Contextual factors

Most non-acceptors do not disclose their HIV-diagnosis and therefore will not receive social-support in taking treatment adherently. Only some patients who feel the need for practical adherence support will disclose their HIV-diagnosis to persons of whom they expect support. Being reminded by others can also lead to non-adherence. It can be seen as a statement of incompetence. Being reminded is experienced as an unwelcome intrusion.

Health and HAART

Objective signs (viral load/CD4+) of the effectiveness of HAART and a better physical condition motivate patients to continue to take medication (adherently). However, when treatment seems to have good effect in spite of non-adherence, the motivation to be adherent disappears. Patients conclude that because they are apparently an exception, and thus do not need to take HAART according to the rules.

Side-effects of HAART that cause visible signs (e.g. lipodystrophy) of the illness threaten secrecy and disturb normal life. In order to avoid these side-effects, patients become non-adherent. Side-effects interpreted as a sign that the medication is “too much” for the body, leads to non-adherence.

Being informed

Non-acceptors have a more limited knowledge of HAART and adherence. Only some of them can name their medications. Many non-acceptors consider themselves as adherent, but judge their adherence against a personal version of the rules. It seems that they justify their behavior by adjusting their knowledge about adherence to their own behavior.

Discussion

This study makes clear that adherence and non-adherence are complex phenomena influenced by interrelated factors and processes. Some of these are related to the nature of the disease, the mode of transmission and to the specifics of the treatment (strict requirements, disturbing side-effects). The study not only confirmed which influencing factors are at play in adherence (Vervoort et al., 2007), the in-depth analysis also revealed underlying processes of adherence to HAART.

The basic stance with regard to adherence is based on the acceptance of being HIV-positive. This basic stance defines what gets priority, therapy or desired lifestyle, and influences reactions to obstacles to adherence. The reactions are not static and can change over time. Consequences of the choices made provide new input that can affect the basic stance. Many processes that are at play in adherence to HAART are therefore circular.

Other qualitative studies have found the issue of priority of life or treatment conditioned by the acceptance of the disease to be a basic issue in adherence. The basic stance is akin to behavioral intentions as used in social-cognitive models of behavior (Ajzen & Fishbein, 1980; Azjen, 2002; Fishbein, 2000; Hochbaum, 1958; Rosenstock, 1966). However, in our study we have used determination rather than intention. It is, indeed, not so much the consequence of a decision concerning a specific behavior, but an attitude towards one's dealing with the (hardships) caused by the disease.

Because of the number and depth of the interviews we could make use of thick data. However, only those patients could be included who were willing to talk about being HIV-positive. Patients who cannot face the confrontation at all will not participate in qualitative studies.

The sample and thus the findings, however, restricted to Caucasians in countries with a highly accessible HIV/AIDS care.

Implications

Self report of adherence seems unreliable if one asks whether HAART is taken as prescribed. Patients should be asked to describe their exact behavior. Indeed, an individual's interpretation of 'good

adherence' can be based on cognitive dissonance or limited knowledge of what is correct adherence behavior.

The basic stance should be examined before HAART is started. Risk assessment for non-adherence should be taken into account. Support needed and appropriate interventions will differ according to the basic stance and the circumstances in the life of the patient. In acceptors, it is meaningful to start preparing for treatment and adherence early.

For all patients the choice of medication needs to be based on what fits best into their lifestyle. The acceptors need practical advice on how to behave in specific situations when obstacles occur. Both patients and providers should be aware that routine can have both positive and negative effects.

For non-acceptors, if medically possible, the focus should be on helping the patient to accept the place of the disease in life before starting HAART. If this is not possible or if the role of HIV in life remains unaccepted, attention should be focused on minimizing interference and increasing skills to minimize conflicts. Patients should be prepared to deal with situations that threaten adherence. It can be helpful to anticipate on problematic situations. Pro-active coping (Aspinwall & Taylor, 1997; Thoolen, Ridder, Bensing, Gorter & Rutten, 2007) using 'if then' questions can be helpful (Gollwitzer & Brandstätter, 1997; Gollwitzer, 1999; Gollwitzer, Fujita & Oettingen, 2004; Prestwich, Lawton & Conner, 2003).

The regimen has to be discussed on a regular basis to detect adjustments and information should be repeated.

Attaining acceptance of the role of HIV in one's life is not only important to the quality of a patient's life, but also to the success of treatment. How to change a non-acceptor into an acceptor is an important question which requires further research.

Acknowledgements

Thanks to all the Dutch and Belgian patients who participated in this study.

References

- Ajzen, I. (2002). Residual Effects of Past on Later Behavior: Habituation and Reasoned Action Perspectives. *Personality and Social Psychology Review*, 6(2),107–122.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs NJ: Prentice-Hall.
- Aspinwall, L.G., & Taylor, S.E. (1997). A stitch in time: Self-regulation and proactive coping, *Psychological Bulletin*,121,417–436.
- Bangsberg, D.R., Charlebois, E.D., Grant, R.M., Holodniy, M., Deeks, S.G. & Perry, S., et al. (2003). High levels of adherence do not prevent accumulation of HIV drug resistance mutations. *AIDS*, 17, 1925-1932.
- Bangsberg, D.R., Weiser, S., Guzman, D., & Riley, E. (2005, February) *95% Adherence Is Not Necessary for Viral Suppression to Less than 400 Copies/mL in the Majority of Individuals on NNRTI Regimens*. Paper presented at the 12th Conference on Retroviruses and Opportunistic Infections, Boston.
- Bangsberg, D.R., Acosta, E.P., Gupta, R., Guzman, D., Riley, E.D., Harrigan, P.R., et al. (2006). Adherence-resistance relationships for protease and non-nucleoside reverse transcriptase inhibitors explained by virological fitness. *AIDS*, 20, 223-231.
- Boden, D., Hurley, A., Zhang, L., Cao, Y., Guo, Y., Jones, E., et al. (1999). HIV-1 drug resistance in newly infected individuals. *Jama*, 282, 1135-1141.
- Burnard, P. (1991). A method of analysing interview transcripts in qualitative research. *Nurse Education Today*, 11(6), 461-466.
- Dybul, M., Chun, T.W., Yoder, C., Hidalgo, B., Belson, M., Hertogs, K.,et al. (2001). Short-cycle structured intermittent treatment of chronic HIV infection with highly active antiretroviral therapy: effects on virologic, immunologic, and toxicity parameters. *Proc Natl Acad Sci U S A*, 98, 15161-15166.
- Fishbein, M. (2000). The role of theory in HIV prevention. *AIDS Care*, 12, 273-278.

- Glaser, B.G., & Strauss, A.L. (1967). The discovery of grounded theory, strategies for qualitative research. Chicago: Aldine.
- Gollwitzer, P.M., & Brandstätter, V. (1997). Implementation intentions and effective goal pursuit. *Journal of Personality and Social Psychology*, 73, 186-199.
- Gollwitzer, P.M. (1999). Implementation intentions: strong effects of simple plans. *American Psychologist*, 54, 493-503.
- Gollwitzer, P.M., Fujita, K., & Oettingen, G. (2004). Planning and the implementation of goals. In K.D. Vohs & R. F. Baumeister (Eds.), *Handbook of self-regulation: Research, theory, and application*. New York: Guilford Press.
- Grypdonck, M.H. (1996). *Het leven boven de ziekte uitvullen; de opdracht van de Verpleegkunde en de Verpleegwetenschap voor chronisch zieken* [Raising life above disease: the mission of the nurse and the nursing science towards chronically ill patients]. Inaugurale rede Universiteit Utrecht. 3rd ed. Leiden: Spruyt, Van Mantgen & De Does BV.
- Hecht, F.M., Grant, R.M., Petropoulos, C.J., Dillon, B., Chesney, M.A., Tian, H., et al. (1998). Sexual transmission of an HIV-1 variant resistant to multiple reverse-transcriptase and protease inhibitors. *N Engl J Med*, 339, 307-311.
- Hochbaum, G. (1958). *Public participation in medical screening programs: A sociopsychological study* (PHS publication no. 572). Washington DC: U.S. Government Printing Office.
- Kuckartz, U. (1998). *winMAX Scientific Text Analysis For the Social Sciences*, Berlin: BSS.
- Meijel, B. van, Gamel, C., Swieten-Duijfjes, B. van, & Grypdonck, M.H. (2004). The development of evidence-based nursing interventions: methodological considerations. *J Adv Nurs*, 48, 84-92.
- Mocroft, A., Ledergerber, B., Katlama, C., Kirk, O., Reiss, P., d'Arminio Monforte, A., et al. (2003). Decline in the AIDS and death rates in the EuroSIDA study: an observational study. *Lancet*, 362, 22-29.
- Morse, J.M., Hupcey, J.E., Mitcham, C., & Lenz, E.R. (1996). Concept analysis in nursing research: a critical appraisal. *Sch Inq Nurs Pract*, 10, 253-277.

- McNabb, J., Ross, J.W., Abriola, K., Turley, C., Nightingale, C.H., Nicolau, D.P., et al. (2001). Adherence to highly active antiretroviral therapy predicts virologic outcome at an inner-city human immunodeficiency virus clinic. *Clin Infect Dis*, 33, 700-705.
- Palella, F.J., Jr. Delaney, K.M., Moorman, A.C., Loveless, M.O., Fuhrer, J., Satten, G.A., et al. (1998). Declining morbidity and mortality among patients with advanced human immunodeficiency virus infection. HIV Outpatient Study Investigators. *N Engl J Med*, 338, 853-860.
- Prestwich, A., Lawton, R., & Conner, M. (2003). The use of implementation intentions and the decision balance sheet in promoting exercise behaviour. *Psychol Health*, 18, 707-721.
- Race, E., Dam, E., Obry, V., Paulous, S., & Clavel, F. (1999). Analysis of HIV cross-resistance to protease inhibitors using a rapid single-cycle recombinant virus assay for patients failing on combination therapies. *AIDS*, 13(15), 2061-2068.
- Rosenstock, J.M. (1966). Why people use health services. *Milbank Memorial Fund Quarterly*, 44, 94-124.
- Sankar, A., Golin, C., Simoni, J.M., Luborsky, M., & Pearson, C. (2006). How Qualitative Methods Contribute to Understanding Combination Antiretroviral Therapy Adherence. *J Acquir Immune Defic Syndr*, 43(Suppl. 1), 54-68.
- Thoolen, B., Ridder, D. de, Bensing, J., Gorter, K., & Rutten, G. (2007). Beyond Good Intentions: the development and evaluation of a proactive self-management course for patients recently diagnosed with Type 2 diabetes. *Health Educ Res*, 7. doi:10.1093/her/cyl160
- Vervoort, S.C., Borleffs, J.C., Hoepelman, A.I., & Grypdonck, M.H. (2007). Adherence in antiretroviral therapy: a review of qualitative studies. *AIDS*, 21, 271-281.
- Wainberg, M.A., & Friedland, G. (1998). Public health implications of antiretroviral therapy and HIV drug resistance. *Jama*, 279, 1977-1983.
- Wester, F.P.J. (1995). *Strategieën voor kwalitatief onderzoek* [Strategies for Qualitative Research], 1th ed. Bussum: Coutinho.

Table 1: Demographic and background Characteristics

Characteristic	Mean	Range
Age (years):	46,2	27 – 71
Men (n = 24)	45,4	27 - 59
Women (n = 6)	49,6	37 - 71
HIV positive (years)	8,33	01 - 19
HAART (years)	6,5	0,33 – 12,5
	Men (24)	Women (6)
	n	n
Current living status		
Living alone	14	4
Living together with a partner	10	2
Living with child(ren)		
Yes	4	1
No	20	5
Exposure to HIV		
MSM	20	
heterosexual	2	5
IVDU	1	1
Blood products	1	
Primary income source		
Own job	14	3
Jobless/ unemployed	3	-
Disability	6	2
Retired	1	1
Therapy line		
1st	3	1
2nd ≥	1	-
3rd	20	5

For Peer Review Only

Table 2: Topic list

Social support versus social isolation
Coping versus avoidance behavior
Depression
Distress
Expectations of HAART
Trust and belief
Knowledge HAART and adherence
Self-efficacy
Stigmatization
Disclosure
Complexity of the regimen
Health care system
Communication
Accessibility
Information
Relationship with Health Care
Provider
Patient characteristics
Duration of the HIV infection
Work
Education
Living situation
Which medication is used
Intake requirements
Use of practical aids

Model 1: Basic attitude of adherence and the reaction to influencing factors

