

Blended Face-to-face and Web-based Smoking Cessation Treatment: a description of patients' user experience

Lutz Siemer, Somaya Ben Allouch, Marcel E Pieterse, Marjolein Brusse-Keizer, Robbert Sanderman, Marloes G Postel

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Abstract

Background: Blended treatment – a combination of Web-based and face-to-face (F2F) therapy – is a promising eHealth service, because it is expected that in blended treatment the strengths of one mode of delivery will compensate for the weaknesses of the other.

Objective: The aim of this study is to examine the key elements of the patients' user experience (UX) in a blended smoking cessation treatment (BSCT) in routine care.

Methods: Patients' UX was collected by in-depth interviews (n=10) at an outpatient smoking cessation clinic in the Netherlands. Content analysis of semantic domains was used to analyze the patients' UX. For the description of the UX, Hassenzahl's UX model from a user perspective was applied examining the key elements of UX: (1) standards and expectations, (2) apparent character (pragmatic and hedonic attributes), (3) usage situation, and (4) consequences (appeal, emotions, behavior).

Results: In general, the UX of BSCT was good. Patients had a positive-pragmatic standard and neutral-open expectation towards BSCT, and the pragmatic attributes (usability, utility) of both the Web-sessions and the F2F-sessions were mostly positive. However, for the hedonic attributes (stimulation, identification, evocation), Web-sessions differed from F2F-sessions: patients reported lower stimulation for the Web-sessions ("online won't get through to me"), lower identification ("online is not my style"), and negative evocations (comparing the Web-sessions to e.g. "bookkeeping"). Ultimately, we found three types of combinations of appeal, emotions (e.g. satisfaction) and behavior (adherence; quitting): "positive", "negative", and "mixed".

Conclusions: This study aimed to provide insight in the user experience (UX) of a blended treatment. In the light of this study, the expectation that blended treatment combines "the best of both worlds" because the strength of one mode of delivery can compensate for the weaknesses of the other, can be supported. However, this was mainly found in only one way: F2F-sessions compensated for the weaknesses of Web-sessions. Further work needs to be done to investigate how the integration of F2F- and Web-treatment can be carried out to ultimately increase the effectiveness and efficiency of a blended treatment. This study provides a hint to explore this question by emphasizing the relevance of aspects of hedonism such as e.g. fun, joy or happiness which may be addressed to further improve UX and ultimately treatment effectiveness. Clinical Trial: trialregister.nl NTR5113

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Original paper

Blended Face-to-face and Web-based Smoking Cessation Treatment: a description of patients' user experience

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Abstract

Background

Blended treatment – a combination of web-based and face-to-face (F2F) therapy – is a promising eHealth service, because it is expected that in blended treatment the strengths of one mode of delivery will compensate for the weaknesses of the other.

Objectives

The aim of this study is to explore this expectation by examining the patients' user experience (UX) in a blended smoking cessation treatment (BSCT) in routine care.

Methods

Patients' UX was collected by in-depth interviews (n=10) at an outpatient smoking cessation clinic in the Netherlands. Content analysis of semantic domains was used to analyze the patients' UX. For the description of the UX, Hassenzahl's UX model was applied examining the 4 of the 5 key elements of UX that form the UX from a user perspective: (1) standards and expectations, (2) apparent character (pragmatic and hedonic attributes), (3) usage situation, and (4) consequences (appeal, emotions, behavior).

Results

BSCT in general appeared to be a mostly positively experienced service. Patients had a positive-pragmatic standard and neutral-open expectation towards BSCT in general at treatment start, and the pragmatic attributes of the F2F-session were mostly perceived as positive while the pragmatic attributes of the web-sessions were perceived as both positive and negative. For the hedonic attributes, there seems to be a difference between the F2F-sessions and the web-session. Specifically,

the hedonic attributes of the web-sessions were experienced mostly negative, while in turn the hedonic attributes of the F2F-sessions were mostly positive. For the usage situation, the physical and social context was experienced positively while the task and technical context was experienced negatively. Nevertheless, the consequential appeal of BSCT in general was positive. However, the consequential emotions and behavior varied, ultimately resulting in diverse combinations of consequential appeal, emotions and behavior (positive, negative, and mixed).

Conclusions

This study aimed to provide insight in the user experience (UX) of a blended treatment and supports the expectation that in blended treatment one mode of delivery may compensate for the weaknesses of the other. However, in this certain setting, this is mainly found in only one way: F2F-sessions compensate for the weaknesses of web-sessions. As a practical conclusion, this may mean that the web-sessions, as they are supported by the strength of the F2F-sessions, offer an interesting approach to further improving blended treatment. Our theoretical findings reflect the relevance of aspects of hedonism such as for example fun, joy or happiness in UX, which were not mentioned in relation to the web-sessions and only scarcely in relation to the F2F-sessions. Future research should further investigate the role of hedonistic aspects in blended treatment and if increased enjoyment of blended treatment could increase treatment adherence and ultimately effectiveness.

Trial registration: [trialregister.nl](http://www.trialregister.nl) NTR5113 <http://www.trialregister.nl/trialreg/admin/rctview.asp?TC=5113>

Keywords

blended treatment; smoking; user experience; tobacco; cognitive therapy; patient perspective

Introduction

Health care is undergoing a sea-change driven by the progress in digital technology [1]. One of the interesting innovations is blended treatment – a combination of web-based and face-to-face (F2F) therapy [2, 3]. Blended treatment is a promising eHealth service, because it is expected that the strengths of one mode of delivery will compensate for the weaknesses of the other [3-9]. For example, it is a strength of F2F-treatment to provide the personal attention of a professional which could compensate for the lack of F2F-contact in web-based treatment. In turn, one of the unique features of web-based care is the accessibility anytime and anywhere which could compensate for time between F2F-sessions when patients need support. Up to now there is no final definition for blended treatment [3, 6] and blended treatment is offered in various formats. The literature on blended treatment mentions different modes of delivery (for example mainly web-based [10, 11], mainly F2F [12, 13], 50-50 [14]), different orders (for example sequential [10] or integrated [8, 15]) of F2F-treatment and web-based treatment, and the use of different tools used, such as platforms, emails, short message service text messaging, and apps [5, 16]. The intervention in this study is an integrated 50-50 blend of F2F-treatment and treatment via online platform.

User experience and blended treatment

One of the main elements clarifying the individual's use of services in general [17] and eHealth services such as a blended treatment in particular [18] is user experience (UX). UX refers to what people personally encounter, undergo, or live through while using, interacting with, or being confronted passively with systems [19]. Systems can denote products, services, and artifacts – separately or combined in one form or another – that a person can interact with [20].

Usually, the term UX refers to products, services, and objects that a person interacts with through a user interface [21]. However, for this study, we widened the scope of this term to explore the UX of a service (i.e. blended treatment) that alternately uses computer-mediated communication via a user interface and face-to-face (F2F) communication in counselling sessions.

Although a number of studies examined blended treatment [15], little is known about patients' user experience (UX) with specifically blended treatments. An evaluation study (n=7) of a blended cognitive behavioral treatment for major depression [14] showed that while patients' pre-treatment expectations were mainly neutral and some skeptical patients found it hard to start with the online sessions, most patients appeared to have positive attitudes towards the blended treatment afterwards. Another study [22] (n=14) on internet-based cognitive behavioral therapy for depression supported by short face-to-face consultations found that a sense of relatedness in terms of feeling connected to the therapist and being able to identify with the online treatment may increase patients' adherence to the blended treatment. Both studies suggest that elements of patients' UX such as for example expectations, usability and identification play a role in adherence to a blended treatment and should further be explored.

Patients' UX

For the patients' perspective on the blended care treatment, Hassenzahl's model of UX from a user's perspective was adapted [21, 23-25]. This process-oriented constructivist model defines five key elements and their functional relations (Figure 1). Basically, the model states that while getting in contact with the *features* of a product or service a process is triggered in which the user constructs the UX (this is illustrated by the grey arrow in Figure 1): at the beginning, the user constructs – moderated by the person's *standards and expectations* - an *apparent character* of the product/service. Moderated by the specific usage *situation* the apparent character will then finally mediate a number of *consequences*.

The features of the service (in this case the blended treatment) are chosen and combined by the treatment developers independently of the patients that ultimately follow the treatment. Since the features are therefore not constructed by the users, the product features will only play a minor role in this study. In turn, the focus is placed on the patients' response to the treatment's features to explore the UX from a user's perspective in a narrower sense. This means that the UX from a user's perspective is built by only four of these five key elements: (1) the patient's standards and expectations, (2) the apparent character, (3) the usage situation, and (4) the consequences. In the following paragraphs, each key element is described and illustrated by examples of how the key element applies to the blended treatment of this study.

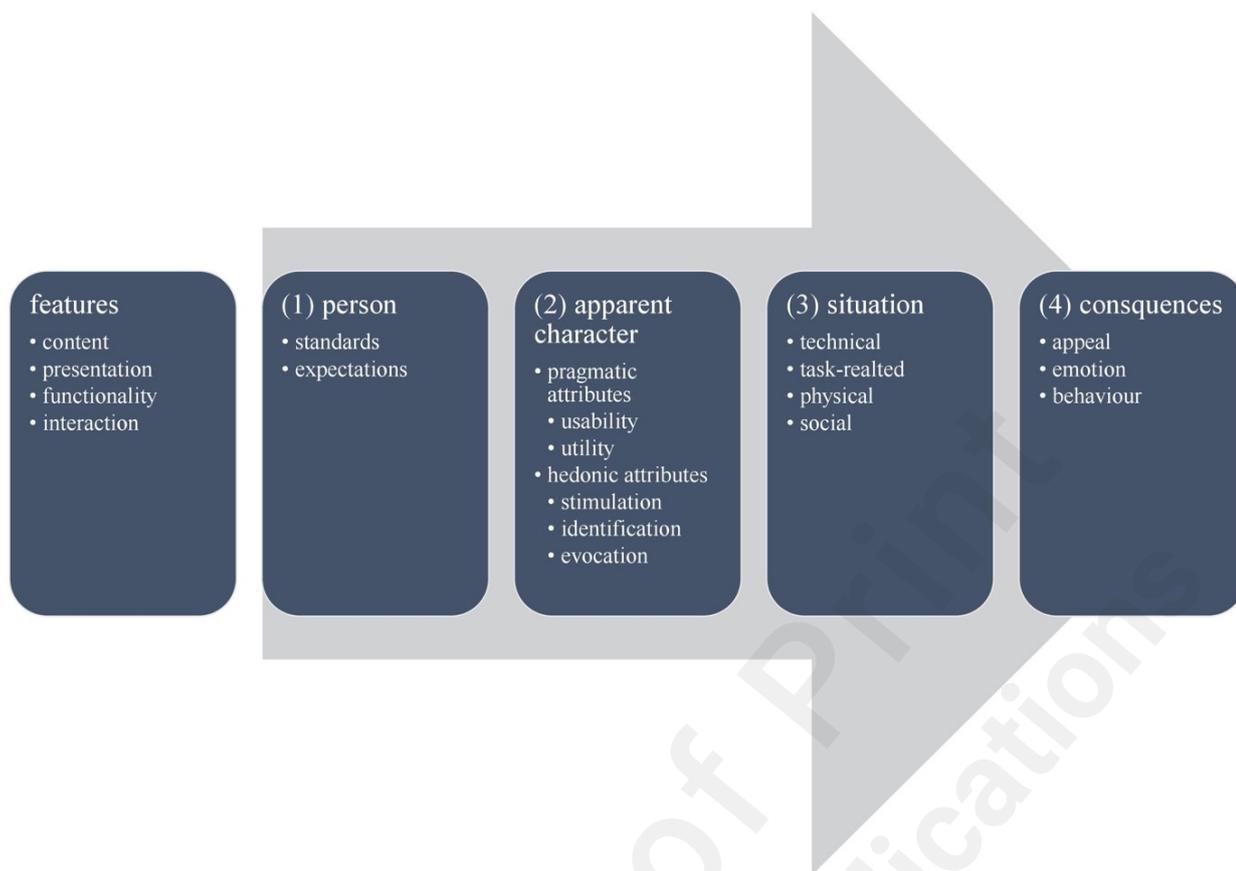


Figure 1. Key elements of the UX model (adapted from [23, 24])

Features

The *features* of a product or service refer to its *content*, *presentation*, *functionality*, and *interaction* [23, 24]. The content of the treatment of this study - Blended Smoking Cessation Treatment (BSCT) – refers for example to the behavior change techniques for smoking cessation [26] that BSCT comprises. Presentation refers to for example the clinical surrounding as BSCT is part of the routine care setting of a hospital. Functionality and interaction refer to for example the face-to-face and web-based sessions which offer synchronous interactions with the counselor (for example functions such as providing feedback on behavior, building rapport) and asynchronous counselor-independent interactions with the web-based system (for example functions such as self-recording of smoking behavior via a web-based smoking diary). More details about the study intervention are provided below in the methods section.

(1) Person

The patients' *standards* and *expectations* are based on their experiences with other services [23, 24] to which the patient can compare BSCT to. If a patient compares BSCT to for example earlier experiences in health care, smoking cessation support, face-to-face treatment, or use of computers and internet, the patient may start BSCT with a subjective standard such as: "Using the computer for treatment is too difficult for me", or with an expectation such as for example "Blended treatment will be more comfortable, because I can partly do treatment at home".

(2) Apparent character

When confronted with a service an apparent character is constructed by the user. The apparent character is a cognitive structure representing *pragmatic* and *hedonic* attributes [23, 24]. Pragmatic attributes refer to the *utility* (for example "supporting", "useful") and *usability* (for example "clear",

“easy to use”) of a service such as BSCT. Hedonic attributes of BSCT refer to *stimulation* (for example “novel and interesting”, “makes me think”), *identification* (for example “my style”), and *evocation* (“reminds me of filling in tax forms”).

(3) Situation

The usage situation moderates the consequences of the apparent character [23, 24] and refers to the *technical*, *task-related*, *physical*, and *social* contexts. These situations are different in-between patients and over the course of the treatment, especially for the web-based session. For example, filling in a smoking diary while being on your own in a silent surrounding may result in different consequences than doing this in the living room with partner and children around you.

(4) Consequences

The fit of the apparent character and the usage situation leads to three consequences: *appeal*, *emotions*, and *behavior* [23, 24]. For patients BSCT for example may appeal as “fine” while feeling “satisfied” and “adhering to the treatment”.

Aims of this study

As UX has shown to be an important factor in explaining user behavior in general [27] and patients’ use of health care services in particular [28], the aim of this study is – from a UX point of view - to explore the question whether in blended treatment the strength of one mode of delivery may compensate for the weaknesses of the other. By applying Hassenzahl’s model of UX to qualitatively describe patients’ UX of a blended smoking cessation treatment (BSCT) in routine care, the question will be addressed which positive and negative experiences patients have with BSCT in general as well as with the F2F-sessions and the web-sessions in particular. This research will contribute to a deeper understanding of facilitators and barriers of blended treatment which will provide new insights for both scientific research on blended treatment and the improvement of clinical practice. In particular, it is expected that the application of the findings on UX elements in the further development of blended treatment will lead to better treatment outcomes.

Methods

Study Intervention

Blended Smoking Cessation Treatment (BSCT) is a clinician-led intervention [1] which combines face-to-face (F2F) and web-based treatment delivered in routine care settings at the Outpatient Smoking Cessation Clinic (Stoppen met Roken Poli (SRP)) of the Department of Pulmonary Medicine at Medisch Spectrum Twente Hospital in Enschede, The Netherlands. BSCT is derived from the Dutch Guideline Tobacco Addiction [29], fulfilling the requirements of the Dutch care module for smoking cessation [30]. The treatment is based on both the F2F-treatment as usual at SRP [31, 32] and web-based treatment at Tactus Addiction Treatment (www.rokendebaas.nl). A team of clinical experts from both organizations developed BSCT striving for a 50-50 mix and a constantly alternating of F2F and web-based treatment by replacing five of the usual ten F2F-sessions with appropriate web-based sessions. This treatment design decision was made with the randomized controlled trial (LiveSmokefree-Study [8]) which compares the effectiveness of BSCT to F2F-treatment as usual in mind. The order, planning, mode of delivery, and main content of the BSCT sessions can be seen in Table 1. The details of BSCT are described in earlier articles, see [8, 15]). To provide an impression of the look and feel of the web-interventions Multimedia appendix 1 shows screenshots of the web-sessions of BSCT.

Table 1. Order, planning, mode of delivery, and main content of the BSCT sessions

Session	Week	Mode of delivery	Content
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1	1	Face-to-face	Goal setting
2	3	Web-based	Measures for self-control
3	5	Face-to-face	Dealing with withdrawal
4	7	Web-based	Breaking habits
5	9	Face-to-face	Dealing with triggers
6	11	Web-based	Food for thought
7	14	Face-to-face	Think differently
8	18	Web-based	Do differently
9	22	Face-to-face	Action plan
10	26	Web-based	Closure

Setting and Participants

The current study is a sub study of the LiveSmokefree-Study - a single-center randomized controlled non-inferiority-trial with parallel group design which examines the effectiveness of BSCT compared to face-to-face treatment as usual. Inclusion criteria for the LiveSmokefree-Study are (1) aged 18 years or older, (2) willing to quit smoking, (3) current daily smoker (at least one cigarette a day), and (4) speaking/reading/writing Dutch.

A purposive sample (n=10) of the participants from the blended arm of the LiveSmokefree-Study [8] that already ended the treatment was selected, striving for an heterogeneous mix of patients regarding the characteristics (Table 2) that were expected to influence patients' UX (i.e. age, sex, education level, adherence, counselor, and quitting success). For recruitment, patients were called by research assistants and invited to participate in the UX-study. Participation was voluntary; patients had to sign an informed consent form and received no incentives.

Ethics

Both the LiveSmokefree-Study and this sub-study on patients' UX were approved by the accredited Medical Research Ethics Committee Twente (P14-37/NL50944.044.14). The LiveSmokefree-Study was registered in the Dutch Trial Registration (NTR5113).

Data Collection

Qualitative data about patients' UX was collected by in-depth semi-structured interviews. The interview guide (Multimedia Appendix 2) was developed following the key elements of UX [23, 24] to elicit both the patients' standards and the patients' expectations towards BSCT, the apparent character of BSCT (usability, utility, stimulation, identification, evocation), the usage situation (technical, tasks, physical, social), and the consequences (appeal, emotions, and behavior). Additional interview questions were created from a clinical perspective addressing practicalities (for example intake procedure, treatment procedures, adherence) and ideas for improvements of the current BSCT.

The interviews were conducted by the first author (LS) between October 2016 and March 2017. Because LS is not a Dutch native speaker, LS was supported by trained Dutch research assistants to eradicate possible ambiguities and to avoid linguistic misunderstandings. At the date of the interview, interviewees were picked up from the waiting area of the SRP and led to a neutral meeting room. After receiving permission for audio recording, the interviewer read a written introduction which emphasized that the patient was invited to recall and describe ("tell stories") about their UX. After this briefing, a general stimulus ("Can you, first of all, tell us what your experiences with the blended treatment are? We would like to hear all the events and experiences that were important to you.") was used to start. Interviews followed a detailed written interview guide (Multimedia Appendix 2), but were open-ended in nature, allowing the interviewers to ask probing questions and to follow up on interesting topics and experiences related to BSCT.

The audio-recordings were transcribed verbatim by trained research assistants following the guidelines for data preparation and transcription as described by McLellan, MacQueen [33] and subsequently analyzed using ATLAS.ti 8.2.4, qualitative data analysis software.

Auxiliary data

Data about the patients' age, sex, education level, internet skills, nicotine dependence, and counsellor (Table 2) was taken from the Live-Smokefree-Study database for which the data was collected using a web-based questionnaire, which the patients filled in at treatment start. An in-detail description of the variables and their measurements can be found in the protocol article of the Live-Smokefree-Study [8]. Patients' characteristics were reported as medians with interquartile ranges (IQR) or as numbers using SPSS version 24.

Data about adherence and smoking status (Table 2) were taken from a dataset build in 2018 for a paper on adherence to BSCT [15]. Based on 18 patient activities that reflect the course of the treatment (for example attending a F2F-session or completing a web-based task), for each patient an adherence score ranging from 0 (non-adherent to any activity after the first treatment session) to 18 (adherent to all activities) was calculated. Patients' adherence rates were reported as medians with interquartile ranges (IQR) using SPSS version 24. Based on a 60% threshold for both the F2F-sessions and the web-sessions [15], patients were classified as adherent or non-adherent to BSCT as a whole. Adherence was also asked in the interviews (see above), which may lead to different assessments (for example patient #25). To examine the self-reported smoking status (stopped smoking: Yes/No), data from both the in-depth interviews and the follow-up web-based-questionnaires of the Live-Smokefree-Study 6-month after treatment start were used. In case that interview data and questionnaire data contradicted each other, interview data were considered superior.

Codebook development

Based on the semi-structured interview guide, content analysis was used to analyze all interviews. The codebook was developed by two research team members (LS, SBA), building on the interview guide and the research goals related to the clinical setting (for example ideas for improvement of BSCT) [34]). Codes were grouped in semantic domains and intercoder agreement was analyzed per semantic domain using the intercoder analysis features of Atlas.ti 8.2.4. Disagreements were discussed and the codebook was revised until acceptable agreement (Krippendorff's $c-\alpha$ -binary 0.650-0.928) for each semantic domain was achieved. The codes, their description and the intercoder agreement per semantic domain are displayed in Multimedia Appendix 3.

Paraphrasing and re-grouping

After coding, all coded Dutch quotes were paraphrased in English by LS and collected in a table (Multimedia Appendix 4). Applying Hassenzahl's model of UX from a user's perspective [23, 24] the semantic domains of the codes were revised by linking the codes to the four of the five key elements which form the UX from a user perspective: (1) patients' standards and expectations; (2) apparent character (pragmatic attributes: usability, utility; hedonic attributes: stimulation, identification, evocation); (3) usage situation (physical, social, technical, task); and (4) consequences (appeal, emotion, behavior). Finally, the user experience was described for each key element distinguishing as far as possible between BSCT in general (i.e. the experience of BSCT as a whole) and the distinction between the two modes of delivery (i.e. the F2F-sessions and the web-sessions). Furthermore, in describing the UX, an attempt was made to make a distinction between positive and negative user experience, which is based on the idea that UX foremost is a "primarily evaluative feeling (good-bad) while interacting with a product or service" [25]. Ultimately, we summarized the variety of consequences in three kinds of combinations of consequential appeals, emotions and behavior.

Results

In the following, the patient characteristics are presented first. Then the positive and negative statements for each key element are described. As far as possible, this is done first for BSCT in general and then for F2F-sessions and web-sessions respectively. Note: Since the analysis and presentation method was clarified after the interview phase, statements are not always available for every area.

Participants

Patients' characteristics are shown in Table 2. Median age of the patients was 59.0 (IQR 43.0-68.8) and the majority were males (7/10). Half (5/10) of the patients' educational level was lower than vocational education and training. The median internet skills level (range 10-50, higher numbers indicate higher skills [8]) was 38.0 (IQR 35.5-40.0), median nicotine dependence (Fagerstroem, range 0-10, higher numbers indicate higher dependency [35]) was 5.5 (IQR 3.8-7.0).

Table 2. Purposive sample

Randomization number	#10	#12	#14	#25	#27	#34	#53	#75	#106	#509
Age ^a	77	54	68	71	37	45	60	65	37	58
Sex ^b	m	m	m	f	f	m	m	f	m	m
Education level ^c	Low	Mid/ High	Mid/ High	Low	Low	Mid/ High	Low	Mid/ High	Low	Mid/ High
Internet skills ^d	28	34	37	38	38	46	36	40	40	39
Nicotine dependence ^e	5	7	4	6	7	4	3	2	7	6
#Adherence F2F ^f	3	4	6	5	2	3	5	2	8	2
#Adherence Web ^g	3	2	8	2	0	3	6	9	7	2
#Adherence BSCT ^h	6	6	14	7	2	6	11	11	15	4
Adherence F2F ⁱ	N	N	Y	Y	N	N	Y	N	Y	N
Adherence Web ^j	N	N	Y	N	N	N	Y	Y	Y	N
Adherence BSCT ^k	N	N	Y	N	N	N	Y	N	Y	N
Counselor ^l	A	B	B	B	B	A	A	C	C	B
Stopped smoking ^m	Yes	No	Yes	No	No	No	Yes	No	Yes	No

^aAge, years;

^bSex, m=male, f=female;

^cEducation level, VET=vocational education and training (Low=lower than VET; Mid/High=Vet or higher);

^dInternet skills (range 10-60; higher number indicates better skills);

^eNicotine dependence, Fagerstroem (range 0-10, higher numbers indicate higher nicotine dependency);

^f#Adherence F2F, adherence to F2F-sessions (range 0-8, based on the 8 activities belonging to F2F sessions; higher number indicates higher adherence);

^g#Adherence Web, adherence to web-sessions (range 0-10, based on the 10 activities belonging to web-sessions; higher number indicates higher adherence);

^h#Adherence BSCT, adherence to BSCT in general, sum of #Adherence F2F and #Adherence web (range 0-18; higher number indicates higher adherence);

ⁱAdherence F2F, categorical classification of adherence to the F2F-sessions based on a 60%-threshold (Y= adherent; N=non-adherent);

^jAdherence Web, categorical classification of adherence to the web-sessions based on a 60%-threshold (Y= adherent; N=non-adherent);

^kAdherence BSCT, categorical classification of adherence to BSCT in general based on a 60%-threshold (Y= adherent; N=non-adherent);

^lCounselor, who carried out the treatment

^mStopped smoking, self-reported abstinence;

(1) Patients' standards and expectations

The patients approached BSCT in general mostly with a positive-pragmatic standard and a neutral-open expectation. None of the patients followed a blended treatment or a web-based treatment before. Therefore, their standards and expectations were based mainly on earlier experiences with

F2F-sessions, with earlier stop-smoking attempts, and with ICT-use in general. Only one patient (#34) used health-apps (Mindfulness, Stoptober). However, most of the patients (7/10) received F2F-counseling before, did a group therapy (#34), or were familiar with mindfulness (#34, #53).

For *F2F-sessions*, positive standards predominated. Patients said for example that “Human touch is important” (#75), that quitting is easier with F2F-support (“with help stopping will be easier” (#53, #14)), that F2F-treatment is “ideal”, and that it “adapts to your competences” (#12). One patient, however, considered that it “can be hard if you dislike the counselor” (#14).

Building amongst others on *earlier stop smoking attempts*, patients had the standard that the quitting success may depend on themselves (reporting for example “Stopping you have to do for yourself.” (#12); “Treatment only makes sense if you have the will to stop” (#14); quitting is “more a mental than a physical problem” (#27); “You have to be strong” (#27); or “You just have to do the things” (#53)), on missing support (“With help stopping will be easier” (#53, #14), and on stress (“Relapses are caused by stress” (#10, #34, #75)).

For *ICT-use in general*, while being familiar with using ICT (for example searching the web, using email/WhatsApp), the majority of patients showed a pragmatic standard (“Computer is a tool” (#509, #75); “I am not a computer freak” (#12); “Computer is not my way” (#10); or “I am neither a forerunner nor a left behind” (#25). Only one patient (#34) reported that he “personalizes his mobile”. Most patients also emphasized that they do not prefer computer-mediated communication over F2F-communication, because it “leads to misunderstandings” (#53), “it is easier to cheat online” (#34, #12), “it is easier to do sloppy” (34), “online information is not as important as written on paper” (#25), or “I do not trust internet information” (#509). Three of the patients (#106, #27, #25) reported that they use mobile devices (smartphone, tablet) more often, for example “I use the laptop less since I have a tablet” (#25) or “I prefer mobile over PC” (#27).

Referring to *BSCT in general*, most patients (#106, #34, #27, #75, #25) described their *expectations* as “neutral” or “not clear”, while some (#53, #34, #10) emphasized to expect support from BSCT, saying for example that they want the counselor to be “a driving force” (#10) or that they expect “to get more grip on smoking cessation” (#34). One patient (#14) remarked that BSCT “is new and sounds interesting”.

(2) Apparent character of BSCT

While being confronted with BSCT and moderated by their standards and expectations, the apparent character of BSCT which the patients constructed, seemed to be both positive and negative. The *pragmatic attributes (usability, utility)* were experienced mostly positive while the *hedonic attributes (stimulation, identification, evocation)* - especially for the web-sessions- tended to be negative.

Pragmatic attributes of BSCT

BSCT’s pragmatic attributes (*usability* and *utility*) were experienced as good. However, some patients also criticized pragmatic aspects of BSCT, especially of the web-sessions, which indicated possibilities for further improvements.

Usability

Most patients experienced the *usability of BSCT in general* as positive - reporting for example that the “intake was good” (#75, #10, #14), “there have been no problems” (#509), “everyone was kind” (#34) “everything was clear and easy to use” (#53), “all was quite logical” (#14), the “treatment was picked up well” (#53, #27, #10), “BSCT parts connected to each other” (#106, #75, #14), and that “the intervals between sessions were fine” (#53). One patient (#14) reported “less travelling” (Note: BSCT patients only had to attend 5 F2F-sessions at the clinic, compared to 10 F2F-session in the F2F-treatment at usual) as an advantage of BSCT while another patient (#10) found that “still having to travel to the hospital at all” is a disadvantage. Further negative aspects of usability reported were the “long waiting list” before treatment start (#14, #12) (Note: regular waiting time before treatment start was around two months), “the long waiting times” in the waiting area before start of a F2F-session (#14), that it was “not clear where to turn to outside the office hours” (#14), that “intervals between sessions were too long” (#10, #25), and that “not everything was explained in detail” (#25) and that the patient was “surprised about the order of sessions” (#25).

The *usability of the F2F-sessions* was experienced as “easy” (#25) or as “easier than web” (#27). Yet some patients criticized “that the counselor did not have enough time” (#12, #10, #14) or that the sessions were “slow and time

consuming” (#27, #14).

Six patients (#509, #106, #53, #27, #75, #14), experienced the *usability of web-sessions* as “easy to use”, while three patients (#34, #10, #25) reported the opposite (“not easy to use”). Patients criticized that the web-sessions were “too time demanding” (#509, #106), that there was “a lot of repetition” (#10, #53, #27, #14), that they “did not get immediate response” (#14), that they “did not receive online assignments” (#27), and that “login would have been easier if you do not have to remember your password” (#27). Furthermore, two patients (#509, #106) reported that they did the smoking registration on paper before doing it online because “it was simpler” (#106). However, this was “double work” (#106). Yet patients liked “to be notified about new web-content automatically” (#75), that “emails and phone calls raised awareness” (#34), that “filling in forms online was handy” (#34), and that “online saved time” (#25).

Utility

With regard to the *utility of BSCT in general*, the patients experienced the utility as positive, finding that “all BSCT parts were helpful – some more, some less” (#53), that BSCT “matched my quitting process” (#53), that “all has been discussed” (#106), that “there was progress” (#106), that BSCT “offered support” (#27), or that “web only would not have offered what I needed” (#75).

The *utility of the F2F-session* was experienced as positive by the majority of patients (7/10) also. Patients reported that F2F “offered flexibility” (#75), that “I could talk to the counselors about all of my problems” (#509), that “all has been discussed” (#14), that F2F “it was easier to ask questions” (#14), that F2F “you got direct answers” (#14), that F2F “stimulated more than web” (#10), and that F2F “with medication was better than medication only” (#106). The counselors “reinforced” (#53, #25), “stimulated” (#53, #14, #10), “offered support” (#53, #25, #14), “shared good metaphors” (#53), and “explained everything very well” (14). Three patients experienced the F2F-session as not useful, saying that the counselors “did not offer enough support” (#34, #27, 12), “did not reinforce” (#12), “did not motivate” (#12), “did not discuss all alternatives” (#34), and “asked too much questions” (#27).

For the *utility of the web-sessions*, there were both positive and negative experiences. Some patients had a predominantly negative experience saying that “reporting via web was too time demanding” (#509), that web “offered too much information” (#106), that web “did not match my quitting process” (#27, #14), that “a computer does not answer” (#14) and that web “does not work for me” (#75). Furthermore, ideas for improvement were reported such as “an App would be better than web” (#34) and other services should be included such as “short reinforcements via WhatsApp, Emails in-between sessions, video instructions, helpdesk, chat support, short instructions” (#34) and “audio information” (text to speech) (#27). However, patients also reported positive experiences saying that web “offered support in difficult moments” (#53), that web “offered tips” (#53), and that “it was good to have information available online” (#27, #14, #34).

Hedonic attributes of BSCT

For the hedonic attributes (*stimulation, identification, evocation*), BSCT was experienced both positively and negatively. While some patients felt *stimulated* by BSCT, others reported being demotivated. Especially for the web-sessions, most patients reported low *identification*. Also, the web-sessions *evoked* mostly negative comparisons and induced several ideas for improvements.

Stimulation

Patients reported both positive and negative stimulation by *BSCT in general* and rather low stimulation referring to the *F2F-sessions* and *web-sessions*.

For *BSCT in general*, patients – on the one hand - felt stimulated to “quit smoking” (#14), to “discuss costs of smoking” (#12), to “think” (#106, #34), to “dig deeper” (#509), or to “look back” (#75). And, patients also reported that the carbon monoxide measurements during the F2F-sessions stimulated quitting (#53, #12). On the other hand, patients reported that “BSCT did not offer new things” (#34) or was “not interesting” (#14) and that certain interventions (i.e. dealing with tempters) were “not new” (#25). Furthermore, patients were demotivated by “always the same questions” (#27), by “digging too deep” (#27) and by contradictory goals (quitting smoking vs. weight reduction) (#27).

For the *F2F-sessions*, patients said that the “counselor had no impact” (#27, #12, #14, #25). However, some patients (#12, #509, #34) reported to be reinforced by the counselors to use the web-sessions.

For the *web-sessions*, one patient said, that web “broadened your awareness” (#75), whereas the majority of patients reported no or low stimulation saying that “online won’t get through to me” (#53, #34, #14, #25), “online exchange with the counselor did not affect extraordinary” (#25, #509), and to be demotivated by the web-sessions (#10, #509) or computer use (#106).

Identification

For *BSCT in general* patients could identify linking to individual features such as for example “perseverance” or “self-control”. However, for the web-sessions, most patients reported low identification. The ones showing higher identification with the web-sessions did this referring to the personal contact with the counselor. In line, patients identified easier with the *F2F-sessions* than the *web-sessions* of BSCT.

Related to *BSCT in general* patients reported that BSCT linked to individual features such as “perseverance” (#75), “self-control” (#75), “the ability to work based on reading and writing” (#75), “IT-skills” (#10), and “age” (#10). However, one patient (#27) reported that she “felt treated like a child” and that she “lost her rhythms”.

For the *F2F-sessions* patients reported that these “felt more familiar” (#106), that patients liked “the F2F-sessions the most” (#53) and “talking to the ladies” (#10) (Note: by this the male patient (#10) refers to the female counselors).

For the *web-sessions* most patients reported low identification, saying “I don't feel like it much” (#106) or “not to like online” (#106, #10), that “online is not my style” (#12, #75, #10, #25), to “prefer on paper” (#25), or being “too stupid for IT” (#10). One patient (#75) showed a higher identification with the web-sessions, emphasizing “web I did for myself”, “I know why I did web” and “I understood the process”. In turn, she criticized that “online did not give the opportunity to make it more personal” (#75). Three patients reported that the web-parts supported their personal contact with the counselor mentioning that via web-parts “I had contact with her” and “they knew something about me” (#509), that “during the F2F-sessions it became clear that the counselor reads the web-content“ (#25), that “I had the idea that it is used on the other side” (#53), and that “you knew there is someone behind it” (#34). In turn, three patients reported that “you didn’t know who has written the content” (#15), that “computer did not talk to you” (#12, #14), and that “you did not get the feeling that there is a human being on the other side” (#12).

Evocation

For the *web-sessions* the patients reported several negative comparisons such as “web was like handling a machine, because you are not sitting opposite to each other” (#106), web-sessions were like “bookkeeping” (#53, #34, #14), like “a manual” (#53), like “filling in tax forms” (#10), and like “paper” (#27).

(3) Situation

For the usage situation, mostly the *technical* context had a negative impact on the UX. Especially the *web-sessions* were depending on technical factors which were criticized. Furthermore, referring to the *task* context of *BSCT in general*, some patients reported not having enough time for the treatment. Both the *physical* and the *social* context were described as mostly positive.

Technical

For the technical situation, patients referred to the *web-sessions*, criticizing that web “did not work on iPad” (#34, #10, #25, #75). Although patients had been informed at start of the treatment that the software for the web-session could not be used on tablet computers, patients would have preferred to use tablets, because “Tablet is always on, Laptop not” (#34, #75, #14, #25) and tablet “is more comfortable” (#10), or because they (#10, #25) moved from laptop to tablet during BSCT. Furthermore, for the use of computers for the web-sessions, patients criticized that they “had to start up the laptop, which takes time” (#106, #34, #14).

Task

Referring to tasks, patients reported not to have enough time for the BSCT “because of other tasks” (#509) or “because of family tasks” (#106), or to feel “sometimes stressed – sometimes relaxed” (#27).

Physical

For the *F2F-sessions*, patients reported little about the physical usage situation, mentioning only “that I live close to the hospital” (#25) and “that the treatment took place in the old building, which was not a nice place” (#34, #27) (Note: Between the patients treatment and the interviews the department moved to a new building).

For the *web-sessions*, the patients shared more information about the physical usage situation reporting that they did the web-sessions at “my own home office” (#25, #509), in a “hobby room upstairs, which is a nice place” (#10), “upstairs, where it is quite hot in the summer” (#14), “with the laptop at the dining table with wife and children around me” (#53), “in the kitchen” (#106), and “with laptop lying on the bed in the sleeping room” (#509).

Social

For the social situation during *BSCT in general*, most patients reported feeling supported by the family, saying that everyone “supported” (#53, #25) and “complimented” (#53), that “family motivated stopping” (#106) and “nearly no one in our family smokes” (#14), that “my partner stimulated” (#509, #10), “offered incentives” (#14, #53), “accompanied” (#14), “gave feedback on better health conditions” (#53) and “does not smoke” (#509), and that “children supported” (#27), “children were positive about quitting” (#53) and “my son also quit” (#14). One patient (#25) “lives alone” and “did not tell much about BSCT”; she reported that “everyone was sceptic of the quitting success”. And one patient (#27) reported that “her partner did not support”, “questioned the web-sessions” and broke “the agreement to smoke outside only”.

For friends and colleagues, patients reported that “none of my friends smoke” (#10), “no one smokes inside” (#14), and that “colleagues also have positive experiences with cessation treatment” (#53). Furthermore, one patient emphasized that he “stimulates others to quit smoking” (#10).

(4) Consequences

Overall, *BSCT in general* had a positive *appeal*, while *emotions* (for example “satisfaction”) varied. Again, there was clear distinction between the *F2F-sessions* and the *web-sessions*. Similar to the emotional consequences, the behavioral consequences (*adherence, quitting*) varied also, ultimately resulting in diverse combinations of consequential appeal, emotions and behavior.

Appeal

For six patients (#106, #53, #27, #75, #14, #25) *BSCT in general* appealed to be “good “. Patients reported that BSCT was a “mix of talking and reading” (#14) and it “offered variety” (#75). The “shared information both F2F and web was fine” (#106) and “web only would not have been so easy” (#53). F2F-sessions and web-sessions were “quite different” (#34); “sometime F2F was better – sometimes web was better” (#14) and “web was an extension of F2F” (#53). Saying “Champix was good”, one patient (#27) emphasized the medical treatment.

The *F2F-sessions* mostly appealed to be “good” also. Patients reported that the F2F-sessions were “fine” (#509) or “finer than web” (#106) and that the F2F-sessions were “most important” (#53) or “most important at treatment start” (#34). One patient (#12) emphasized “that only F2F touches your heart” and that he would go for F2F “100% in all facets”. However, one patient (#27) said that the F2F-sessions were “whiny”. For the counselors, one patient (#27) described her counselor as “nice”, while another patient (#34) said that his counselor had a “stiff posture” and that she was “annoying”, “pedantic” and “cumbersome”.

For the *web-sessions*, the majority of patients reported a negative appeal, saying that the web-sessions “yielded nothing” (#509, #75, #14), were “a lot” (#509, #27), “cumbersome” (#106), “boring” (#34, #27), “tiring” (#27), “nonsense” (#12, #10), and “dead” (#10). However, one patient (#75) said that “web was nice” while others – also referring to positive appeal – reported that the web-sessions could be done “comfortable at home” (#34) and that web was “a serious matter” (#25), although she would not go for “web only”.

Emotion

Emotional consequences varied – some patients were satisfied with *BSCT in general*, some not. Again, there was a distinction between *F2F-sessions* and *web-sessions*, but not as clear as for the appeal.

While two patients (#34, #25) said that they were not satisfied with *BSCT in general*, three patients reported to be satisfied (#27, #10) or “thankful” (#106). Furthermore, referring to negative emotions about BSCT in general, patients reported “feeling abandoned, left alone” (#12), “tension and the need to relax physically” (#75), and “contradictions between quitting smoking and weight reduction” (#27). One patient said that F2F-sessions and web-sessions stimulated “the same moods” (#25). The mood during the *F2F-sessions* was “good” (#53, #27), while *web-sessions* were experienced as “unpleasant” (#27) and “making me nervous” (#34). One patient reported to feel “guilty because I did not stick to appointments” (#27).

Behavior

During the interviews, three patients (#14, #53, #25) reported that they *adhered* to *BSCT in general* doing both the *F2F-sessions* and the *web-sessions*. One of them (#14) saying he “could have stopped after four sessions” because he was “sure not to need it in the future”. However, he continued BSCT “to do the counselors and researchers a favor”. Five patients (#106, #34, #27, #10, #25) reported that they did the *web-sessions* “sloppy”. Furthermore, one patient (#27) mentioned that she “forgot about some of her sessions”.

Based on the auxiliary data (Table 2), medium adherence to *BSCT in general* (range 0-18, higher number indicate higher adherence) was 6.5 (IQR 5.50-11.75). Based on a 60% threshold for both the *F2F-sessions* and the *web-sessions* [15], three patients (#14, #53, #106) were classified as adherent to BSCT in general. One patient (#75) was classified as adherent to the *web-sessions* but not to the *F2F-sessions*, while another patient (#25) – one of the patients who reported to be adherent to BSCT in general during the interview - was classified as adherent to the *F2F-sessions* but not to the *web-sessions*. Five patients (#509, #34, #27, #12, #10) were classified as non-adherent, because they neither adhered to the *F2F-sessions* nor to the *web-sessions*.

Based on the interviews and the auxiliary data, four patients (#10, #14, #106, #53) reported successful *quitting*. One (#106) mentioned “I had no problems because I had medication (Champix)” and “I threw away my last shags”. The other one (#53) mentioned that he told himself “Never again!” and “Enough!” (Basta!), and that “he saved money for the holidays with his family”. Two patients (#75, #509) reported that they reduced smoking during BSCT.

Combinations of consequential appeal, emotions and behavior

The variety of consequential appeals, emotions and behavior could be summarized in three types of combinations: “positive”, “negative”, and “mixed” consequences.

Three patients (#14, #53, #106) experienced “positive” consequences: BSCT appealed to be good and they felt “satisfied”/“thankful”, adhered to the treatment and quit smoking.

In turn, another three patients (#12, #34, #509) experienced “negative” consequences: The *web-sessions* appealed negative (“nonsense”, “boring”, “yielded nothing”) and BSCT in general resulted in negative emotions (abandoned/not satisfied). Ultimately, they did not adhere to the treatment and did not quit smoking.

Mixed consequences: Three (#25, #27, #75) of the four remaining patients did not quit smoking, while one (#10) did. Interestingly, BSCT in general appealed “good” to the non-quitters (#25, #27, #75) while – in turn - for the quitter (#10) at least the *web-sessions* appealed to be “nonsense”. Although two of the non-quitters (#25, #75) reported negative emotions (“tension”/“not satisfied”), these two patients at least partly adhered to BSCT (#25 adherent to *F2F-sessions*; #75 adherent to *web-sessions*). In turn, the third non-quitter (#27) reported positive emotions (“satisfied”) but did not adhere at all.

For the remaining quitter (#10), although *web-sessions* appealed to be “nonsense” and he did not adhere to BSCT in general, he reported positive emotions (“satisfied”) and ultimately quit smoking.

Discussion

Principal Findings

This study aimed to provide insight in the user experience (UX) of a blended treatment. In the light

of this study, the expectation that in blended treatment the strength of one mode of delivery can compensate for the weaknesses of the other, can be partially supported, because the F2F-sessions compensated for the weaknesses of the web-sessions so that BSCT in general ultimately was experienced mostly positively.

Our study described the UX of a Blended Smoking Cessation Treatment (BSCT) using Hassenzahl's key elements of UX from a user's perspective [23, 24]. Overall, BSCT in general appeared to be a mostly positively experienced service. Patients had a positive-pragmatic standard and neutral-open expectation towards BSCT in general at treatment start, and the pragmatic attributes of the F2F-session were mostly perceived as positive while the pragmatic attributes of the web-sessions were perceived as both positive and negative. For the hedonic attributes, there seems to be a difference between the F2F-sessions and the web-session. Specifically, the hedonic attributes of the web-sessions were experienced mostly negative, while in turn the hedonic attributes of the F2F-sessions were mostly positive. For the usage situation, the physical and social context was experienced positively while the task and technical context was experienced negatively. Nevertheless, the consequential appeal of BSCT in general was positive. However, the consequential emotions and behavior varied, ultimately resulting in diverse combinations of consequential appeal, emotions and behavior (positive, negative, and mixed).

Although patients' pre-treatment expectations towards BSCT were neutral and the web-sessions appealed negative, overall BSCT in general appeared to be positively experienced afterwards. This is in line with an evaluation study (n=7) by Kooistra et al. [14] of a blended cognitive behavioral treatment for major depression. However, our study provides a more differentiated insight in why the web-sessions were appraised negatively. Applying Hassenzahl's distinction between pragmatic and hedonic attributes [23], our findings suggest that while patients experienced the pragmatic attributes (usability, utility) of the web-sessions in general as more positive, the negative hedonic attributes (stimulation, identification, evocation) of the web-sessions led to a combination of negative consequences such as negative appeal, negative emotions, and low adherence.

Interestingly, although the hedonistic gap made the web-sessions appeal negatively, overall BSCT was experienced positively. This could support the assumption that in blended treatment the strength of one mode (i.e. F2F) may compensate for the weaknesses of the other (i.e. web) [4, 5]. This is further supported by our findings about relatedness and identification which are in line with a qualitative study (n=14) by Wilhelmsen et al. (2013) on internet-based cognitive behavioral therapy for depression supported by short face-to-face consultations [22]. The three of our patients that adhered to BSCT and ultimately quit smoking showed rather low identification with the web-sessions but had a positive appeal and positive emotions towards BSCT in general, especially towards the F2F-sessions. This positive overall appraisal may have cancelled out the negative appeal of the web-sessions.

We mainly found that F2F-sessions compensated for the weaknesses of the web-sessions. Yet three patients reported that the web-sessions influenced their personal contact with the counselor positively. Although the web-sessions mostly had a low identification and a negative appeal, the web-sessions supported the F2F-session because these patients felt more related to the counselor. However, even though the web-sessions may have supported the F2F-sessions, it should be noted that none of the patients indicated that web-sessions compensated for F2F-sessions. It remains undecided if this is due to the fact that there was no need for compensation because the F2F-sessions were overall positive, or that web-sessions were not able to compensate. It should also be taken into account that routine care in the hospital is not web-based, that patients were higher aged and not web-affine (although they reported to have sufficient internet skills), and that patients' preferences for modes of delivery have not been taken into account as they were not free to choose for BSCT, because they were included in a randomized controlled trial. These factors may additionally explain the low positive impact of the web-sessions.

The emotional and behavioral consequences varied, ultimately resulting in three types of combinations of appeal, emotions (for example satisfaction) and behavior (adherence; quitting): "positive", "negative", and "mixed". These types can be used to work on UX profiles that support the further development of blended care and improve matching between treatment and patient [3].

Implication for Future Research and Clinical Practice

Further work needs to be done to investigate how the integration of F2F- and web-treatment can be carried out to ultimately increase the effectiveness and efficiency of a blended treatment. This study provides a hint to explore this question by emphasizing the relevance of hedonic attributes in user experience. Even if the UX was predominantly positive because the hedonistic gap in the area of the web-sessions was compensated relatively easily by the F2F-sessions, this does not mean that BSCT cannot be further improved in order to increase adherence and long-term abstinence. Hedonism could be a starting point for this. Further research on the following questions could be useful.

Could the hedonistic gap in the web sessions not only be due to the mode of delivery, but also to the concrete content of the web sessions? Perhaps it was precisely the interventions that the patients experienced as non-hedonistic that were part of the web sessions. This was neither explicitly considered in the treatment design nor asked for in detail in the interviews. But this might have been the case, because the more standard exercises and messages could be offered online more easily. A stronger involvement of patients in the early design stages of the web-sessions may help to prevent the hedonistic gap.

May hedonism play a less prominent role in the health care context than in other domains? Patients tend to approach a health problem with a pragmatic-neutral expectation such as for example “What’s important is that it works. As long as it helps, I can also accept that it is unpleasant.”. Consequently, hedonistic aspects such as fun, enjoyment, pleasure, and aesthetics may not be expected in the first place, and therefore may not be missed. Moreover, this may be compensated relatively easily by positive experiences with the counselors. However, if hedonism were less important in health care, it would contradict our conclusion that it should receive more attention.

Could both scientific research and clinical practice use insights from persuasive systems design [36, 37], “nudging” [38], and “Funology” [23, 24] to address the hedonic gap which may negatively influence smoking cessation patients which are usually a highly motivated target group [39]? Persuasive design features such as primary task support (for example tailoring, personalization), dialogue support (for example rewards, liking), credibility support (for example real world feel), and social support (for example normative influence, competition) as well as hedonic aspects such as fun, enjoyment, pleasure, and aesthetics may play a role in sustaining patients motivation to adhere to the treatment and to quit smoking.

How do the apparent character and the consequential appeal and emotions relate to the quitting behavior? On the one hand, apparently a negative appeal (i.e. missing hedonic attributes) may lead to consequential combination of negative appeal, emotions and behavior (i.e. neither adhere nor quit). On the other hand, it is also possible to distinguish between diverse episodic user experiences ultimately leading to a cumulative UX [20]: for example, a motivated patient may start with a positive user experience, but after failing to quit or relapsing the patient’s standards and expectations may change during treatment which then leads to a negative appeal and ultimately to a cumulative negative UX. The cumulative UX would then not be the result of a linear process as in the model of Hassenzahl (Figure 1). Rather, in a circular process, consequences (i.e. quitting), apparent character, and expectations and standards would influence each other.

Strength and Limitations

The data and model used in this study provided a rich insight in the UX of a blended treatment for smoking cessation in an ambulant clinical setting. Though this study yielded valuable knowledge for the understanding and improvement of BSCT and the matching of patients and treatment, limitations should be noted when interpreting the findings. First, the sample of patients used in this study was a purposive sample which intended to represent the heterogeneity of the patients of an outpatient cessation clinic. Hence, it is uncertain, if the rather small sample (n=10) is representative for the population referring to characteristics such as for example sex, age, internet skills, or educational

level, and if thematic saturation was reached with this sample. It should also be considered that patients did not choose BSCT on their own but were randomly assigned to BSCT because they participated in a randomized controlled trial. However, the high degree of consensus in the findings may indicate generalizability of our main conclusions. Secondly, the interviews were conducted retrospectively. Conducting additional interviews at treatment start and during treatment could have offered a more valid insight in the process of patients' UX construction (for example for the standards and expectations and for the apparent character). Thirdly, the software that is used for the web-sessions, was developed around 2005, which may have led to technical inconveniences (for example web-software is "Flash"-based and non-responsive; not smartphone/iPad-compatible) which may have negatively impacted the UX. This assumption is based on the fact that patients often stated that they would have liked to do the web-sessions on their smartphone/iPad. We assume that a newer smartphone/iPad compatible software with similarly good pragmatic attributes as the previous Flash-software might also improve the hedonistic attributes and thus lead to more positive consequences. Fourthly, the interviews were conducted with the first patients that followed the new blended version of the smoking cessation treatment. At that time the treatment still had some teething troubles such as being new for the originally face-to-face counselors. We did not integrate counselors' views on the uptake of BSCT and therefore we cannot compensate for bias through inadequate treatment fidelity. Fifthly, as long-term abstinence is the ultimate goal of a smoking cessation treatment, a prolonged follow-up analysis of patients' UX could reveal a different picture. For example, some patients may continue using the web-based modality and benefit from this at a later stage, resulting in a UX more in favor of the web-based treatment. Conversely, relapse to smoking at a later stage may lead to a negative adjustment of the UX of the blended treatment as a whole. Sixthly, we could not elaborate further on which specific parts of the web sessions in particular were experienced positively or negatively, as we did not ask for this in detail in the interviews. Seventhly, the study interventions are chosen and combined by the researchers and treatment developers independently of the patients that ultimately follow the treatment. This resulted in a rather inflexible approach of blending (five web-based sessions and five face-to-face sessions in a fixed sequence and with equivalent content) to allow for comparability with the F2F-treatment as usual in the randomized controlled trial (LiveSmokefree-study [8]). This inflexible approach is due to the research design and may limit the potential of blending. In daily practice blending web-based and face-to-face intervention may lead to a flexible exchangeability of all intervention components, which would foster a treatment that is highly tailored to the patient's needs and abilities and by this leads to a different UX.

Conclusions

This study provides insight in the key elements of the user experience of a blended treatment for smoking cessation and supports the expectation that in blended treatment one mode of delivery may compensate for the weaknesses of the other. However, in this certain setting, this is mainly found in only one way: F2F-sessions compensate for the weaknesses of web-sessions. As a practical conclusion, this may mean that the web-sessions, as they are supported by the strength of the F2F-sessions, offer an interesting approach to further improving blended treatment in this specific context. Our theoretical findings reflect the relevance of aspects of hedonism such as for example fun, joy or happiness in UX [23], which were not mentioned in relation to the web-sessions and only scarcely in relation to the F2F-sessions. Future research should further investigate the role of hedonistic aspects in blended treatment and if increased enjoyment of blended treatment could increase treatment adherence and ultimately effectiveness.

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Authors' Contributions

LS, SBA, MGP, MGJBK, MEP identified the study questions and designed the study. LS is principal investigator and wrote the first draft of this manuscript. LS, SBA, MGP, MGJBK, MEP and RS edited this manuscript. LS, SBA, and MGP revised the manuscript. All authors approved the final version of this manuscript for publication.

Ethics

In line with the Dutch Medical Research Ethics Committee (MREC) guidelines the study was approved by the accredited MREC Twente (P14-37/NL50944.044.14). Before initiation, the study was registered with the Dutch Trial Registration (NTR5113). All patients had to sign an informed consent form before they were randomized.

Conflicts of Interest

The authors declare that they have no competing interests.

Abbreviations

BSCT: Blended Smoking Cessation Treatment

F2F: face-to-face

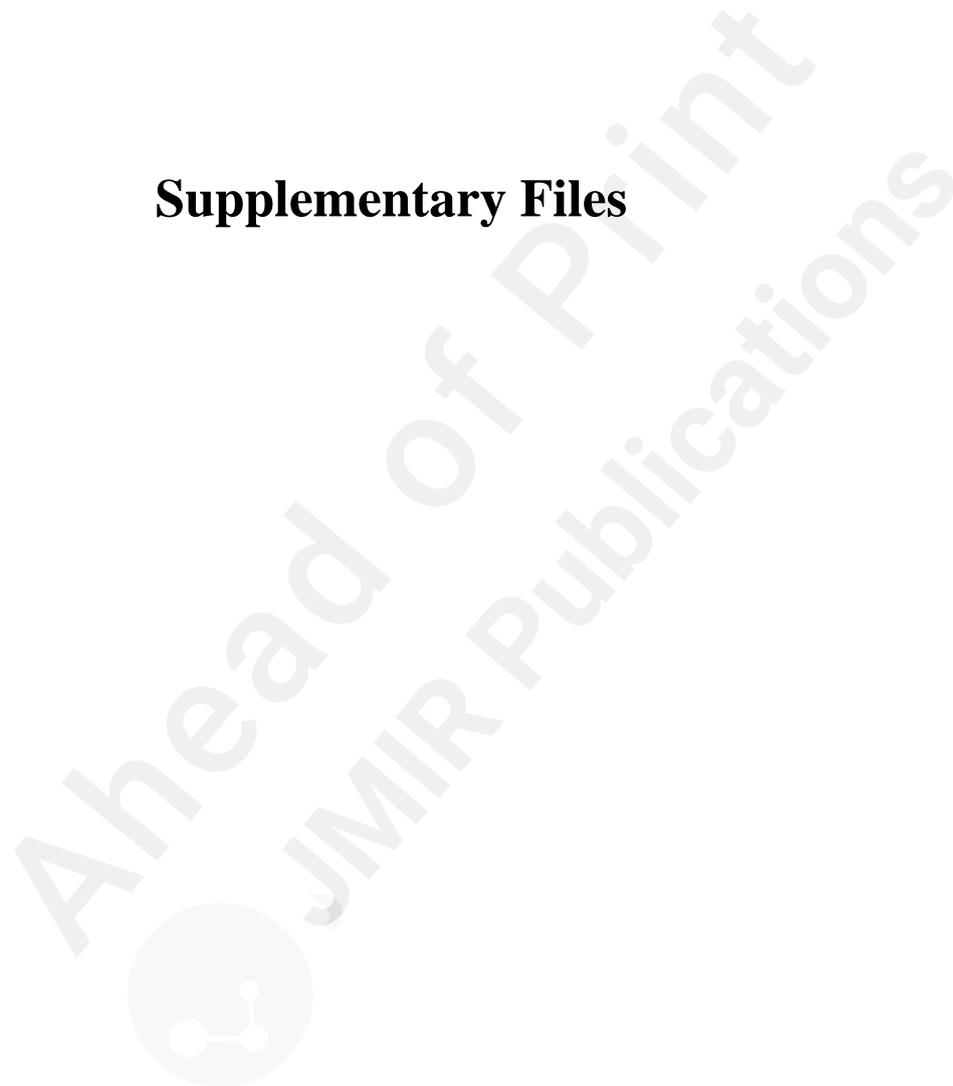
IQR: interquartile range

SRP: Outpatient Smoking Cessation Clinic (Dutch: Stoppen met Roken Poli)

UX: user experience

Literature

Supplementary Files



Multimedia Appendixes

Blended Smoking Cessation Treatment user experience Interview Guide (Dutch).

URL: <https://asset.jmir.pub/assets/fe4223eac896be0e78fb44636a3e17d0.pdf>

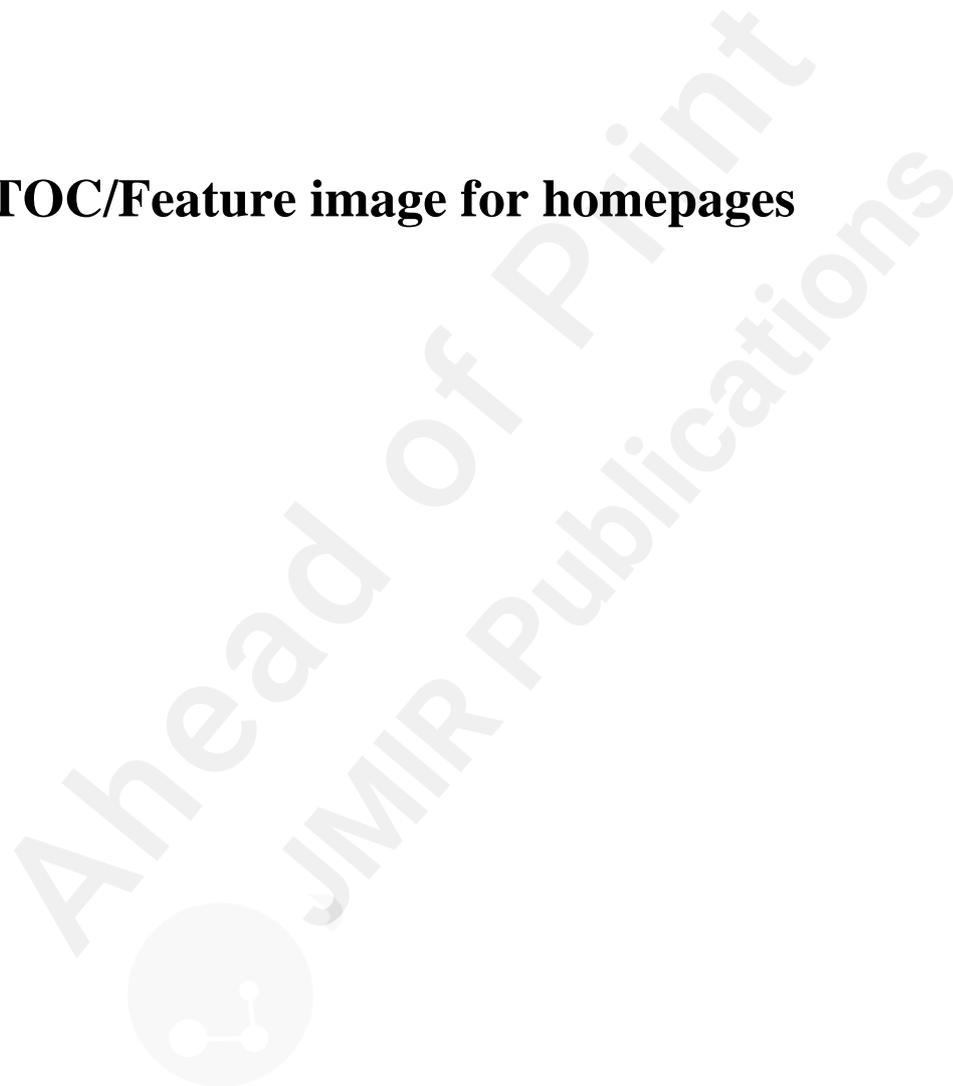
Codes, code description, and intercoder agreement per semantic domain.

URL: <https://asset.jmir.pub/assets/03c82e64eca5d8efd008a8518fc44de6.pdf>

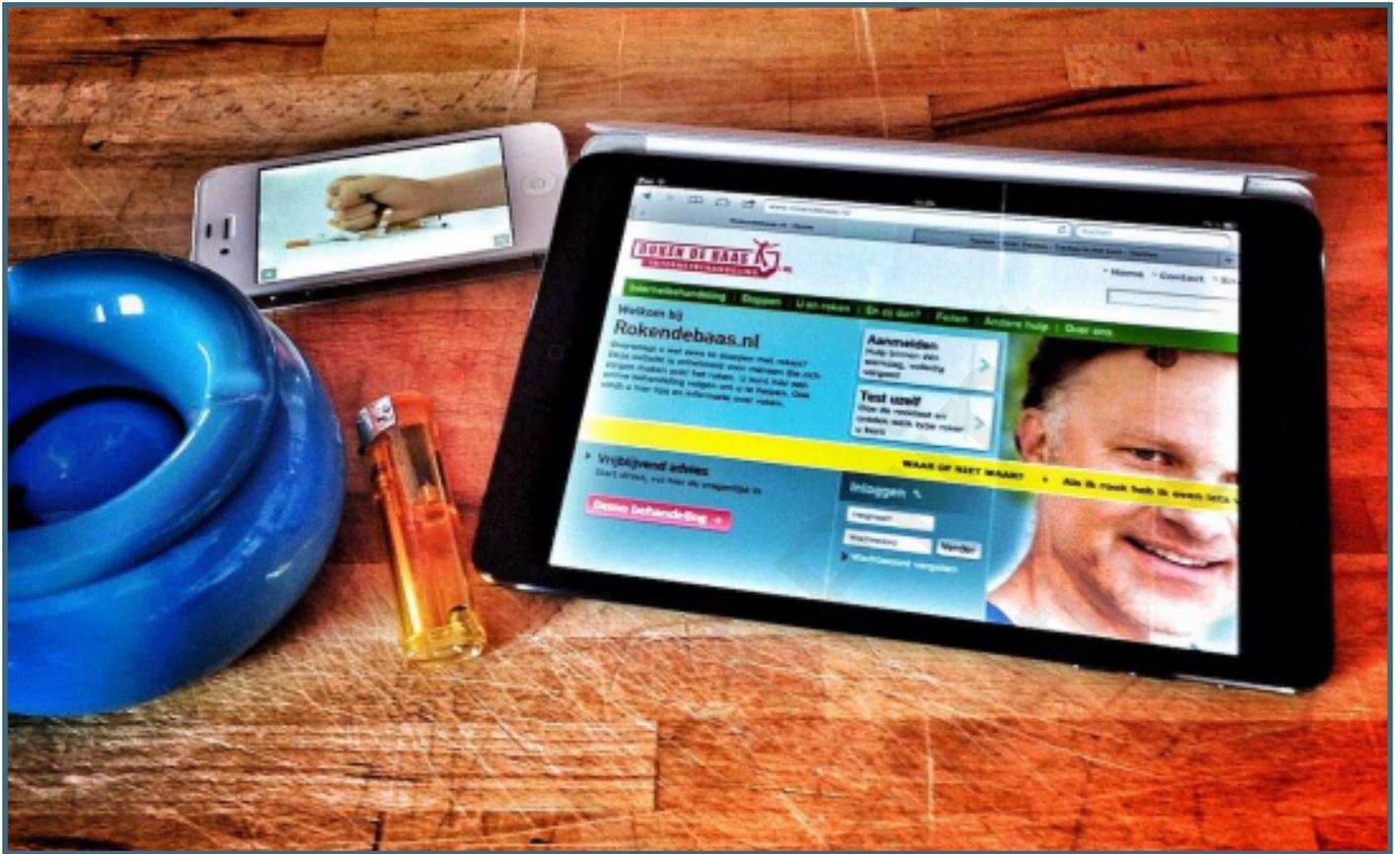
Selective sample & key elements.

URL: <https://asset.jmir.pub/assets/4b31b4e22e57fe34d052c18606cd4278.pdf>

TOC/Feature image for homepages

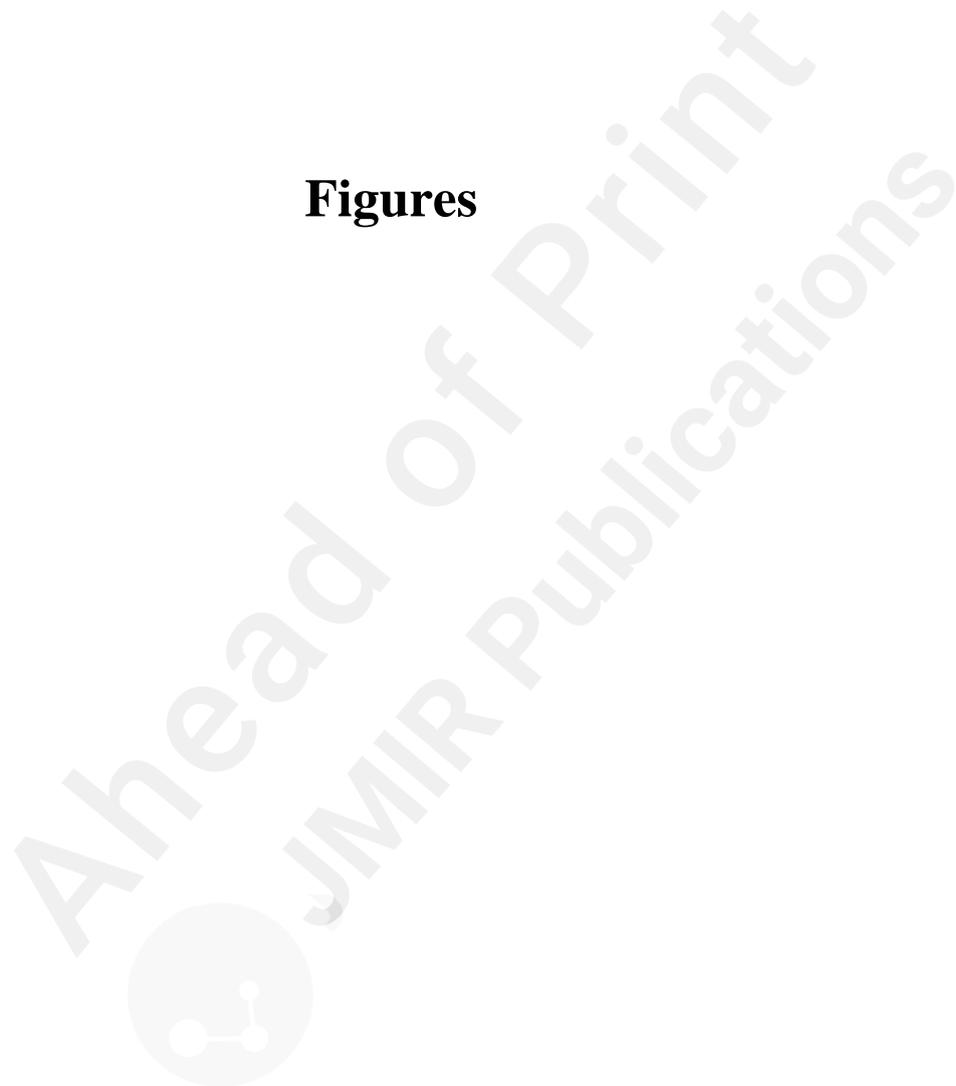


BSCT_UX.

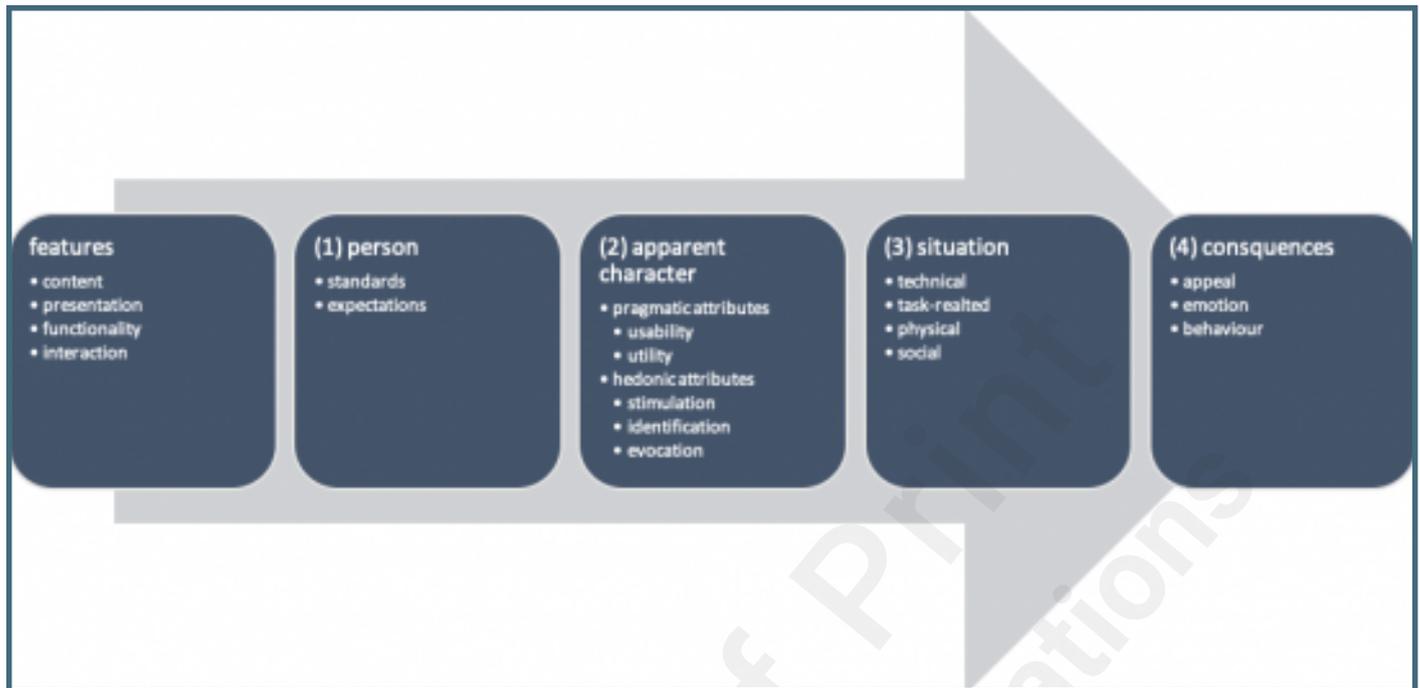


Ahead of JMIR Publications

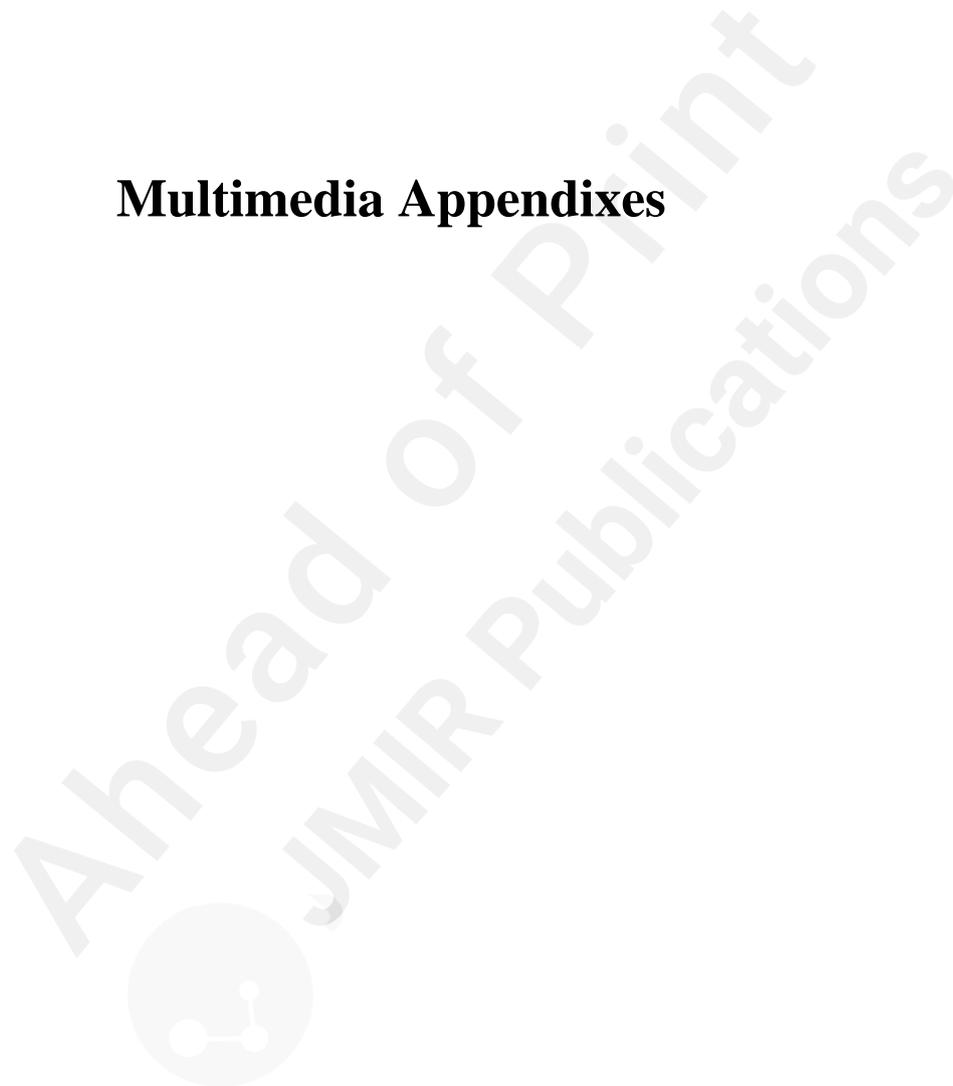
Figures



Key elements of the user experience model.



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Screenshots of the Web sessions of Blended Smoking Cessation Treatment.
URL: <https://asset.jmir.pub/assets/2e1d59e5586209a592839cad1d577288.pdf>



Other materials for editor/reviewers onlies

Revised version of the manuscript with tracked changes, as additional file.

URL: <https://asset.jmir.pub/assets/ebfe76aded483e2aef8ff3cfbe9e0f40.doc>

Responses to the reviewers, as additional file.

URL: <https://asset.jmir.pub/assets/ed720c78623be036d541c0610d6cf4ae.doc>

