The Patients' Voice:

Analysis of acceptance and general applicability of AAT - programs as take home version.

Maik Kuhlmann

s0159239

University of Twente, Enschede
Faculty of behavioral sciences
Psychology
First supervisor: Dr.Marcel Pieterse
Second supervisor: Dr. Lisette van Gemert-Pijnen
External tutor: Dr. Eni Becker

Abstract

EN

The purpose of this study is to find out more about the possible success and necessary design steps concerning an online version of an already existing Approach-Avoidance Task (AAT). The focus of this current paper is hence on examining users´ attitude towards the existing AAT and their motivation to continue training with this program at home. It is also placed emphasis on discovering details about an adequate and popular design of a feedback system that heightens compliance, gives the possibility to stay in touch with the patients and monitor the after-care process.

NL

Het doel van deze studie is om meer te komen weten over de mogelijke succes en de stappen die nodig zijn met betrekking tot het ontwerp van een online versie van een reeds bestaande aanpak van de Approach Avoidance Task (AAT). De focus van deze studie is daarom gericht op de houding van de gebruikers ten opzichte van de bestaande AAT en hun motivatie om deze training thuis met deze programma voort te zetten. Het is ook het doel van deze studie om meer te komen weten over details in de opbouw van een goede feedback-systeem dat de naleving verhoogd en de mogelijkheid geeft om in contact te blijven met de patiënten. Ook is het daardoor mogelijk om de nazorg process steunend te begleiden.

The patients voice:

Analysis of acceptance and general applicability of AAT - programs as take home version.

This paper is concerned with the aftermath of the introduction of computer based alcohol-addiction therapy programs using the AAT (Approach-Avoidance Task) . Do patients wish to continue an AAT treatment at home after they accomplished their clinic abidance? And under which external preconditions would they comply? Assuming patients like to participate, what is the advisable and appreciated communication medium? AATs are computer-based programs that promise implicit access to attitudes and associations of the subject being examined. This is attained by offering seemingly unrelated pictures to the participant and measuring the related reaction time (RT). Pictures with a negative or unpleasant connotation are processed explicitly different than positive or pleasant stimuli thereby generating an index of related attitudes and associations. The idea of this basic human mechanism has a remarkable history going back to Greek philosophers like Plato (428–427 B.C.) and Democritus (460-370 B.C). They belong to the founders of the school of hedonism, an ethical model, which states that the pursuit of pleasure and the avoidance of pain is the primary guide of human behavior (2004 Stanford Encyclopedia of Philosophy). Jeremy Bentham (1748- 1832) was the first who not only saw an ethical construct in this philosophy but also saw it as psychological hedonism: a way to describe

how people actually behave (For more details on this matter see Elliot, 1999). Finally the development of dual process theories and a deeper understanding of the goal pursuit concept (P.M. Gollwitzer, 2004) threw a new light into the infamous black-box of the human mind by dividing cognitive processes into reflective (conscious) and impulsive (non-conscious) processes (Reber, 1993, p.219; Hofmann et al., 2007, p. 55). Various research is done that describes the impact of implicit cognition on health behavior explicitly on drinking habits and their genesis (e.g.: Houben et al. 2010; Wiers et al. 2011, p. 490).

Though knowing that a particular behavior is potentially harmful to ones health it is often nevertheless executed. The reason for such self destructive actions is partly explained by the fact that health related behaviors are partially guided by automatic and implicit processes which are not always under conscious control. When this phenomenon is causing harmful addictive behavior an imbalance occurred between relatively strong automatic and relatively weak controlled processes. The strong automatic processes or habits then cause a hyperesthesia for addiction related cues leading to action tendencies which result in addictive behavior. Wiers et al. (2011) designated three major cognitive biases related to alcohol-addiction: (1) An attentional bias for alcohol-related stimuli, (2) a memory bias for the automatic activation of alcohol-related associations and (3) a bias toward automatically activated action tendencies to approach alcohol. By exploiting this principle of operation of the human mind, the AAT can also be used to manipulate peoples behavior by changing or overwriting existing implicit action-tendencies into more accepted and designated terms (Wiers et al. 2011, p. 495). AATs for alcohol addiction therapy focuses on approach-avoidance tendencies towards alcoholic beverages and thereby

helps the patients to recover. According to this concept a computer-based AAT program was introduced in the therapy schedule of the Salus Clinic Lindow, Germany. In the NKT (Neuropsychologisches Kontrolltraining) version of the AAT program the patients were instructed to push away alcohol related pictures, thereby generating an avoidance tendency and to pull neutral stimuli like soft drink pictures to generate an approach tendency. This procedure is known as an CBM (cognitive-bias modification). The tendencies are caused by the "zooming effect". This effect contains that the pictures that are pushed away and pulled respectively shrink and grow, thereby causing a body reference interpretation (Rink & Becker, 2006). This means that if the pictures are pushed they seem to quickly disappear in the distance and therefore are avoided. Results (N=224) demonstrated that "... a brief CBM intervention aimed at modifying automatically activated action tendencies in alcoholic patients changed their approach bias for alcohol to an avoidance bias, with generalized effects across stimuli and measures."(Wiers et al. in press, p.495). Within four AAT training sessions each taking 15 minutes of time alcohol related automatic approach associations could be decreased significantly. This was measured by analyzing the changed reaction times of the patients at the beginning of session one and after the completion of session four. Additionally this effect showed to be resistant over time for at least one year. These results concerning long-term effectiveness could be replicated in a second study (N=447) by Lindenmeyer et al. (2010). A low NNT (number need to treat) of 7 was observed (Rinck & Becker, 2007) making this program a very economical one. This means that compared with other trainings the program can be run at low costs and that not much expenditure of human labor is needed. The optimal duration and frequency was determined (N=111) as six AAT

sessions each with 15 minutes of training. During this practice 1200 pictures (push away 600 alcohol-related pictures and pull 600 neutral pictures) were either pushed or pulled. Accessory training did not show a significant effect (Lindenmeyer et al., 2010). Especially patients with less cognitive control can benefit from the treatment in particular (Eberl et al., 2010) It is possible that this effect occurs because of the resulting strong impact on automatic, implicit processes. About 63% to 70% of the patients who are treated stationary at the clinic are able to pursue their job for at least another two years but about half of the them suffer fall backs (Missel et al., 2010). It is seen as decisive that after a clinical stay there are monitoring possibilities to deal with immediate stress situations and daily life problems. This ascertains interaction possibilities if a critical incident triggers old habits and therefore relapses (McLellan et al., 2005). Due to these findings an internet version (take home version) of the NKT – AAT is scheduled in the commission of the Salus Klinik Lindow. It is planned that this becomes a prominent part of the follow-up care after the on-the-spot support at the clinic is completed. Patients get access to their own virtual training environment by logging in with their own user-name and password. This guarantees that training sessions can be conducted at an individual pace and simplifies training success feedback (changed reaction times). Personal information about their actual situation concerning possible alcohol intake, their engagement in support groups and private follow-up care can be collected by the personnel of the clinic. It is expected that with this project an economical after-care platform can be established that helps to prevent relapses and gives the possibility of immediate support in case of recurrence. This opens a personnel inexpensive possibility for the patients to stay in contact with the clinic and makes it possible to effectively

monitor the success of the after-treatment. Because of this close contact the clinic knows about the patients´ condition and it is possible to promptly deal with relapses in the everyday life. Additionally it is possible to get an insight into information processing of the patients just after a recurrence by comparing reaction times before and after the event. This helps developing new intervention programs like a counseling interview in case of relapse and gives interesting data that can be used to also design interventions for patients with other afflictions e.g. nicotine addiction and depression.

The present study analyzes three major topics. The attitude that patients have pertaining to the NKT – AAT training at the clinic and the associated interest in a take home version of the program (1). Information about mobile popularity, email popularity and favored amount of feedback are collected to help establishing an adequate reminder-system (2). It is also investigated if patients with other trainings that are also based on an AAT show interest in an internet based after-care program (3). These information help to adjust the take home version of the AAT to the needs of the patients and thereby enhance the probability of training compliance. Additionally the willingness of other patients with other trainings (Obesity - AAT and Positivity – AAT) is recorded to give an evaluation of the feasibility for additional online training platforms in the future that also offer the same ecological and communicative possibilities that the online NKT – AAT version provides.

In the following this paper will first be concerned with the used methodical foundations of the study. Afterwards an overview of the results is presented which are later discussed in the last part of this paper.

Method

Participants

The survey was completed by 81 Caucasian participants unequally distributed over three conditions. Data was collected in June and Julie 2012 from patients that had a minimum of six training sessions with the corresponding AAT training. For this study only patients were involved who were guests at the Salus Clinic Lindow, Germany in the time frame from March until Julie 2012. To take part in the survey some restrictions of access were aligned. In the main group only patients who had NKT - AAT practices and whose main diagnose was alcohol addiction without any other drug addiction beside nicotine dependence could participate. This was examined at arrival at the clinic with a Composite International Diagnostic Interview (CIDI) which consists of a circa three hour lasting standardized interview (Robins et al., 1988). These restrictions were necessary to get an unadulterated picture of the main focus group. To get feedback from other application areas of the AAT, also patients who had experience with the Obesity - AAT and with the Positivity – AAT were given the opportunity to participate. These patients had to be diagnosed with either Obesity or as suffering from depressions. All patients were told that neither participation nor refusal had impact on their therapy progress. No direct rewards were offered but the patients were told that their participation would help to improve after-care conditions for both themselves and future patients of the Salus Clinic. All patient names were anonymised and data attribution was managed by using their patient number.

Procedure

Due to insufficient equipment and no internet access in the clinic the data for this study was collected from pen and paper surveys whose content later was digitized for calculation purposes. After the construction of a concept version it was necessary to adapt it to the clinic´s agenda concerning polls. This was done by two therapists and the director of the clinic. In this process several items of the early version of the survey were deleted to make it shorter and less stressful for the patients. After the approval of the survey it was printed and handed out to the patients during a therapeutic meeting. The completion of the survey took only 10 – 15 minutes to heighten the number of participants. About four patients filled in their survey at a time accompanied by one therapist to heighten the return of the filled in papers. Data was transcribed into an excel format and then copied and transposed to Spss to meet the programs requirements. The data of two surveys was later disregarded in data analysis because several questions were not properly answered.

Apparatus

For the development of the survey basically two models that try to explain and to forecast behavior were used to design the content, composition and combination of the items. The Protection Motivation Theory (PMT) (Rogers, 1983) is used to determine the likelihood that the patients in general to accept follow up care. Additionally the second version of the technology acceptance model (TAM2) is used to explore attitudes towards a take-home version of the ATT

program. At the end of the survey several questions concerning the access to telephone, internet, email and PC were asked. This makes it possible to estimate the benefit of each possible way to deliver feedback what finally heightens potential participation rate and reachability of the users for feedback and support issues.

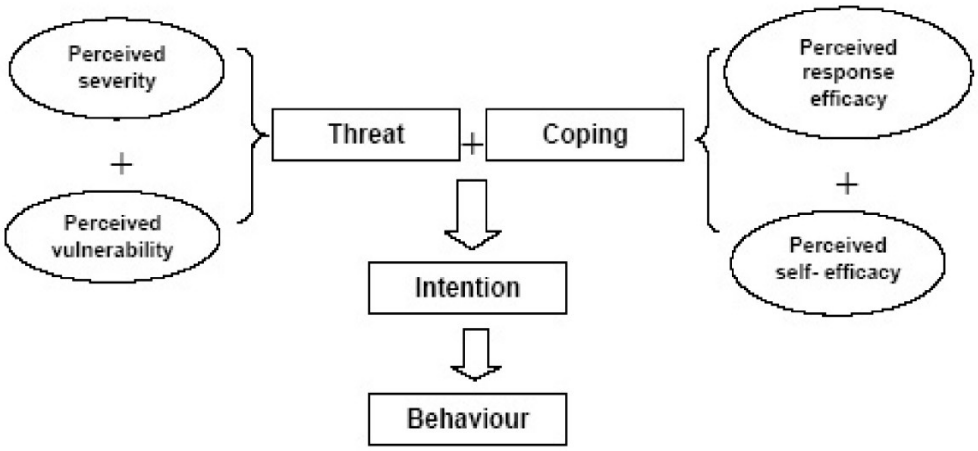
Protection Motivation Theory

The Protection Motivation Theory was originally thought of as a way to explain the genesis of anxiety states (Rogers, 1975). Later versions expanded the theory to other health related areas and mainly focused on the cognitive background processes which mediate behavioral changes. According to these reworked versions of the theory threatening health related events trigger possible coping reactions that reduce or abort the risks (Boer & Seydel, 1996). In this study PMT is used to determine the likelihood of accepting follow up care. This involves measurement of the perceived severity of a threatened event, which in this study is operationalized as relapse (a). The perceived probability of the occurrence, or vulnerability which in this context depicts the chance of a relapse (b). The perceived efficacy of the recommended preventive behavior in form of the respective AAT program the patient has experience with(c). And the perceived self-efficacy i.e. the level of confidence in one's ability to undertake and continue the recommended preventive behavior in form of an approach avoidance training (d).

This is a necessary step towards figuring out the expected interest in this sort of after-care. Only if the normal training procedure and the AAT design itself is considered beneficial

patients can me motivated to engage in an online follow-up care program. A helpful addition to analyze the perceived efficacy of the device are the questions concerning equipment status and experience at the end of the list which help finding the right medium to deliver support and monitoring features of training progress.

Figure 1. (Lee et al. 2007)



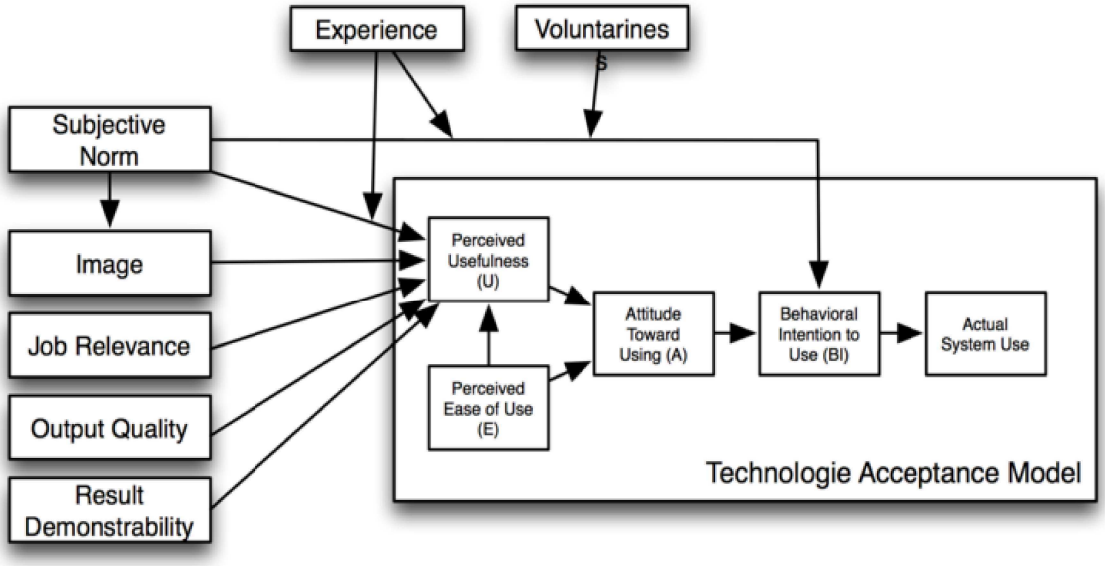
Technology Acceptance Model II

From a historical perspective Fishbein & Ajzen (1975, 1980) laid the foundation for the TAM when they introduced their Theory of Reasoned Action (TRA). The Technology Acceptance Model (Davis, 1989) and the Technology Acceptance Model 2 (Venkatesh & Davis, 2000) try to explain a behaviour, in this case, the patients´ intention to use a medium or not.

Similar to the TAM the TAM 2 states that the intention to use a particular technology depends on the users attitude towards it. The attitude towards the program again is influenced by the perceived ease of use (E) and the perceived usefulness (U). In contrast to its predecessor the TAM 2 operationalises the external stimuli that can explain the formation of these constructs. In particular the influence of social process variables and cognitive-instrumental variables are introduced in this extension of the basic model. Following Venkatesh & Davis (2000) social process variables are the voluntariness of use and the image of the technology. In this study these concepts are approached by determining the general attitude and feeling the patients have towards a fictional take home version of the known AAT program. Cognitive instrumental process variables are output quality, job relevance and result demonstrability. This is accessed by asking the patients if they believe that an online version will have beneficial influence on their therapy after leaving the clinic. In dependence on the work from Ajzen and Madden (1986) the subjective norm is also identified as key predictor for the perceived usefulness. Subjective norm has according to Ajzen and Madden (1986) a direct influence on the intention to perform an action. This means that the Intention to perform an action, and thus the execution of the action itself depends on whether significant others consider it as important or not. This is accessed by asking how competent patients think their therapists are and how good their therapy is conceptualized. If they trust in the competence of the staff and the program, chances are good that subjective norms have a beneficial influence on the intention to make use of a take home version of the AAT program. The image variable is defined by Moore and Benabast (1991; p. 195) as “the degree to which use of an innovation is perceived to enhance one´s status in one´s

social system". This too is accessed by asking the patients if they think an online version of the task could help them in their process of recovery. Output quality and result demonstrability both have decisive influence on perceived usefulness. By asking the participants what they expect about the quality of the training program this construct is stabilized.

Figure 2. (Venkatesh & Davis 2000)



Design

All calculations were executed using IBM SPSS (version 20). Dependent variables are item combinations (constructs) describing (a) the patient´s motivation to continue using the AAT program involving their self efficacy and attitude towards the program, (b) PC- skills, (c) the perceived ease of use, (d) the preferred frequency of feedback, (e) the amount of feedback and the kind of preferred medium to stay in touch with the clinic. It can be chosen between a notification system primarily focusing on (f) mobile based support and (g) an email support system. Additionally a direct measure variable concerning satisfaction with the AAT in general was taken. Independent variables are the demographic information, the patients anamnesis and AAT group membership. Inter-item reliability is assessed via a reliability analysis using cronbach´s alpha or lambda. To test if the population is normally distributed a test of normality is used taking the Kolmogorov-Smirnov test as basis. Correlational analysis between the NKT AAT group and other AAT groups was executed by using T-tests for independent samples. For populations that are not normally distributed significant differences were calculated using the Kruskall-Wallis test. Missing variables are not taken into the calculations. This is the reason for deviating N-numbers in some computations.

Results

Constructs

In this chapter the findings of this empirical study are presented. The quantitative data were collected from the survey and the general CIDI of the Salus Clinic Lindow, Germany. Constructs were build upon item-clusters referring to (a) attitude towards the AAT (N= 9, Cronbachs α = .854) including patients self efficacy (N= 3, Cronbachs α = .762), (b) PcSkills (N=2, Lambda λ sig. α= .008) and (c) the perceived usefulness of the AAT (N= 6, α = .840) are examined in combination with the independent variables. This gives the background to give an answer to research question one "What attitude do the patients have pertaining to the NKT-AAT training at the clinic and the associated interest in a take home version of the program?". The data also delivered information about research question two "How should an adequate user centered reminder-system be designed?" by examining the favored (d) frequency (N= 5, α = .924) , (e) amount (N= 4, α = .930) and favored information medium (f) Mobile phone (N= 4, α = .796) or (g) Email (N= 3, α = .932) in combination with the independent variables. Finally in the last part research question is answered "Do patients that worked with an other AAT program show interest in an internet based after-care program?" This is done by comparing both groups on the base of all construct variables. Independent Variables used were: Age, Level of education, Total time addicted, Number of support groups, Prognosis, Dehabituations, Sex and the training condition. General percentages were calculated to determine the quantity of equipment, available to the patients at home. About 61.7 % of the respondents had access to a working PC with an

active internet connection. 70.4 % possessed a telephone connection and an overwhelming majority of 92.6 % own a mobile phone.

General outcomes

Perceived Self Efficacy had a very low mean value ($\bar{x}$= 1.7, s= .6465) which implies that these patients in general feel confident to continue after care programs. Attitude towards the AAT was restrained when averaged over all cases ($\bar{x}$ = 2.576, s= .7). The user experience concerning their computer skill were average ($\bar{x}$ = 2.4383, s= 1.0). The usefulness of the AAT program was considered as quite low considering that a likert scale format from 1 (best) to 5 (worst) was used ($\bar{x}$ = 3.33, s= .796). Frequency of feedback ($\bar{x}$ = 2.9086, s= 1.195) was not wished as much overall as a higher amount of feedback ($\bar{x}$ = 2.676 s= 1.242). Mobiles ($\bar{x}$ =2.78, s= .92) are more popular than emails ($\bar{x}$ = 3.25, s= 1.21).

Table8: Means and std. Deviations of the main Variables

Variable	Mean	Std. Deviation
Self Efficacy towards follow up	1,7202	0,64648
Attitude AAT	2,5765	0,69969
PC skill	2,4383	1,0012
Usefulness AAT	3,3292	0,79625
Frequency Feedback	2,9086	1,19501
Amount Feedback	2,6759	1,24213
Popularity Mobile	2,7802	0,92065
Popularity Email	3,25	1,20934

Age

Mean age was 47.69 years, s= 8,585. A correlation using Spearmans rho (ρ) was executed. PC skill (r =,255 ; p < .022) and the popularity of mobiles (r = .372; p < .001) differed significantly when tested in correlation with age (alpha <0.05). A Kolmogorov-Smirnov test indicated that the data was not normally distributed (df= 10, p= .006) with a kurtosis of ,222 of and a skewness of -,651 concerning age differences. Therefore a nonparametric Kruskall – Wallis test was conducted relating the patients age to the data. Differences were found for PC skill (χ^2 = 11.496, df= 2, p= .003), perceived usefulness (χ^2 = 6,599, df= 2, p=.037) and the popularity of mobiles (χ^2 = 14,632, df= 2, p=.001). A pairwise comparison using a Mann-Whitney test was conducted to examine the direction of distribution. All comparisons showed that younger patients had better PC skills (Z= -2,927, p= .003), perceived the AAT as more useful (Z= -2,387, p= .016), and mobiles were more popular in this group (Z= -3,448, p= .0001).

Level of education

A correlation using Spearmans rho (ρ) was executed. PC skill (r = -,250; p < -0.025), and the popularity of mobiles (r =,255; p < 0.021) differed significantly when tested in correlation with Level of education (alpha <0.05). A Kolmogorov-Smirnov test indicated that the data for PC skill (df= 15, p= .0001) and perceived usefulness of the AAT (df= 18, p= .027) was not normally distributed . A Kruskall – Wallis test found significant differences for skill (χ^2 = 6,111, df= 2, p=.047) and usefulness (χ^2 = 6,483, df= 2, p=.039). Tests with a M-W indicated that higher educated patients had better PC skills (Z= -1,93, p= .03) and found the AAT more useful

(Z= -2,374, p= .018). The popularity of mobiles was normally distributed and therefore tested with a t-test after adding up the two lower education levels that had no significance to each other in a prior tested anova. This test showed (t= -2,059, df= 79, p= .0427) that more educated patients significantly dislike mobiles more than lower educated patients.

Total time addicted

A correlation using Spearmans rho (ρ) was executed. PC skill (r =,255 ; p < .028) and the popularity of mobiles (r = ,360; p < .0001) differed significantly when tested in correlation with the total time addicted (alpha <0.05). PC skill was not normally distributed (df= 36, p= .006) and there were no significant differences (χ^2 = 5,662, df= 2, p= .059). The popularity of mobile showed to be normal distributed (df= 36, p= ,200). Because in an anova calculation with bonfferoni distances the two highest categories were not significant to each other they were added up and tested against the lowest category with a t-test. It was statistically significant (t= -2,80 p= .006) that patients who were addicted for less than ten years liked and used the mobile more than patients that were addicted for a longer time.

Number of support groups

A correlation using Spearmans rho (ρ) did not deliver any viable significant differences. A Kolmogorov-Smirnov test indicated that the data was not normal distributed (df= 48, p= .002) with a kurtosis of -1,233 of and a skewness of -.110. In a Kruskall – Wallis test Feedback via Mobile (χ^2= 4,89, df= 2, p= 0,03) and via Email (χ^2= 3,839, df= 2, p= 0,048) were both

significant. It was then tested for significant differences in the group by testing no prior therapy vs. at least one prior therapy with a t – test. There was significant statistical evidence that people who at least visited one support group prior to the AAT training liked more than the others to be informed via mobile (t= 2,10 p= .0011) and and via email (t= 2,50, p= .009).

Prognosis

Prognosis showed not to cause any viable significant differences behalf a borderline significant result concerning mobile popularity (χ^2 = 3,854, p= .049).

Dehabituation

A correlation using Spearmans rho (ρ) was executed. Attitude towards the AAT (r =,255 ; p < .014), The desired frequency of feedback (r =,223; p < .045) and the desired amount of feedback (r =,038 ; p < .038) differed significantly when tested in correlation with age (alpha <0.05). The distribution achieves normality and therefore a t test is executed after summing up the groups that did not achieve significance. Now more than two dehabituation vs no dehabituation is tested. Results show that patients who had made experience with at least two dehabituations had a significant better attitude towards the AAT (t= -2,7928, p= .007) and wanted more (t = -3,007, p= .004) and more frequent feedback (t= -3,135, p= .002).

Sex

62 % of the patients were men. The data of the sex variable were not normally distributed. A Mann-Whitney test was used to find significant differences. Only significant result was that women have a lower attitude towards the AAT (t= -2,599, p= 0,009)

Training

The data of the training variable were not normally distributed. Using a Mann-Whitney test the desired amount of feedback (Z= -2.30, p= .021) and the popularity of emails (Z= -2,144, p= .032) became significant, indicating that the patients that have experience with the NKT version of the test want to get more feedback via mail.

Discussion

This last chapter starts with concluding the findings and results this study produced. Hereafter these finding are discussed and possible implications are evaluated. The selection of the highlighted findings in this section underlies subjective preference and not all statistically significant differences are discussed in detail. These findings too don’t implicate to prove facts but are based on probability. In the last part of this chapter possible shortcomings and limitations of this paper are analyzed.

Findings and results

Main aspect of this study was to examine the possibility and the expected acceptance of an online version of the computer based NKT- AAT program which currently is used in the Salus Klinik Lindow, Germany. By combining the Protection Motivation Theory (PMT) and the Technology Acceptance Model 2 (TAM2) three core aspects that mediate the usage of such a technology were developed. User attitude towards the program, the users self efficacy, their experience with the system and the ease of use it implies were analyzed. It was found that the patients in general had very high self efficacy but the attitude towards the AAT program and its perceived ease of use were only moderate. Overall patients preferred a massed-together feedback system instead of a high frequency feedback system. In general mobiles were more popular than emails as communication devices. The age of the patients showed to be a great discrimination factor. Younger patients had better PC skills perceived the AAT as more useful and mobiles were more popular in this group than within the group of the older patients. An interesting factor was that a higher level of education negatively influenced the popularity rating of mobile phones. It also showed to be important for this rating how long patients were already addicted implicating higher popularity for mobiles within the group of people who´s addiction did just arise. A possible reason for these findings can be that people who suffer for a long time from addictive behavior are older than people who just began. Therefore it is probable that there exists a close link to the people´s age which mediates the popularity of mobiles. People who at least visited one support group prior to the visit at the clinic were more willing to accept feedback via

mobile and email support. Patients that already did have experience with withdrawal showed to have a higher attitude towards the program, perceived it as more useful than the others and were more likely to accept feedback. Data suggested that females very much disliked the AAT when related to the male patients. People that did the NKT program designed for alcohol-addicted patients generally wanted more feedback in comparison with patients in the other training conditions.

Interpretation

The relative low percentage of patients that own a PC with an internet connection makes it a challenge to find enough participants who at least fulfill basic requirements. In this respect it is good news that acceptance and equipment requirements are largely met by younger patients that most likely grew up with these devices an therefore have an easier access to this “new” technology. This assumption makes it plausible that the common acceptance of an online version of the AAT will rise in the future. On the background of these findings it is notable that an online version is best suited for young patients that already had a therapy. In general they have higher technical skills and a greater computer and mobile affinity. The reason for this may be that they are disappointed with the therapies they made in the past and like the new technical style of this computer based program. The overwhelming percentage of people who possess a mobile phone and the better rating concerning popularity in general makes this way of communication with the patients an obvious choice. If technical issues are not a barrier a SMS based reminder-system could effectively reach patients after their stay at the clinic. It might be worth a thought to

develop an app of the AAT program with which training is possible everywhere. Future research could prove effectiveness of this "AAT to go" considering that a mobile frame is much smaller and only a basic keyboard is featured. Also technical advancement of mobile hard drive capacity, computation power and graphic improvements make it likely that these devices can adopt the functionality of PC programs. Feedback will more likely be appreciated if its offered infrequently but comprehensive. It is probable that patients don't want to have another close time schedule that continually produces messages and therefore stress. It became very clear that women in comparison to men very much disliked this form of therapy. Reasons for this could be that they like more communicative forms of therapy and don't enjoy it as much as men to train on their own. An interesting avenue for future research could involve finding a way to make the program more attractive to women by offering an integrated chat-tool within their personal virtual training area which makes it possible to not only continue training but also to stay in touch with other befriended patients. In the light of the high perceived self efficacy to continue training of the patients, the only average rating of the attractiveness of the AAT program and its perceived ease of use it is advised to conduct additional qualitative user centered research. It should be investigated in how far the design and the perceived functionality of the program itself could be improved. It also is advisable to take a closer look at the other trainings and the possibilities that arise from the introduction of an online version. There were no major differences between the experience of the NKT version and the other versions of the program thus promising the same compliance and benefits for the patients from the other programs. Also designing an online version for these patients would probable have the same ecological

advantages concerning offering and monitoring of the aftercare. AAT programs showed to be effective in the treatment of alcohol addiction. Not much is known yet about the practical benefit of take home versions of the AAT considering that there are no published studies in this field of research. But as illustrated in this paper a modified more popular version of the AAT might be worth a try. It is not advised to generalize the findings of this study to other areas of AAT usage because only alcohol-addicted patients that followed a clinical therapy program participated in the study. Therefore it is expected that people who encounter the AAT program in other settings and in other health conditions will have deviant attitudes towards a take home version and different usage habits concerning mobile, PC and Email communication.

Implications and shortcomings

Due to the reason that a very short questionnaire was expected to not overly stress the patients some constructs show a lack of internal validity. That´s the reason why some constructs originally involved in the survey were not taken into data evaluation and thus discarded. It would be interesting to ask the patients about the perceived severity of a relapse and the perceived probability of such a incident. This would deliver additional data to consolidate the calculated probability of compliance with the online AAT program. Also the low number of respondents who have passed through the other trainings is far from representative. Therefore it just gives a limited insight into the acceptance of a potentially great tool for after-care in these areas.

The TAM 2 which is used in this study is very popular among researchers that want to predict the usage of a technical device. Until today over 700 citations of Davis et al. (1989) exist

which is a very larger number considering it is an article in an applied field (Bagozzi 2007). Szajna (Szajna 1994) found a high predictive validity that the intent to use a device is highly depended on the attitude towards it. The work of Davis et al. was replicated by Adams et al. (Adams 1992) and demonstrated the reliability and validity of the scales used. But there is also the criticism that this model ignores much contextual variables that may moderate the perceived usefulness and ease of use (Bagozzi 2007). It may be beneficial for follow up studies to test the construct of technology acceptance by applying other theories and compare results afterwords with the results from this study.

References

Aarts, H. (2007). Health and goal-directed behavior: The nonconscious regulation and motivation of goals and their pursuit. *Health Psychology Review*. 53- 82

Adams, D. A; Nelson, R. R.; Todd, P. A. (1992), Perceived usefulness, ease of use, and usage of information technology: A replication, *MIS Quarterly* 16: 227–247

Ajzen, I. & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.

Ajzen, I. & Madden, T. J. (1986). Prediction of goal directed behaviour: attitude, intentions and perceived behavioural control. *Journal of Experimental Social Psychology*, 22, 453-474.

Bagozzi, R.P. (2007), "The legacy of the technology acceptance model and a proposal for a paradigm shift.", *Journal of the Association for Information Systems* 8, p. 244–254.

Boer, H., & Seydel, E.R. (1996). Protection motivation theory. In M. Connor and P. Norman (Eds.) *Predicting Health Behavior*. Buckingham: Open University Press.

Bentham, J. (1779/1879). Introductions to the principles of morals and legislation. *Oxford, England: Clarendon.*

Davis, F. D. (1989). Perceived Usefulness, Perceived Ease of Use and User Acceptance of Information Technology, *MIS Quarterly, 13,* 319-339.

Eberl, C., Lindenmeyer J , Becker, E., & Rinck, M. (2010). *Je mehr, desto besser? – Die Vorhersage des Therapieerfolgs durch implizite Messverfahren bei Alkoholpatienten.* Poster auf dem 3. Deutschen Suchtkongress, Tübingen, 22.-25. 09. 2010.

Elliot, A. J. (1999). Approach and avoidance Motivation and Achievement Goals. *Educational Psychologist* 34(3), 169-189

Fishbein, M. & Ajzen, I. (1975). *Belief, Attitude, Intention and Behavior. An Introduction to Theory and Research*.Massachuttes: Addison Wesley

Gollwitzer M. G., Fujita K., Oettingen G. (2004). Planning and the implementation of goals. Handbook of self-regulation: Research, theory, and applications., *New York, NY, US: Guilford Press.* (pp. 211-228)

Houben, K. (2010). Learning to dislike alcohol: conditioning negative implicit attitudes toward alcohol and its effect on drinking behavior. *Psychopharmacology* 79–86

McLellan, A.T., McKay, J.R., Forman, R., Cacciola, J., & Kemp, J. (2005). Reconsidering the evaluation of addiction treatment: From retrospective follow-up to concurrent recovery monitoring. *Addiction, 100,* 447-458.

Moore, C. G. & Benabast, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information Systems Research, 2*, 192-222.

Missel, P. et al. (2010). Effektivität der stationären Suchtrehabilitation – FVS-Katamnese des Entlassjahrgangs 2007 von Fachkliniken für Alkohol- und Medikamentenabhängige. *Sucht aktuell*, 1, 9-20.

Reber, A. S. (1993). Implicit learning and tacit knowledge: An essay on the cognitive unconscious. *New York, NY: Oxford University Press.*

Rinck, M. & Becker, E. S. (2007). Approach and avoidance in fear of spiders. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*, 105-120.

Robins, L.N., Wing, J., Wittchen, H.U., Helzer, J.E., Babor, T.F., Burke, J., et al. (1988). The Composite International Diagnostic Interview: An epidemiologic instrument suitable for use in conjunction with different diagnostic systems and in different cultures. *Archives of General Psychiatry*, *45*, 1069–1077.

Rogers, R. W. (1975). A protection motivation theory of fear appeals and attitude change. *Journal of Psychology,* 91, 93-114.

Rogers, R.W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. Cacioppo & R. Petty (Eds.), *Social Psychophysiology*. New York: Guilford Press.

Stanford Encyclopedia of Philosophy (2004). Retrieved from the Web 7/01/12. http://plato.stanford.edu/entries/hedonism/#2

Strack, F., & Deutsch, R. (2004). Reflective and impulsive determinantsof social behavior. *Personality and Social Psychology Review*, 8, 220–247.

Szajna, B. (1994), "Software evaluation and choice: predictive evaluation of the Technology Acceptance Instrument", *MIS Quarterly* 18, p. 319–324

Venkatesh, V. & Davis, F.D. (2000). A Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. *Management Science, 46*, 186-204.

Wiers R. W., Eberl C., Rinck M.,Becker E. S., Lindenmeyer J. (in press). Retraining Automatic Action Tendencies Changes Alcoholic Patients' Approach Bias for Alcohol and Improves Treatment Outcome. *Psychological Science.*

Figure Captions

Figure 1. Flow chart of Protection Motivation Theory. Lee et al. BMC Cancer 2007

Figure 2. Venkatesh, V., Davis, F.D. A. Theoretical Extension of the Technology Acceptance Model: Four Longitudinal Field Studies. Management Science, 46, 2000, 186-204.

Fragebogen zum Joysticktraining

Willkommen zu unserer Umfrage zum Joysticktraining.

- Das ausfüllen des Fragebogens dauert nur wenige Minuten.
- Bitte versuchen Sie so genau wie möglich ihre Meinung wiederzugeben.
- Pro Frage bitte nur eine Auswahl treffen und Korrekturen bitte deutlich auf dem Fragebogen angeben.

Vielen Dank für ihre Teilnahme.

Frage	Ihre Antwort
01.) Ich könnte mir vorstellen nach dem Klinikaufenthalt eine Selbsthilfegruppe aufzusuchen.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
02.) Ich glaube, dass Psychotherapie der richtige Ansatz ist und zur Verbesserung entschieden beiträgt.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
03.) Der Gedanke an die Zeit nach dem Klinikaufenthalt erfüllt mich mit Sorge.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
04.) Ich habe Erfahrung im Umgang mit Computern.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
05.) Ich nutze den PC regelmäßig für private Zwecke.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
06.) Das Joysticktraining ist übersichtlich aufgebaut.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
07.) Es fiel mir leicht mit dem Joysticktraining zu arbeiten.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
08.) Ich glaube, dass das Joysticktraining einen positiven Effekt auf mich hat	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab

09.) Ich habe eine positive Einstellung zu dem Joysticktraining.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
10.) An meinen Reaktionszeiten konnte ich sehen, dass ich Fortschritte gemacht habe.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
11.) Das Joysticktraining hilft mir einen Rückfall zu vermeiden.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
12.) Ich merke, dass das Joysticktraining Auswirkungen auf meinen Umgang mit alltäglichen Situationen hat.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
13.) Es fällt mir leichter mit dem Joysticktraining zu arbeiten als mit anderen Therapieangeboten.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
14.) Ich finde, dass das Joysticktraining ein guter Ersatz für aufwendigere Therapiemaßnahmen ist.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
15.) Das Joysticktraining ist eine gute Möglichkeit , um “spielend” meine Ziele zu erreichen.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab

16.) Haben Sie zu Hause Zugang zu einem eigenen funktionierenden PC?	○ Ja ○ Nein
17.) Verfügen Sie zu Hause über einen Internetanschluss?	○ Ja ○ Nein
18.) Haben Sie eine eigene E- Mail-Adresse?	○ Ja ○ Nein
19.) Verfügen Sie zu Hause über einen Telefonanschluss?	○ Ja ○ Nein

20.) Besitzen sie ein Mobiltelefon?	○ Ja ○ Nein

*Stellen Sie sich vor, Sie würden eine Version des Joysticktrainings mit nach Hause nehmen. Welche Unterstützung durch die Klinik würden Sie sich bei der Anwendung zu Hause wünschen?

21.) Ich würde gerne regelmäßig an die Anwendung des Joysticktrainings erinnert werden.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
22.) Ich möchte gerne vor jeder Trainingseinheit eine Erinnerungs- E-Mail oder SMS erhalten.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
23.) Häufige Erinnerungen an das Training würden mir dabei helfen das Joysticktraining beizubehalten.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
24.) Ich glaube, dass es mir leicht fiele, mich an die entsprechenden Termine zu erinnern.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
25.) Ich möchte gerne häufig über meine Fortschritte (veränderte Reaktionszeiten) informiert werden.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
26.) Ich möchte gerne ausführliche Informationen über meine Fortschritte (veränderte Reaktionszeiten) erhalten.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
27.) Ich würde mir wünschen, durch das Training engen Kontakt zur Klinik halten zu können.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
28.) Ich würde es begrüßen, mich mit einem Therapeuten über meinen Fortschritt (veränderte Reaktionszeiten) unterhalten zu können.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab

29.) Ich würde mich freuen, mich telefonisch mit einem Klinikmitarbeiter über mein Training austauschen zu können.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab

Für die Entwicklung künftiger Therapieangebote haben wir abschließend noch folgende Fragen:

30.) Ich benutze mein Mobiltelefon täglich mehrere Male.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
31.) SMS senden und empfangen gehört bei mir zum Alltag.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
32 Im Allgemeinen bin ich über mein Mobiltelefon gut zu erreichen.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
33.) Ich benutze mein Mobiltelefon gerne als Terminplaner.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
34.) Informationen erhalte ich lieber über SMS als über E-Mail.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
35.) Ich überprüfe regelmäßig mein E-Mail Postfach.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
36.) E-Mail senden und empfangen ist für mich eine alltägliche Angelegenheit.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab
37.) Ich lasse mich gerne per E-Mail an Termine erinnern.	1 2 3 4 5 stimme stark zu ○ ○ ○ ○ ○ lehne stark ab