Understanding the Relationship between Sexual Assault and Cervical Smear Uptake

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This thesis is dedicated to
Lottie and Emily

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1 Executive Summary

1.1 Psychological variables related to cervical smear uptake: A systematic review

A systematic review (SR) was conducted to critically analyse and combine studies identifying relationships between psychological variables and cervical smear (CS) uptake, in countries with organised screening programmes.

1.1.1 Background to the review

Cervical cancer (CC) is the fourth most common cancer in women worldwide. The most effective strategy for detecting, and therefore treating it, is through CS, which can detect potentially cancerous cells. Despite the effectiveness of CS, the current attendance rates are declining. Organised screening programmes encourage CS attendance by reducing some extrinsic barriers such as cost and a lack of health insurance. To continue to reduce mortality rates from CC, understanding intrinsic barriers that can be targeted through interventions is likely to be most beneficial. An SR was conducted on quantitative studies exploring the relationship between psychological variables, and intention to and actual attendance (uptake) of CS in countries with organised screening programmes.

1.1.2 Review question

Which psychological variables are related to CS uptake within countries with organised CS programmes?

1.1.3 Inclusion criteria

- Dependent variables: intention to or attendance of CS
- Independent variables: psychological variables

- Design: quantitative
- Empirical studies only
- Participants: women eligible for CS (25-65 years, unless retrospective or prospective designs with older or younger participants respectively)
- Country: with an established organised CS programme
- Publish date: after the CS programme started in country of recruitment

1.1.4 Search terms:

- Searches occurred on PubMed and PsychINFO
- Three search terms were entered:
    - All terms used globally to describe CS (e.g. pap test, cervical screen)
    - Terms related to 'psychological variable' (e.g. 'cognitive', 'associate')
    - Country of recruitment
- Filter of English language

1.1.5 Results

Thirty-eight studies were included in the review and their eligibility reviewed by two independent reviewers. Both reviewers methodologically appraised most studies, however no studies were removed on this basis. Most studies scored at least three out of six on the methodological appraisal tool, indicating an acceptable level of quality. Most criticisms related to potential recruitment bias, and the use of less reliable and valid outcome measures. Studies primarily drew on opportunity samples, using cross-sectional designs and self-report outcome measures. The results were collated using narrative synthesis and findings were categorised into groups based on their independent variables: behavioural, cognitive, affective, psychosocial and relational. Most studies looked at relationships between behavioural variables and attendance.

This identified positive significant relationships between health-promoting behaviours and attendance, indicating women who engaged in higher levels of health-promoting behaviours had higher CS attendance. This was not consistent with intention. An inconsistent relationship between risky health behaviours (e.g. alcohol use and sexual activity) and attendance was found as studies reported contradictory findings. Cognitive variables, including higher levels of knowledge and positive beliefs, related to higher CS uptake. Negative emotions such as fear, anxiety and embarrassment related to lower attendance levels, suggesting women who felt more apprehensive were less likely to go to their CS. Within psychosocial variables, migration was related to lower attendance levels and relational variables showed that women with a secure attachment had higher levels of CS attendance.

1.1.6 Implications

The inconsistent relationship within behavioural variables signifies the importance of focusing on psychological variables as a tangible focus for interventions to increase CS uptake. Cognitive and affective variables effectively aided understanding of CS uptake. People identified as immigrants had lower attendance rates, demonstrating the importance of understanding lower CS uptake within under-represented groups. The limited amount of studies exploring relationships with psychological variables and intention, and the role of affective variables, indicates the need for more research in this area. The clear search protocol allows for replication of this review. The current findings are limited by 'title only' searches, and inclusion of English studies only.

1.2 Understanding the relationship between sexual assault and cervical smear uptake

For the empirical paper (EP), a study was conducted to identify psychological factors related to CS uptake in women who have experienced sexual assault.

1.2.1 Background

Women who have experienced sexual assault have lower levels of CS uptake than the general population. One explanation is fears around CS triggering traumatic memories due to similarities between the two experiences, such as insertion of the vaginal speculum. At present, no theory-driven literature exists to facilitate understanding as to why women do or do not attend their CS following an experience of sexual assault.

The Health Action Process Approach (HAPA) is a health behaviour model which has previously been applied to inform interventions to increase CS uptake. The model includes three types of self-efficacy, which facilitates understanding of the relationship between intention and on going attendance to health-promoting behaviours. The current study aimed to explore whether the HAPA could explain CS uptake in women who have experienced sexual assault, over and above other potentially confounding variables, which relate to CS uptake. The study also aimed to explore whether trauma variables (severity of trauma symptoms, nature of trauma and age trauma occurred at) explain CS uptake better than HAPA variables.

1.2.2 Methods

Following service-user consultation and ethical approval, the study was conducted online using Qualtrics and advertised through social media sites of charities and support groups for women who have experienced sexual assault.

The study included the following questionnaires:

- Demographic questionnaire
- An idiosyncratic HAPA inventory including items related to:
    - Intention
    - Attendance
    - Intention variables:
        - Risk perception (the likelihood of developing CC)
        - Outcome expectancy (potential positive and negative consequences of attending CS)
        - Task self-efficacy (self-belief in ability to attend CS)
    - Attendance variables:
        - Maintenance self-efficacy (self-belief to persist with regular CS attendance despite challenges that may arise)
        - Recovery self-efficacy (self-belief to attend after a period of non-attendance)
        - Action planning (ability to plan exact details of next CS)
        - Coping planning (ability to plan how to cope with potential setbacks)
- Cervical Cancer Awareness Measure (CCAM)
- Sexual and Physical Abuse Questionnaire (SPAQ)
- Post-Traumatic Stress Checklist for Diagnostic Statistics Manual for Mental Disorders-V (PCL-5)

1.2.3 Results

Bivariate analyses, multiple regression, hierarchical regression and mediation analyses were conducted.

1) Demographic variables and CCAM did not relate to intention or attendance.
2) Hierarchical regression showed intention variables significantly explained intention after attendance variables were accounted for. Task self-efficacy partially mediated the relationship between outcome expectancy and intention.
3) Hierarchical regression showed attendance variables significantly explained attendance once intention variables were accounted for. Maintenance self-efficacy partially mediated the relationship between action planning and attendance.
4) Trauma variables did not independently significantly predict intention or attendance once HAPA variables were included. The relationships between PCL-5 score and intention and attendance, were fully mediated by task self-efficacy and maintenance self-efficacy respectively.
5) The relationship between intention and attendance was partially mediated by action and coping planning.

1.2.4 Discussion

The findings indicate that variables in the HAPA model can help explain intention and attendance of CS in women who have experienced sexual assault. Findings were generally consistent with previous research, however risk perception did not explain intention, and recovery self-efficacy did not explain attendance. These may be due to possible interactions of these variables with trauma variables. Interestingly, trauma variables did not offer a significant contribution to understanding CS. The

relationship between trauma symptoms on CS uptake was suggested to be due to the association of self-efficacy with both of these variables. Maintenance and task self-efficacy both predicted intention and attendance. This suggests that for women who have experienced sexual assault, the belief and confidence in their ability to continually attend their CS, even when faced with challenges, is the best predictor of CS uptake. This implies that helping women believe they can successfully attend on going CS, is likely to lead to increased CS uptake.

Overall, it can be concluded that CS uptake is related more to self-efficacy, than to the details of the sexual trauma (age and nature) and level of trauma symptoms. This offers a strong argument for the importance of self-efficacy for understanding CS uptake in women with a history of sexual assault, indicating that women can experience trauma symptoms and attend their CS, if they have high self-belief in their abilities.

Due to the cross-sectional, correlational design of the study causality cannot be confirmed. Future research using a longitudinal experimental approach would therefore help to further inform this area of research. Theoretically, this supports the application of HAPA to CS; therefore further work testing the applicability of the model within a general population, could inform health-behaviour literature. The high number of participants and the number of emails received by the researcher throughout the process indicates the desire of women in this population group to talk about their experiences, and the need for further research.

1.3 Integration, Impact and Dissemination

1.3.1 Integration

The findings of the SR and EP were in some ways consistent and in other ways incongruous:

- The SR found knowledge and risk perception related to CS uptake, however these variables were not significant in the EP.
- Both the SR and EP indicated the importance of positive beliefs to CS uptake, and a lack of a role of perceived barriers.
- Both identified the importance of cognitive and affective variables.
- The findings were aligned that different variables related to intention and attendance.
- Both highlighted the need for research into understanding health behaviours within under represented groups.

1.3.2 Impact

The study was done in conjunction with MyBodyBack – a charity who offer CS and maternity support to women who have experienced sexual assault. Currently, support is experientially guided, however the study hopes to provide evidence-based recommendations to support their work.

- The difference in findings when combining the EP and SR indicates the importance of offering specialised support to women who have experienced sexual assault. The lower attendance level within this group as compared to the national average supports this.

- The SR and EP identified that different factors are related to intention and attendance, so support should be offered to women dependent upon their level of intention and attendance.
- For women with low levels of intention, focus should be firstly on identifying why attending would be important and worthwhile for that individual. Secondly, increasing their self-confidence to attend through exposure to other women who have experienced sexual assault and attended.
- For women with intention but who are struggling to translate this into attendance, the focus should be around increasing their planning and self-efficacy. This would include helping to develop specific plans around their next CS attendance, and think about strategies they feel able to employ if it is difficult.
- For women who have attended previously but are now struggling, identifying previously coping strategies could be helpful. Furthermore, increasing their mastery skills through relaxation and mindfulness could be beneficial.

1.3.3 Theoretical Impact

The SR and EP add to our understanding of the intention-attendance gap, highlighting there is both an overlap and distinction between the variables that explain intention and attendance. Secondly, this supports the use of HAPA model within health-behaviour research.

1.3.4 Dissemination

The findings of the study will be summarised in a user-accessible summary sheet and disseminated to:

- The participants of the study who provided their email address requesting a summary of the findings
- The charities and support groups who advertised the study
- MyBodyBack charity who the study was conducted alongside

The study will be disseminated to journals, both for trauma and health behaviour. Feedback will be given to the British Psychological Society regarding recommendations for their internet-based research guidelines.

2 Psychological Factors Related to Cervical Smear Uptake: A Systematic Review

2.1 Abstract

Although cervical smears (CS) can effectively detect cervical cancer (CC), up to date attendance rates are falling nationally and throughout Europe. Organised screening programmes facilitate attendance to CS by reducing some of the extrinsic barriers such as cost or lack of insurance. Understanding intrinsic barriers to attendance is therefore important to target the falling attendance rates. This review was conducted on quantitative studies to look at relationships between psychological variables and intention to and attendance of CS, within countries with organised screening programmes. Thirty-eight articles identified from PsychInfo and PubMed were included in the review. Due to the heterogeneity of methodologies used, results were amalgamated using narrative synthesis and were methodologically appraised on six criteria.

Most studies used cross-sectional designs with opportunity samples to explore relationships between psychological variables, and intention and attendance. Engagement in more health-promoting behaviours related to higher attendance levels where as an inconclusive association was found with risky health behaviours. Cognitive variables, such as more knowledge of CC and CS, and a more positive attitude related to higher levels of intention and attendance. Limited research into affective variables, and variables related to intention was identified.

The review highlights the importance of considering the role of psychological variables when understanding barriers to intention and attendance of CS across population groups. Further research into the role of affective variables and factors related to intention is recommended.

2.2 Introduction

2.2.1 Cervical Screening Programmes

Cervical cancer (CC) is the fourth most common cancer in women worldwide (Cecilia, Rosliza, & Suriani, 2017). Over half a million women were diagnosed with CC in 2012, and 270,000 died as a result of the diagnosis (World Health Organisation, 2018). Cervical smears (CS) are the most effective way of preventing CC by identifying abnormal cells in the cervix, which could potentially become cancerous (NHS, 2015a; Peirson, Fitzpatrick-Lewis, Ciliska, & Warren, 2013). Access to CS for women has been facilitated through the implementation of cervical screening programmes. Although specific details differ (Williams, Carter, & Rychetnik, 2014), these programmes reduce the opportunistic elements of CS by being available to all eligible women, owing to the use of a population-based registry (Albrow, Kitchener, Gupta, & Desai, 2012). The inclusion of a call-re-call system enables on going attendance by calculating women's due date for their next CS using demographic data from GP registers (Public Health England, 2017a). The effectiveness of these programmes is highlighted by figures showing a substantial decline in incidence of and mortality from CC since their implementation (Peto, Gilham, Fletcher, & Matthews, 2004; Quinn, Babb, Jones, & Allen, 1999).

Despite non-attendance to CS being considered the main risk factor for a CC diagnosis, (Public Health England, 2017b), in the UK, only 72% of eligible women were up to date with their screening in March 2017 (NHS Digital, 2017). Worryingly, this demonstrates a 3% decrease in the national attendance rate over the previous five years (NHS Digital, 2017). These lower attendance rates are reflected more globally,

as only 53.2% of women in the EU are estimated to be up to date with their CS (European Commission, 2017). Increasing the understanding of factors related to non-attendance can inform interventions to target these declining rates, and improve women's health and wellbeing (Julinawati, Cawley, Domegan, Brenner, & Rowan, 2013). As organised screening programmes reduce many of the extrinsic barriers to attendance, such as cost (Julinawati et al., 2013) or lack of insurance (Ackerson & Greteback, 2007), focus on intrinsic variables, including psychological variables, may help to increase understanding of the falling attendance rates. The benefits of psychological variables, compared to sociodemographic factors, are their amenability through interventions (Armitage & Conner, 2000). Therefore, increased understanding of psychological variables related to health promoting behaviours, such as CS, can inform interventions targeting low attendance.

To effectively improve attendance rates, understanding the specific variables related to intention to attend and actual attendance of CS separately is necessary. The formation of an intention is a significant predictor of completing the behaviour, as described in the Theory of Reasoned Action (Fishbein & Azjen, 1975) and Theory of Planned Behaviour (Ajzen, 1985). However, Orbell and Sheeran (1998) found that within CS, the majority of women (57%) who expressed intention to attend their CS, did not translate this into actual attendance. As such, exploration of factors related to both intention and attendance separately is important to ensure a full understanding of non-attendance. 'Uptake' will be used when describing both intention to and attendance of CS.

2.2.2 Psychological variables related to CS uptake

The role of psychological variables in explaining health behaviours has been emphasised in models such as the Health Belief Model (Rosenstock, Stretcher, & Becker, 1988) and the Theory of Planned Behaviour (Ajzen, 1985). The application of these to CS has generated a breadth of data across populations, encouraging the use of systematic reviews to summarise the findings. However, many existing reviews are limited in their capacity to increase understanding of psychological factors, due to employing restrictive inclusion criteria. This includes limiting criteria to variables related to a certain model, such as the Health Belief Model (Austin, Ahmad, McNally, & Stewart, 2002), Theory of Reasoned Action (Cooke & French, 2008) or the Decision Theory Perspective (Ackerson & Preston, 2009); or to a specific population (Lu, et al., 2012). Although beneficial in developing knowledge in these areas, this reduces the generalisabilty of this knowledge, therefore highlighting the need for more research in this area.

2.2.3 Previous literature

Bukowska-Durawa and Luszcznyska's (2014) review adopted a less restricted approach and found perceived psychosocial barriers, such as beliefs, knowledge and affective variables, were related to lower CS attendance. The review emphasised the importance of acknowledging these variables across population groups to improve CS uptake. However, the authors included a large number of studies based in the United States of America, where organised CS programmes do not exist (Habbema, de Kok, & Brown, 2012), therefore the focus was on practical factors such as cost. Barriers such as these are less amenable to interventions due to their idiosyncratic nature.

Furthermore, the authors did not distinguish between intention and attendance, which as previously noted, is likely to be particularly beneficial in understanding CS uptake.

A recently published review in this area by Chorley, Marlow, Forster, Haddrell and Waller (2017) explored barriers to CS in the context of countries with organised screening programmes. Their review focused on qualitative studies, and did not restrict the search to a theory or model, which enabled variables outside of previously identified theories to be included. Although this broadened the literature related to barriers to CS, it simultaneously limited the results by excluding potentially relevant quantitative studies. This may have restricted the reliability of the results, as synthesis of qualitative data can be open to bias (Bearman & Dawes, 2013). Furthermore, the identified decline in CS attendance since 2015, when studies were identified for this review, indicates a need for a more up to date review to facilitate understanding of barriers to on going attendance.

2.2.4 Rationale for the current review

The current review therefore aims to address the gap in literature by identifying quantitative studies looking at psychological variables related to CS uptake. The amalgamation of quantitative data will enable synthesis of a large number of participant variables to be analysed, with the view to produce generalisable results and fill an important gap in current research. This will develop previous research by not applying a specific theoretical model or orientation. The focus on psychological variables is with the aim of identifying potential targets for interventions to help increase CS uptake. The main objective is to critically analyse and combine data from

quantitative studies conducted in countries worldwide with organised CS programmes, to allow for focus on psychological variables. The review therefore hopes to explore: Which psychological variables are related to CS uptake within countries with organised CS programmes?

2.3 Methods

A review protocol (Appendix 1) was developed specifying the inclusion criteria. The systematic review was guided by PRISMA (Moher, Liberati, Tetzlaff, & Altman, 2009) and aspects of the methodology, such as search terms and items in the inclusion criteria were guided by previous reviews of barriers to CS uptake (e.g. Chorley et al. 2017).

2.3.1 Search Strategy

Articles were identified by conducting systematic online searches of PsychINFO and PubMed. These databases were selected based on their relevance to the review subject. Searches were conducted by the author KM on 13th October 2017 and repeated on 9th February 2018 to ensure all up to date papers were included.

2.3.2 Inclusion criteria

The following inclusion criteria was applied to all studies:

1) Includes intention to attend or actual attendance of CS as an outcome variable;
2) Measures psychological variables as independent variables;
3) Uses a quantitative design;
4) Is of an empirical nature;
5) Includes women eligible for CS;
6) Recruitment occurred in a country with an organised CS programme;
7) Article was published after the start of the CS programme in that country.

2.3.3 Study Eligibility Criteria

Three primary search terms were used to implement the inclusion criteria. The reliability of the inclusion criteria was checked by ensuring key articles related to this topic were successfully identified through the systematic searches. The search strategy adhered closely to PRESS guidelines to achieve a good quality evidence base (McGowan et al., 2016). Free text words were used, with Boolean search operators and parentheses for breadth and efficiency, and truncation asterisks to capture related terms. A limit of English language was applied.

The two dependent variables were intention to attend and actual attendance of CS. To ensure sensitivity, terms used globally for CS were included. These were identified from previous research (e.g. Chorley et al., 2017). The search terms were looked for in the title only to ensure papers were specifically related to CS.

Independent variables were "psychological variables" including cognitive, affective, behavioural, relational or psychosocial variables. This excluded demographic factors, practical variables such as cost, and experiential variables such as gender of the person conducting the test. The search terms were consistent with previous reviews and occurred within the title to ensure specificity.

The third inclusion criterion of Country of recruitment was searched for in the whole article. Countries with an organised CS programme were included in the

study; this was defined as countries with a call re-call programme. Countries with opportunistic programmes, where CS uptake is dependent upon requests from the

individual or a health advisor (Cho, 2016) were excluded. To increase the generalisability of the review the list of eligible countries was extended from Chorley et al. (2017) by removing their criteria that programmes were established for more than 10 years. The additional countries included in this review were identified from OECD (2017) and Gakidou, Nordhagen and Obermeyer (2008). It was deemed appropriate to include Canada and Italy as the majority of women in these countries have access to organised screening programmes. This inclusion criterion enabled the results to be compared to those of the empirical paper.

Participants were women eligible for CS, based on their age and having not had a total hysterectomy. The age limits used were based on the UK age restrictions of when women are invited to attend a CS, which is women aged 25-65 years old. Exceptions to this criterion were retrospective studies including women outside of the upper age limit or prospective studies involving young adults below the lower age limit.

The final inclusion criterion relating to the date of publication, was applied by comparing the year of publication to the year the screening programme begun in that country (see Appendix 2).

The search terms were:

1) In title: “Pap screen” OR “Pap screening” OR “Papanicolaou test” OR “Papanicolaou screen” OR “Papanicolaou smear” OR “Pap smear” OR “Pap test” OR “Cervical screen” OR “Cervical smear” OR “Smear test” OR “Cervical screening” OR “Cervical cancer screening” OR “Cervical cancer screen” OR

"Vaginal smear" OR "Liquid base cytology" OR "HPV test"

AND

2) In title: Barrier* OR Facilitat* OR Associat* OR Relat* OR Psycholog* OR Psychosocial OR Psychiatric* OR Behaviour* OR Emotion* OR Affective OR Mood OR Beliefs OR Cognitive

AND

3) In all Fields: Australia OR Canada OR Denmark OR Finland OR Iceland OR Italy OR "Republic of Korea" OR Korea OR Netherlands OR Norway OR Slovenia OR Sweden OR Great Britain OR Channel Islands OR England OR Northern Ireland OR Scotland OR Wales OR Poland OR Hungary OR Latvia OR Slovenia

2.3.4 Study Selection

Duplicate studies were removed and articles were recorded in a spreadsheet. Initial screening for eligibility was conducted by the author and an undergraduate psychology student independently and non-blinded, using study titles and abstracts.

Ratings of titles and abstracts were compiled in the spreadsheet, with 'yes/no/maybe' criteria. To ensure over-inclusion at this stage, the full articles were accessed if either reviewer rated the paper with a 'yes' or 'maybe'. All non-empirical papers were excluded at this stage, where empirical research was defined as research based on collected data rather than a theory. As such, all systematic reviews were excluded.

2.3.5 Data extraction

Data extraction occurred by the author. A data extraction sheet was developed and piloted on a random selection of studies and refined as necessary.

The following information was extracted from the final papers:

1) Design features including the design of the study and sampling method;
2) Participant information including the number of participants recruited, inclusion/exclusion criteria and general demographic information of the sample;
3) Information about the independent variables and outcomes variables, including the measures for each of these;
4) Statistical findings were extracted including the effect size. If all analyses were significant, only multivariate analyses were reported for conciseness.

2.3.6 Quality assessment

The author and undergraduate psychology student evaluated the quality of included studies independently, using a quality assessment tool derived from recommendations from the Quality Assessment Tool for Quantitative Studies (Jack, et al., 2010) and by Effective Public Health Practice Project (1998). Disagreements were resolved through discussion with a third reviewer, the author's academic supervisor. No studies were removed based on quality assessment, as this can lead to over-exclusion, therefore potentially limit the validity of the results (Meline, 2006).

2.3.7 Data synthesis

Data was not statistically synthesised as a variety of methods were used to measure the outcome variables, meaning a meta-synthesis or meta-analysis was not possible

(Popay, et al., 2006). Due to the heterogeneity of methodologies used, narrative synthesis was used to summarise the findings, using the guidelines as set out by Popay et al., (2006). To aid narrative synthesis of the results, psychological variables were categorised into groups, influenced by domains described by Barker, Pistrang and Elliott (2002). The following groups were applied: 'behavioural' was used to describe observable actions; 'cognitive' described any constructs related to thoughts, attitudes and beliefs; 'affective' variables was used to describe both state and trait emotions; 'psychosocial' was used to define constructs related to life-experiences and self-concepts (Hall, Andrzejewski, & Yopchick, 2009); and 'relational' variables referred to interpersonal constructs.

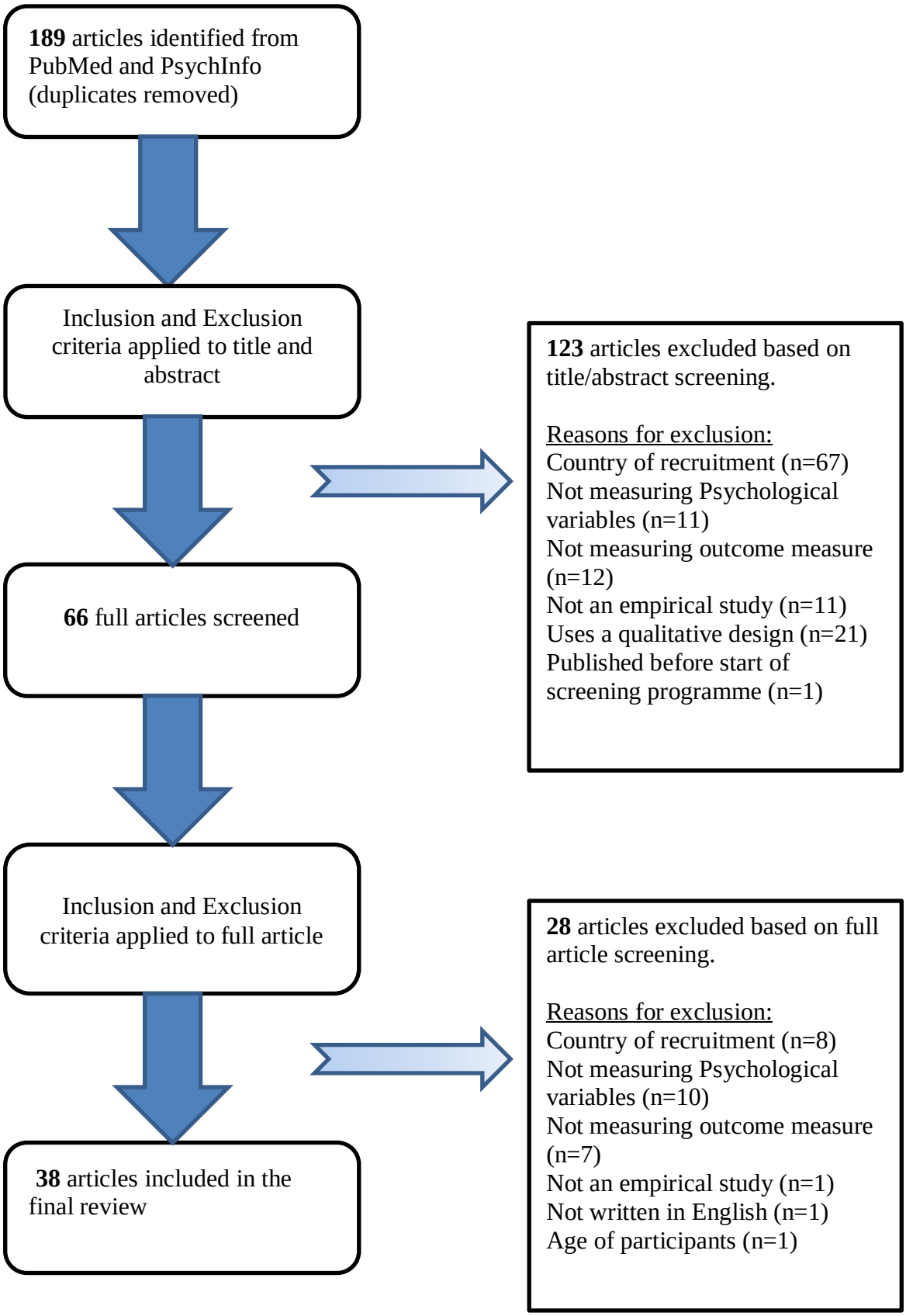

Figure 1: Systematic Review Flowchart

2.4 Results

One hundred and eighty nine articles were identified, following the removal of duplicates. The titles and abstracts were screened according to the inclusion criteria. Full article screening was conducted for 66 articles, the majority of which (90%) were blind reviewed by two reviewers, the author and undergraduate psychology student. This yielded a substantial level of agreement (kappa=0.78). Reasons for exclusion were commented on and are described in the Figure 1. Disagreements were discussed and resolved by a third reviewer (the author's academic supervisor) who was blinded to the judgment of the first two reviewers. A total of 38 papers were included in the final review, as described in Table 1. These were published between 1992-2018 and conducted in Canada (n=10), Great Britain (n=8), Australia (n=6), Nordic countries (n=5), Netherlands (n=4), Korea (n=4) and Poland (n=1).

2.4.1 Sample

The total number of participants included across the studies was 1,531,743 and sample sizes ranged from 52 to 1,365,849. The age of participants ranged from 16-79 years old. Inclusion criteria comprised of: age range (n=20); location of recruitment (n=4); ethnicity (n=3); and a student population (n=3). Eight studies included CS eligibility as part of their criteria, defined as: not having had a hysterectomy (n=4) or a recent CS (n=2), or being due a CS (n=2). Other studies focused on more specific participant groups such as women with a learning disability (n=1), with a history of sexual assault (n=1), smokers (n=1), sex workers (n=1) or with a specified sexual history (n=1).

2.4.2 Methods

Most of the studies were a cross-sectional design (n=25), retrospective study (n=8) or cohort study (n=4). One study used an experimental between-subjects design, looking at the effect of an information leaflet using a control group. The sampling approaches used were opportunity (n=18), stratified (n=11), random (n=5), strategic (n=3) or selective (n=1).

The majority of studies looked at previous attendance to CS (n=32), with only four looking at intention and two looking at both intention and attendance. Most studies used one method of collecting data for the outcome measure (n=18). Self-report measures were employed in the majority of studies, (n=25), three used GP records or databases and four used a combination of the two. The definition of "attendance" used for the outcome measure varied considerably, including: ever had a CS (n=7), attended a CS within the past five years (n=1), past three years (n=6), past two years (n=8), past year (n=4) or within three months of the study (n=1). One study did not specify their criteria and one other related attendance to the Stages of Change model (Prochaska, & DiClemente, 1986).

For intention, all studies used self-report measures. Of these, four used Likert scales (e.g. "*How much do you intend to attend your next smear from 1-7?")* and three used dichotomous answers (e.g. *"Do you intent to attend your next smear? Yes/No").*

Table 1: Data extraction results

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Bish, Sutton and Golombok (2000) *England*	Cohort study; strategic sampling	142 women due for CS within 6 weeks; *M*=38	*Intention:* 2 items (intention and likelihood); *Attendance:* 2 items ("ever" and medical record)	*Cognitive:* Theory of planned behaviour (5 item) and health belief model (9 items) variables (attitude, subjective norm, self-efficacy, perceived behavioural control, perceived costs, benefits and severity)	*Intention:* Attitude towards CS explained a significant proportion of variance of intention (F=34.02, R^2=0.53, adjusted R^2=0.51)** Perceived risk significantly contributed to variance of intention (β=0.25)* *Attendance:* Attitude towards CS significantly positive correlated with behaviour (r=0.22)
Broughton and Thomson (2000) *England*	Cross-sectional survey; opportunity sample	52 women with a learning disability (not severe; no difficulties with comprehension or communication), living in group, family or own home, aged 20-60	*Attendance:* 2 items, questionnaire, medical record	*Behaviours:* Smoking, being sexually active	*Attendance:* Women with a history of sexual activity (χ^2=14.1; d.f.=2)*** or who smoked (χ^2=10.1, d.f.=2)** were more likely to have had a CS
Cadman, Waller, Ashdown-Barr and Szarewski (2012) *UK (online)*	Cross-sectional survey; opportunity sample	135 women visiting NAPAC website aged over 20 years with experience of sexual abuse; *M*=34.5	*Attendance:* 2 items (past behaviour, time since CS)	*Affective:* Fear/anxiety	*Attendance:* Attenders reported significantly lower levels of reported fear/anxiety (p =.009)

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Cerigo, Coutlee, Franco and Brassard (2013) *Canada*	Cohort study; opportunity sample	402 women aged 21-69 years, *M*=34.2	*Attendance:* 2 items (past 1 year; overall attendance - medical file review)	Behaviour: History of childbirth	*Attendance:* History of childbirth more likely to regularly attend (OR =2.57, 95%CI 1.10-6.0)
Chang et al. (2017) *Republic of Korea*	Cross-sectional survey; stratified multistage probability design	373 women with no history of CC; 15-39 years	*Attendance:* 1 item (time, 3 options)	*Behaviour:* Alcohol consumption, current smoking status	*Attendance:* Being a current smoker (OR=1.097, 95%CI 0.844-1.4267)* or ex-smoker (OR=2.22, 95%CI 1.680-2.992)* and alcohol consumption (OR=1.324, 95%CI 1.140-1.537)* were associated with CS attendance
Chang, Woo, Gorzalka, and Brotto, (2010) *Canada*	Cross-sectional survey; opportunity sample	171 mother-daughter pairs, Chinese and Caucasian *M*= 52.26/49.78 (mothers) and 23.94/22.46 (daughters)	*Attendance:* 2 items, dichotomous (within last 2 years, frequency)	*Cognitive:* Beliefs about CS (HBQ); heritage acculturation (VIA)	*Attendance:* Accurate beliefs about CS (χ^2=9.28, d.f.=3)*, women who engaged in sexual intercourse and had lower heritage acculturation (χ^2=48.12, d.f.=4)* more likely to have had CS
Choi, Heo, Kim, Jeon, and Oh (2013) *Korea*	Cross-sectional survey; strategic design	"Around 900" women	*Attendance:* 1 item (time – last 2 years)	*Behavioural:* Obesity, quality of life, smoking, alcohol consumption, physical activity	*Attendance:* Negatively associated with obesity rate (β=-1.93, 95%CI -3.43 to -0.43); higher quality of life associated with higher screening rate (β=2.51, 95%CI 0.68-4.34); smoking and drinking alcohol = ns

Authors and country	Design and Sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Cockburn, White, Hirst and Hill (1992) *Australia*	Cross sectional survey; random opportunistic sample	347 40-70 years old; no history of hysterectomy	*Attendance:* 1 item (time - last 2 years)	*Cognitive:* Knowledge e.g. needing a test even when healthy (11 item); perceived barriers (4 items)	*Attendance:* Embarrassment (OR=6.90; 95%CI 3.12-15.22) and poorer knowledge about CS (OR=6.14, 95%CI 2.37-15.90) significantly increased likelihood of being overdue CS; fear of finding something wrong endorsed significantly more in women who were overdue (p<.001)
Duff, et al. (2016) *Canada*	Cohort study; opportunity sample	611 women due a CS within 12 months, sex workers, cisgender and transgender, older than 14 years old (M=34)	*Attendance:* 1 item (time, last year) dichotomous	*Behaviour:* Drug use, intimate partner violence, homelessness, immigration	*Attendance:* Accessing outreach services offering CS (AOR = 1.35; 95%CI = 1.09, 1.66) Having experienced a barrier to health care services in the past reduced women's odds of regular testing (AOR=0.81; 95% CI = 0.65-1.00)
Eiser and Cole (2002) *England*	Cross-sectional survey; opportunity sample	70 students, aged 20-25 (M=21.6)	*Attendance:* 2 items, dichotomous	*Cognitive:* Risk factor awareness, personal risk, cognitive closure, perceived barriers to testing	*Attendance:* On going CS attendance was related to greater need for cognitive closure (F(1,64)=7.18)** and fewer perceived barriers (F(1,63)=22.72)**
Falasinnu (2011) *Canada*	Cross-sectional survey; multi-stage sampling	2,873 current smokers, living in Ontario, aged 18-69	*Attendance:* 1 item, dichotomous; *Intention:* 1 item, dichotomous	*Behaviour:* Smoking	*Attendance:* Women contemplating (OR=1.4 95%Ci 1.19-1.65) and preparing (OR=1.82, CI 95% 1.47-2.25) to quit smoking had higher odds of having a recent CS compared to pre-contemplators; daily cigarette consumption negatively associated with having a recent CS (AOR=0.98, 95%CI 0.97-0.99)

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Girgis, Bonevski, Perkins, and Sanson-Fisher (1999) *Australia*	Cross-sectional survey; stratified sampling	230 women in NSW aged 18-70	*Attendance:* 1 item, (time – 4 options)	*Cognitive:* Perceived barriers (including knowledge), perceived facilitators	*Attendance:* ns
Goel (1994) *Canada*	Cross-sectional survey; multi-stage stratified cluster design	16,969 women aged 16-65	*Attendance:* 1 item, 4 time options	*Behaviour:* Smoking, alcohol, sexual activity; *Cognitive:* Plans to improve health and self-perceived well-being	*Attendance:* Having had a sexual partner (AOR=17.64, 95%CI 12.89-24.13); smoked (AOR=1.51, 95%CI 1.22-1.87); being a current drinker (AOR=2.09; 95%CI 1.63-2.70); having had more than six contacts with a health professional (AOR=4.22, 95%CI 2.59-6.89); and having had a child (AOR=2.8-, 95%CI 2.17-3.61) predicted ever having had a CS Cognitive = ns
Hansen et al., (2011) *Denmark, Iceland, Sweden, Norway*	Cross-sectional survey; random sampling	12,058 women aged 18-45	*Attendance:* database	*Behaviour:* Risk behaviours (alcohol, smoking, sexual behaviours) and health promoting behaviours; *Cognitive:* Knowledge	*Attendance:* Nonattendance significantly higher in current smokers (OR=1.41, 95%CI 1.20-1.66)***; lower knowledge (OR=1.39, 95%CI 1.12-1.72)**; no condom use (OR=1.38, 95%CI 1.15-1.65)***; poor health self-rating (OR=1.26, 95%CI 0.97-1.63)***; never drink wine (OR=1.34, 95%CI 1.06-1.68)**; never used hormonal contraceptives (OR=2.21, 95%CI 1.75-2.58). Attendance higher in women who had given birth (OR=0.62, 95%CI 0.48-0.82)***

Authors and country	Study design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Hestbech, Gyrd-Hansen, Kragstrup, Siersma, and Brodersen, (2016) *Denmark*	Cohort survey; random sampling	949 Danish women born 1993-1995 (24-26 years)	*Intention:* 1 item, dichotomous	*Health behaviour:* HPV vaccination	*Intention:* HPV vaccination related to intention (OR=3.89, 95%CI 2.50-6.06)*** Risk perceptions=ns
Hill and Gick (2011) *Canada*	Retrospective study; opportunity sample	257 female undergraduate students aged 17-45	*Attendance:* 1 item, dichotomous	*Cognitive:* Perceived barriers (14 items, 7 point Likert scale)	*Attendance:* Significant association between sexual intercourse experience and previous behaviour (χ^2 (1)=89.77)***
Hill and Gick (2013) *Canada*	Cross-sectional survey; opportunity sampling	257 Canadian undergraduate students, aged 17-45	*Attendance:* 1 item (ever), dichotomous	*Relational:* Attachment (2 questionnaires), *Cognitive:* perceived barriers (11 items, 7 point Likert scale); *Behaviours:* Lifestyle and Behaviours Questionnaire; *Personality:* Neuroticism Big Five subscale (5 point Likert scale)	*Attendance:* Secure attachment style increased CS attendance likelihood compared to dismissing attachment (χ^2 (1)=6.24)*. Increases in attachment anxiety (OR=.67, 95%CI .46-.97) or attachment avoidance (OR=.65, 95%CI .43-.97) significantly decreased odds of having received a CS

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Hislop et al. (2003) *Canada*	Cross-sectional survey; random stratified sampling	512 Chinese Canadian women aged 20-79	*Attendance:* 2 items, past and recent	*Cognitive:* Traditional health beliefs; beliefs about testing, perceived risks	*Attendance (ever having had a CS):* Beliefs that CS can prevent CC (OR=2.3, 95%CI 1.2-4.3)* and is necessary for asymptomatic women (OR=2.8, 95%CI 1.4-5.7)** associated with ever having had a CS *Attendance (having had a recent CS):* Belief that CS is necessary for postmenopausal women (OR=2.5, 95%CI 1.3-.9)** associated with recent CS. Concern about pain significantly associated with no recent CS (OR=0.3, 95%CI 0.1-0.8, *p*=.01)*
Idehen, et al. (2017) *Finland*	Cross sectional survey; random stratified	620 women of Russian, Somali or Kurdish origin, living in Finland for a year, native language, living in one of six cities; aged 25-60	*Attendance:* 1 item, dichotomous	*Health Behaviour:* previous gynaecological examination	*Attendance:* Having had a gynaecological check up in the past 5 years significantly increased CS participation likelihood in Russian (OR=9.49, 95%CI 4.52-20.7)***, Somali (OR=6.54-26.2, p<.001) and Kurdish (OR=26.2, 95%CI 11.4-60.1)*** women. Childbirth related to attendance in Kurdish women (OR=9.34,95%CI 1.58-55.1)**
Kaida, Colman, and Janssen (2008) *Canada*	Cross-sectional survey; random stratified	25,351 women aged 16-69; no hysterectomy	*Attendance:* 2 items, dichotomous	*Affective:* Depression (CIDI-SF, 8 point scale)	*Attendance:* Depressed women ns (only significant with age as a moderator)

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Khadilkar and Chen (2013) *Canada*	Cross-sectional survey; multi-stage stratified cluster design	16706 women aged 20-69 living in private dwellings	*Attendance:* 1 item, dichotomous	*Behaviour:* Immigration (recent <10 years; non-recent; no)	*Attendance:* Significantly lower attendance in recent immigrants (PR=0.77, 95%CI 0.71-0.84)*
Knops-Dullens, de Vries and de Vries (2007) *Netherlands*	Cross sectional design; random opportunistic sampling	165 women, no recent CS or hysterectomy; *M*=44.4 years	*Attendance:* Multiple questions about experience – attenders and non-attenders	*Behaviours:* Risky behaviours; *Cognitive:* Risk perception (2 items, 3 point scale), knowledge (27 items, 3 point scale), perceived benefits (7 questions, 5-point scales), social influence (4 items, 4 point scale), self-efficacy (11 items, 8 point scale)	*Attendance:* Factors associated with attenders: use of oral contraceptives (OR=4.09, 95%CI 1.15-14.57)*; risk perception related to other women (OR=1.77, 95%CI 1.19-1.27)**; subjective norm (OR=1.16, 95%CI 1.02-1.32)*; barrier self-efficacy (OR=1.19, 95%CI 1.06-1.34)**; more anticipated regret (*t*=-4.18)***; higher social support levels (*t*=-2.33)*; higher self-efficacy (*t*=-3.61)***; and higher intention (*t*=-3.32)** Factors related to non-attenders: ambivalence (OR=0.18, 95%CI 0.04-0.75)*, more cognitive cons (*t*=-3.85)***; and affective cons (*t*=-3.18)**
Korfage et al. (2018) *Netherlands*	Random between subjects; Opportunity sample	226 women aged 30-60	*Intention:* 1 item (Likert scale 1-7)	*Cognitive:* Gist knowledge (7 items), explicit attitudes (6 items)	*Intention:* Positive explicit attitude (*r*=0.79)***, previous participation (*r*=0.53)*** and gist knowledge, (*r*=0.16)* positively correlated with intention

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Kreuger, Van Oers and Nijs (1999) *Netherlands*	Cross-sectional; selective sampling	70,621 women invited to screening 1992-1994 living in Rotterdam in a neighborhood with 2000 or more residents	*Attendance:* 1 item (from laboratory)	*Behaviour:* Immigration	*Attendance:* Negative correlation between percentage of migrants and attendance ($r(51)$=-0.51***
Leinonen, Campbell, Ursin, Trope, and Nygard (2017) *Norway*	Retrospective cohort study; stratified	1,365,849 women aged 26-69 residing in Norway on a certain date	*Attendance:* adherence in past 4 years (national database)	*Behaviour:* Immigration	*Attendance:* Non-adherence 1.72 times higher in immigrant women compared to native (95% CI 1.71-1.73)
Lo, Waller, Wardle and von Wagner (2013) *Great Britain*	Retrospective survey; random location sampling	890 women aged 50-80 eligible for screening; *M*=61	*Attendance:* 1 item, dichotomous	*Cognitive:* Perceived barriers (10 items, dichotomous)	*Attendance:* Risk perception (16.2%, 95%CI 10.8-24.3%)**, avoidance (4.5%, 95%CI 1.8-9.9%)* and negative attitude (4.5%, 95% CI 1.8-9.9%)* significantly positive correlated with no previous attendance
Lovell, Wetherell, and Shepherd (2015) *England*	Cross-sectional survey; opportunity sample	430 women aged 25-35 years	*Attendance:* 1 item Dichotomous response.	*Cognitive:* Informational and attitudinal factors; *Behaviour:* Risky health behaviours (smoking, sexual partners, 1st sexual experience age)	*Attendance:* More sexual partners, intention, and attitudes explained 56% of the variance in predicting non-attendance ($\chi^2(18)=181.12$)***

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Luszczynska, Durawa, Scholz, and Knoll (2012) *Poland*	Cross-sectional survey; opportunity sample	Women aged 18-65, no hysterectomy; Study 1: 386 (*M*=35.15); Study 2: 424 (*M*=35.86 years); Study 3: 527 (*M*=28.76 years);	*Intention:* 1 item on 5 point Likert scale; *Attendance:* one item on 5 point Likert scale	*Cognitive:* Empowerment (PPS-R scale); self-efficacy (4 items, 4 point Likert scale) ; knowledge (4 items, dichotomous); social-related pros (e.g. benefits for other)	*Attendance:* Significantly related to self-efficacy (*r*=.19)***, social-related pros (*r*=.16)***, social support (*r*=.27)*** and communication barriers (*r*=.35)*** *Intention:* Significantly related to social-related pros (*r*=.25)***, social support (*r*=.37)***, communication barriers (*r*=.35)*** and empowerment, mediated by self-efficacy (Sobel *Z*=1.97)*, wellbeing related pros (Sobel *Z*=2.50)*, discomfort related barriers (Sobel *Z* =1.99)**, appearance and weight satisfaction (Sobel *Z*=2.57)*, social support (Sobel *Z*=3.02)** communication skills (Sobel *Z*=2.09)* and social-related pros (Sobel *Z*=2.31)*
Mather, McCaffery, and Juraskova (2012) *Australia*	Cross-sectional survey; opportunity sample	193 women aged 18-29 years; *M*=19.2	*Intention: 6* items on 5 point Likert sale ; *Uptake:* no description	*Health behaviour:* HPV vaccination	*Intention:* HPV vaccination ns
Östensson et al. (2015) *Sweden*	Retrospective survey; opportunity	1510 aged 23-60; no recent CS	*Attendance: 1* item, attendance within 1 year of invitation, dichotomous	*Cognitive:* Knowledge of HPV (17 items), dichotomous); reasons for non-compliance	*Attendance:* Knowledge ns

Authors and country	Design and Sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Park, Yoo and Chang (2002) *Korea*	Cross-sectional survey; opportunity sample	515 women, no previous CS or CC, aged 24-69	*Intention:* 1 item, dichotomous	*Affective:* Affective response before, during, after (15 items on 5 point Likert scale)	*Intention:* Women with intention had higher apprehension after testing (t=2.695)* and higher positive affect after results (t=3.014)** than those without intention
Park and Park (2010) *Korea*	Retrospective survey; probability sampling	2590 women aged 21+, no history of hysterectomy, eligible for CS	*Attendance*: 1 item dichotomous	*Behaviour:* Smoking (1 item, dichotomous)	*Attendance:* Smoking was significantly negatively related (OR=0.447, 95%CI, 0.280-0.715)***
Perkins, Sanson-Fisher, Byles and Tiller (1999) *Australia*	Retrospective study; Stratified sampling by age and location	Unknown number of women who received a CS 1990-1992 aged 18-69	*Attendance:* 1 item (database, standardised ratio)	*Behaviour:* Immigration	*Attendance:* Immigration negatively associated (R^2=0.1323, b=-452.63)*
Savage and Clarke (2001) *Australia*	Retrospective survey; strategic probability sampling	1200 women aged 50-70	*Attendance:* 1 item dichotomous	*Cognitive:* Perceived barriers (1 item dichotomous), perceived benefits (1 item, 5 point Likert), emotion belief (1 item 5 point Likert scale); *Affective:* Frightened response (1 item 5 point Likert)	*Attendance:* Perceived benefits (OR=1.44, 95%CI 1.16-1.80)***, emotion belief (OR=1.22, 95%CI 1.05-1.42)*, frightened belief (OR=1.16, 95%CI 1.02-1.31)* and mammography behaviour (r=0.32)*** were significantly related to increased likelihood of attendance Perceived barriers (OR=0.23, 95%CI 0.15-0.36)*** and illness representation (OR=0.75, 95%CI=0.57-0.99)* were significantly related to reduced likelihood of attendance

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Smith et al. (2011) *Australia*	Cross-sectional survey; random opportunity sampling	4052 women with sexual experience and a fixed telephone line	*Attendance:* 2 item (past 2 years and age of recent test)	*Behaviour:* 7 items (sexual history, alcohol use, tobacco use)	*Attendance:* Tobacco use (OR=0.90, 95%CI 0.86-0.95)*** and number of sexual partners (OR=0.91, 95%CI 0.84-0.99)* associated with lower odds of CS; alcohol use (OR=1.08,95%CI 1.03-1.13)** associated with higher CS
Tacken, et al. (2008) *Netherlands*	Cross-sectional survey; opportunity sample	1392 women aged 30-60	*Attendance:* From GP records	*Behaviour:* Self-reported risk behaviour (2 items) *Cognitive:* beliefs about screening and attendance (17 items on 5 point Likert Scale)	*Attendance:* Moral obligation (OR=2.36, 95%CI 2.00-2.78)* and less sexual partners (OR=0.63, 95%CI 0.48-0.84)* significantly related to increased attendance likelihood
Waller, Bartoszek, Marlow, and Wardle (2009) *England*	Retrospective survey; stratified random probability sampling	580 women aged 25+ living in England	*Attendance: 1* item, 1 option statement selected	*Cognitive:* perceived emotional barriers	*Attendance:* Positive relationship with reduced trust (OR=8.07, 95%CI 1.77-36.71)**

Authors and country	Design and sampling method	Participant details (number, inclusion criteria, mean age)	Outcome variables	Independent variables	Findings
Walsh (2006) *Ireland*	Cross-sectional survey; random sample	465 women aged 25-60 from Irish Screening Programme Register	*Attendance:* Within 3 months	*Cognitive:* Knowledge (1 item, 5 possible responses), perception of risk of CC (2 items, 5 point Likert scale), perceived barriers (6 items, 5 point Likert scale); *Behaviour:* past experience (6 items, 5 point Likert scale)	*Attendance:* Attendance significantly related to a good previous experience (t=1.93)*** and greater perceived risk of CC (t=2.12,df=956)*. Attenders had more knowledge than non (χ^2=10.27;df=1)***. Non-attenders perceived CS to cause more distress (t=2.99)**; feel more afraid (t=2.26)* and endorse more perceived barriers compared to attenders (t=6.42)***

Note. CC=cervical cancer; CS=cervical smear; *M*=mean age in years, *p<.05; **p<.01; p<.001***; HBQ=Health Belief Questionnaire; NAPAC=National Association for People Abused in Childhood; NSW= New South Wales, Australia; AOR=adjusted odds ratio; PR=prevalence ratios; ns=non-significant.

2.4.3 Relationship between Psychological Variables and Intention

2.4.3.1 Behavioural

The relationship between health-promoting behaviours and intention to attend CS was analysed in two studies. Of these, a large-scale cohort study using a dichotomous outcome measure found a significant positive relationship between being HPV vaccinated and intention. However, a cross-sectional study using a six-point Likert scale for intention in younger women found a non-significant relationship. Previous participation in CS was significantly positively related to intention (n=1).

2.4.3.2 Psychosocial Variables

Social support was significantly positive related to intention (n=1).

2.4.3.3 Cognitive

Positive attitude, such as believing CS are important (n=2), higher levels of perceived risk of CC (n=1) and knowledge of CS and CC (n=1) related to higher levels of intention (n=2).

2.4.3.4 Affective

Only one study looked at the relationship between affect and intention. Women with a higher level of apprehension after testing and more positive affect after receiving results had higher levels of intention to attend again (n=1).

2.4.4 Relationship between Psychological Variables and Attendance

2.4.4.1 Behavioural Variables

Of the studies that looked at relationships between psychological variables and attendance, 17 looked at relationships with behavioural variables.

An inconsistent relationship was found between attendance and engagement in risky health behaviours. Studies looking at relationships between smoking and attendance attained contradictory findings. Three studies found that women who smoked were more likely to attend their CS. This was found within large-scale populations and more specific groups, for example, women with a learning disability. Two large-scale population studies found an opposing relationship, where smoking was related to lower levels of attendance. These studies used self-report measures. A further study, which used a GP database for the outcome measure, found a non-significant relationship between attendance and smoking. Finally, one study found that individuals who were planning to or contemplating quitting smoking were more likely to attend their CS. All of these studies were rated comparably on the methodological quality assessment, suggesting the contradictory findings are not evidently due to the study design.

Sexual activity, including being sexually active and number of sexual partners, was associated with higher levels of attendance in CS (n=5) and a history of no sexual behaviour was related to lower levels of attendance (n=1). However one large-scale population study, which used GP records to measure attendance, found women who reported fewer sexual partners had higher levels of attendance. Furthermore, a methodologically comparable study found no significant relationship between sexual activity and CS attendance (n=1).

A more frequent or higher use of alcohol was associated with higher CS attendance (n=3) and similarly non-attendance was related to not drinking alcohol (n=1). A

further study, however, found a non-significant relationship between alcohol use and attendance. Drug use was not related to attendance (n=1), and obesity was related to lower attendance (n=1).

There was a consistent relationship between health-promoting behaviours and attendance. Use of contraceptives (n=1), accessing outreach services (n=1), having had a recent gynaecological checkup (n=1), mammogram (n=1) or contact with health professionals (n=1), were all associated with higher levels of attendance. These findings were supported by studies showing women who did not use condoms (n=1) or contraceptive pills (n=1) had lower attendance rates.

A history of childbirth was found to significantly increase likelihood of participation in CS (n=4). This was found in both cross-sectional surveys and cohort studies, where data in the cohort study was drawn from a medical review, demonstrating a consistent relationship.

2.4.4.2 Psychosocial Variables

Immigration, defined as the individual or their parents being born outside of their residing country, related to lower attendance (n=5). One study showing a non-significant relationship was a smaller cohort study drawing on a specific population of sex workers. Lower attendance was related to lower levels of heritage acculturation, defined as affiliating more with their heritage culture (Chang, Woo, Gorzalka & Brotto, 2010).

Non-attendance was higher in women who rated themselves to have poor health (n=1) and higher self-rated quality of life was related to higher attendance (n=1). A good previous experience with CS (n=1) increased the likelihood of attendance and experiencing a barrier to attendance in the past was associated with lower attendance (n=1).

2.4.4.3 Cognitive Variables

Higher levels of knowledge of CC and CS related positively to attendance (n=3) and poor knowledge related to lower attendance (n=1). A non-significant difference in knowledge levels was found between attenders and non-attenders using bivariate analysis.

Positive belief and attitudes about having a CS were consistently related to higher attendance (n=5). Beliefs around moral obligation (n=1) and more of a need for cognitive closure (n=1) also both increased the likelihood of CS attendance. Similarly, negative attitudes (n=1), negative outcome expectancies (n=2) and higher levels of perceived risk of developing CC (n=1) related to reduced attendance.

The relationship between perceived barriers and attendance was inconsistent (n=6). Fewer perceived barriers significantly increased the likelihood of attendance (n=3) and higher levels of perceived communication barriers related to lower attendance (n=1). However two studies found perceived barriers and attendance were non-significantly related. One of these used non-theory-driven items in their measure of barriers, offering a possible explanation for this inconsistency. Self-efficacy, both general and barrier related, were both significantly positively related to CS attendance

(n=2). Finally, cognitions related to improving health and wellbeing did not significantly relate to attendance (n=1).

2.4.4.4 Affective variables

Relationships between measures of emotions and attendance were predominantly consistent. Higher levels of fear/anxiety (n=4), embarrassment (n=1) and lower levels of trust (n=1) all predicted lower CS attendance. Although one study found a positive significant relationship between depression and CS attendance, this was significantly moderated by age as younger women with depression were more likely to attend compared to older women who when depressed, were less likely to attend.

2.4.4.5 Relational variables

Women with a secure attachment were significantly more likely to have had a recent CS (n=1) and higher levels of attachment anxiety and attachment avoidance significantly negatively related to attendance. Social support (n=1) was significantly related to attendance

2.4.5 Methodological appraisal

The author and undergraduate psychology student appraised the majority (90%) of the final studies included in the review separately using the appraisal tool (Table 2). Disagreements were evaluated by the author's academic supervisor. A ( ) signified the study met criteria; a (x) meant the study was rated as not meeting criteria; and (-) indicated the study did not contain enough information for that criterion to be appraised (Table 3).

One study out of the 38 included in the review scored six out of six on the appraisal rating scale, indicating it met all appraisal criteria. Seven studies scored five out of six, 14 scored four, nine scored three, five scored two and two scored one out of six. No studies received a score of zero.

In terms of sampling, 21 were deemed to have used an unbiased recruitment strategy, meaning almost half (n=17) were rated as using recruitment methods open to bias. This primarily indicated using an opportunity or convenience sample, therefore reducing the external validity of the study and the potential to generalise findings. Most studies were rated as having a representative sample for their population (n=27); one study could not be rated due to lack of information about the sample and population. Response rate could not be calculated for most studies (n=17) as they drew on previously collected data or were open to an unknown population size. Of those able to be appraised, 14 had an acceptable response rate (60% or above) and seven did not.

Table 2: Methodological Appraisal Tool

Methodological Appraisal Criteria
1) Was the sample recruited in a way to minimise bias? Yes: Either a whole population study, or if probability sampling occurred, they used a random or stratified recruitment method No: Non-probability sampling occurred such as opportunity or convenience sampling
2) Was the sample representative? Yes: - The demographics represent the target population; - There is a clear inclusion/exclusion criteria reported to confirm the above; - Non-attender characteristics were compared to attenders; - All the population eligible? No: None of the above
3) Was the outcome variable measured in a reliable and valid way? Yes: - More than one question was asked related to attendance/intention for self-report - Or data was taken from a database No: Only one self-report question asked
4) Was there an acceptable response rate (60% or above)? Yes: If 60% or more of the people asked agree to participate No: If less than 60% agreed to take part
5) Were psychological variables measured using valid and reliable measures? Yes:- If authors used any standardised measures - If authors referenced where their questions came from - If measures had established reliability and validity No: - If they generated their own questions with no reference to where the questions came from
6) Were possible confounding variables noted and accounted for in analysis? Yes: - The study included multivariate analysis, for example multiple regression, logistic regression, ANOVA, ANCOVA, or partial correlation No: - The study included only simple bivariate analysis such as t-test or correlation

The measures used for the outcome and psychological variables were rated. The majority of studies (n=22) used a reliable and valid measure for the outcome measure, meaning more than one item was used, the measure drew on a reliable source such as GP records, or items were referenced from previous studies. The remaining studies

(n=16) were rated as using less reliable or valid outcome measures. For measuring psychological variables, 18 were rated as using a reliable and valid measure and 20 studies were not, indicating the authors employed self-developed measures, rather than previously used or standardised measures.

The quality of analysis was rated based on the use of multivariate analysis to control for confounding variables, thereby increasing the internal validity of the study. A total of 34 studies were deemed to have controlled for possible confounding variables in their analysis with only four not meeting this criterion.

Table 3: Quality appraisal outcome

Authors	Unbiased recruitment method	Representative sample	Acceptable response rate	Valid and reliable outcome measure	Valid and reliable measures of psychological variables	Confounding variables controlled for
Bish et al. (2000)	x		x			
Broughton and Thomson (2000)	x		x			x
Cadman et al. (2012)	x	x	-		x	x
Cerigo et al. (2013)	x				x	
Chang et al. (2017)			-	x	x	
Chang et al. (2010)	x	x	-		x	
Choi et al. (2013)			-			
Cockburn et al. (1992)			x	x	x	
Duff, et al. (2016)			-		x	
Eiser and Cole (2002)	x	x				
Falasinnu (2011)						
Girgis et al. (1999)	x			x	x	
Goel (1994)			-	x	x	
Hansen et al. (2011)					x	
Hestbech et al. (2016)			x		x	

Authors	Unbiased recruitment method	Representative sample	Acceptable response rate	Valid and reliable outcome measure	Valid and reliable measures of psychological variables	Confounding variables controlled for
Hill and Gick (2011)	x	x	-	x		
Hill and Gick (2013)	x	x	-	x		
Hislop et al. (2003)		x		x		
Idehen, et al. (2017)				x	x	
Kaida et al. (2008)			-			
Khadilkar and Chen (2013)			-	x	x	
Knops-Dullens et al. (2007)	x		x			
Korfage et al. (2018)	x			x		
Kreuger et al. (1999)			-			
Leinonen et al. (2017)	x		-			
Lo et al. (2013)	x		-	x	x	
Lovell et al. 2015)	x	x		x	x	
Luszczynska et al. (2012)	x	x	-			
Mather et al. (2012)		x				
Östensson et al. (2015)	x			x	x	

Authors	Unbiased recruitment method	Representative sample	Acceptable response rate	Valid and reliable outcome measure	Valid and reliable measures of psychological variables	Confounding variables controlled for
Park et al. (2002)	x	-	-	x		x
Park and Park (2010)					x	
Perkins et al. (1999)			-			
Savage and Clarke (2001)		x		x		
Smith et al. (2011)			x		x	
Tacken, et al. (2008)			-		x	
Waller et al. (2009)				x	x	
Walsh (2006)			x		x	x

2.5 Discussion

The aim of this review was to explore relationships between psychological variables and intention to and attendance of CS. Thirty-eight studies were identified as quantitatively analysing relationships between psychological variables and women's intention to and attendance of CS in countries with organised screening programmes. Although the majority of studies focused on relationships with attendance, the findings emphasise the role of psychological variables in explaining both intention and attendance.

2.5.1 Behavioural Variables

Health-promoting behaviours were most consistently related to attendance, consistent with previous research (Bankhead et al., 2003), however not to intention. The use of health services as a predictor for attendance (Olesen, Butterworth, Jacomb, & Tait, 2012) may be explained by the role of self-efficacy, as high self-efficacy predicts a health-promoting lifestyle (Jackson, Tucker, & Herman, 2007). This may be because self-efficacy increases motivation (Schwarzer & Fuchs, 1995), which is necessary for engagement in health behaviours. Furthermore, individual's who endorse more positive outcome expectancies as to the effectiveness of these behaviours are likely to engage in more similar behaviours (Schwarzer & Fuchs, 1995). This therefore may explain the association between engaging with different health-promoting behaviours, as women view the benefits as outweighing the cons, and have identified personal beneficial reasons to attend. The different relationship found with intention maybe due to situational factors, whereby women attending other healthcare appointments are offered a CS. This would therefore influence their attendance but not their

intention, and may also explain the positive relationship between childbirth and attendance.

Risky health behaviours ambiguously related to attendance: smoking and sexual activity showed inconclusive findings, whereas alcohol consumption was related to higher attendance. The varied findings between smoking and sexual behaviour, and attendance, is not easily explainable at a methodological level, due to the use of large scale population studies, drawing on multivariate analysis concluding both positive and negative relationships with attendance. For example, although the majority of studies highlighted a positive relationship between sexual activity and attendance, one methodologically sound study contradicted this by identifying a negative relationship. There maybe a number of reasons for this including the recruitment of a slightly older age group (30-60) in comparison to other studies, as younger age groups report higher levels of sexual activity (Addis et al., 2006) yet have lower attendance rates (Jo's Cervical Cancer Trust, 2017). Alternatively these inconsistencies could be due to the use of self-report measures for sexual behavior potentially yielding unreliable results, due to social desirability bias. Additionally, possible confounding variables, may offer an explanation. Personality, for example, moderates the relationship between risky health behaviours and perceived susceptibility (Terracciano & Costa, 2004; Vollrath, Knoch, & Cassano, 1999) and smokers have higher levels of neuroticism (Terracciano & Costa, 2004), which correlates to CS attendance (Neeme, Aavik, Aavik, & Punab, 2015). These unmeasured variables may explain the inconsistent findings. Furthermore, it is important to consider the role of psychological variables, which may influence an individual's relationship with smoking but not CS. For example, a barrier to smoking cessation is loss of coping resources, (Kerr, Woods, Knussen,

Watson, & Hunter, 2013), which is less applicable to CS attendance. Finally, the role of perceived self-efficacy relates to an individual's belief they can change risky health behaviours and adopt health-promoting behaviours (Schwarzer & Fuchs, 1995) therefore may mediate this relationship.

Contrary to research highlighting a relationship between risk behaviours and non-compliance of health-promoting behaviours (Galan et al., 2006), attendance and alcohol consumption were positively related. Previous research reporting this finding, for example Sutton, Bickler, Sancho-Aldridge and Saidi (1994), has been criticised for the use of the dichotomous variable "ever having drunk alcohol" (Cook & Clark, 2005) which may have generated erroneous conclusions. A range of measures was used in this review, however, including frequency and type of alcohol consumed, suggesting a valid positive relationship between alcohol consumption and attendance. This discrepancy could be explained by moderating demographic characteristics as previous research shows higher levels of CS attendance and alcohol consumption (Fylan, 1998; Hawkins, et al., 1997) in white ethnicities. An alternative explanation can be drawn from the methodological limitation of potentially unreliable self-report measures of alcohol use. This indicates the need for further research to explain the mechanisms behind this relationship to aid understanding.

The inconsistent relationships with behavioural variables, suggest alternative psychological variables may offer more robust clinical explanations of the variance in attendance and intention. Focus on other variables may therefore be more beneficial when considering interventions to target declining CS attendance.

2.5.2 Cognitive Variables

The importance of cognitive variables, particularly knowledge, perceived risk and attitudes, was demonstrated by the consistent relationships with both intention and attendance. These relate to three of the factors identified to exist across 14 different health behaviour models (Cummings, Becker, & Maile, 1980). The Theory of Planned Behaviour and in particular the Health Belief Model, have previously been found to explain a limited amount of the variance for intention (Bish et al., 2000). The findings here, however, suggest that considering certain cognitive variables is helpful in explaining attendance to CS, supporting findings from Tanner-Smith and Brown's review (2010).

2.5.3 Affective Variables

Negative affect was linked to lower attendance and intention across studies and the only contradictory study identified age as a moderating factor. Fear and worry, were highlighted most frequently as relating to reduced attendance. As these emotions are related to risk-averse choices (Lerner & Keltner, 2001), the use of avoidance coping mechanisms could explain the lower attendance. The evident role of affective factors in understanding intention and attendance support criticisms for the lack of acknowledgement of emotions in some social cognitive theories of health behaviour (Walsh, O'Reilly, & Treacy, 2003).

2.5.4 Psychosocial

Consistent with previous research (Ekechi, et al., 2014), participation in CS was found to be lower in women considered as immigrants, excluding one study using a

sample of sex workers. Potential explanations could be practical barriers such as lack of CS in their native country or a current language barrier leading to a lack of engagement with health services. However, as the classification criteria included in this review was varied, and included the woman's parents' place of birth, this indicates alternative explanations. One possibility is ethnicity, which has consistently been associated with attendance (Moser, Patnick, & Beral, 2009; Waller, et al., 2009).

2.5.5 Strengths and limitations of the studies

The quantitative design and use of opportunity samples enabled the recruitment of large sample sizes, thus increasing the generalisability of the results. Although recruitment strategies may have inadvertently increased bias, results were often replicated across study designs, meaning potential representative bias may have been managed. Alongside the use of multivariate analysis to control for potential confounding variables, this indicates possible threats to external validity may have been managed.

The use of cross-sectional designs and retrospective data was the most practically appropriate methodology due to the time lapse between each CS (3-5 years). Consequently it is not possible to determine causational relationships and this reduces the strength of inferences that can be drawn. As such, alternative explanations maybe plausible and temporal relationships cannot be inferred. The use of self-report measures of attendance means results maybe open to social desirability, recall or specificity bias. However, despite these potential threats to validity, comparable results were demonstrated in both cross-sectional and cohort studies, and no distinct

differences were identified in findings from studies using self-report or database measures.

Comparing and combining of results from different studies should occur with caution due to the variety of outcome measures used. This is particularly when interpreting studies using a mix of subjective and objective measures, such as combining attendance rates from databases with self-report behavioural measures, due to lower scale correspondence (Courneya, 1994). Intention was often not measured, despite suggestions it is a possible mediating factor (Conner & Norman, 2005), therefore its potential influence should also be considered.

2.5.6 Strengths and limitations of the review

This review highlights the importance of psychological variables for explaining intention or attendance to CS. Additionally, it adds to the understanding of the relationship between intention and attendance by highlighting similar and different variables associated with these outcomes.

The use of a clear search strategy enables future replication of this review. The lack of an application of a model or theory in the search strategy enabled a wider range of psychological variables to be identified and explored. Focusing on quantitative studies allowed for large sample sizes to be compared, therefore increasing the generalisability of the results. This was further added to by the range of demographic characteristics of participants in the studies, further enhancing the external validity of the findings. The use of narrative synthesis enabled findings from the studies to be

combined, despite the level of methodological heterogeneity. However, the limitation in the search strategy to published studies written in English may act as a threat to validity, as these studies may be systematically different to non-English studies (McDonagh, Peterson, Raina, Chang, & Shekelle, 2013) therefore may affect the results. Furthermore, due to the scope of the study, searches were mainly in title only. This could have led to very high levels of specificity, meaning some studies may have been excluded. Finally, the inclusion of only two databases may have led to relevant articles being missed.

2.5.7 Future directions

This review highlights the importance of psychological variables to understand intention and attendance of CS. The recent decline in CS uptake, paired with research identifying the importance of CS for identifying CC, means the understanding of barriers to CS uptake is crucial for women's health. The range of variables identified supports findings in Chorley et al.'s (2017) review. It highlights the importance of considering non-attenders as heterogeneous and supports their recommendation of analysing subgroups differently. The focus on behavioural variables within research indicates a need for further research particularly into relationships between affective variables with intention and attendance. In addition, more research regarding the lower attendance rates amongst migrants is important and emphasises the importance of research into health behaviours within under represented groups.

The strong relationships demonstrated between knowledge and attendance emphasise the need of health promotions to ensure women have enough knowledge about CS

and CC in order to make an informed decision about CS attendance. As only one study drew on an experimental design, longitudinal experimental research developing the findings in this review would increase our understanding of variables related to attendance.

As organised screening programmes are worldwide, replicating this review to involve studies not written in English would allow psychological barriers prevalent in other countries to be identified, to explore whether certain variables are consistent across cultures. The limited number of studies exploring relationships with intention indicates the need for further research in this area, as intention does not always translate into CS attendance (Orbell & Sheeran, 1998).

2.5.8 Conclusion

This systematic review identifies the range of psychological variables related to CS uptake, and the importance of considering these variables to understand the declining CS uptake. Significant relationships between cognitive and affective variables, to both intention and attendance, were identified across large sample sizes and varied populations. Experimental research establishing the causal direction of these relationships would help to identify targets for interventions to improve CS uptake.

3 Understanding the Relationship between Sexual Assault and Cervical Smear Uptake

3.1 Abstract

Women who have experienced sexual assault have been identified as having lower levels of cervical smear (CS) attendance. This is particularly worrying due to their increased risk of developing cervical cancer (CC).

At present, no theory-driven research has occurred to help understand what factors are related to intention to and attendance of CS (CS uptake). The Health Action Process Approach (HAPA) is a health behaviour model that aims to explain intention to and ongoing attendance to health-promoting behaviours. The HAPA model was used to inform this study, with the aim of increasing understanding of barriers and facilitators to CS uptake, in women who have experienced sexual assault.

An online study was conducted to explore whether HAPA variables, trauma variables and other potentially confounding factors were related to CS uptake in women who have experienced sexual assault. Multiple regression, hierarchical regression and mediation analyses were conducted to test hypotheses around the role of self-efficacy in understanding intention and attendance. The results indicated that task self-efficacy predicted intention, and mediated relationships between HAPA variables and intention to attend CS. Maintenance self-efficacy predicted attendance, and mediated relationships between HAPA variables and reported past attendance. Trauma

variables (nature and age of abuse, and level of trauma symptoms) did not predict intention or attendance over HAPA variables.

The study emphasises the role of self-efficacy in understanding CS uptake in women with a history of sexual assault. The importance of considering and targeting self-efficacy to improve CS uptake in women who have experienced sexual assault, is considered in terms of clinical implications.

3.2 Introduction

3.2.1 Cervical Smears (CS)

Approximately 3,200 women are diagnosed with and 1,000 women die from cervical cancer (CC) each year in the UK (Cancer Research UK, 2015; NHS, 2015). The introduction of the NHS cervical screening programme has noticeably reduced these figures, with recent data suggesting CC related mortality would be over three times higher without screening (Landy, Pesola, Castañón, & Sasieni, 2016). However, CC is still a public health burden, and the declining rates of cervical smear (CS) attendance over the past five years are concerning (NHS Digital, 2017). Current attendance guidelines in the UK are every three years for 25-49 year olds, and every five years for women aged 50-64 years (NHS, 2015a). However, only 72% of eligible women were up to date with screening in 2017, demonstrating a decline from 75.4% in 2012 (NHS Digital, 2017). Understanding reasons behind non-attendance and declining attendance is therefore crucial to reduce the number of women diagnosed with CC each year.

3.2.2 Understanding low CS attendance

Research into understanding and targeting the low and declining attendance rate, has identified specific groups with lower attendance rates. Women who are 25-29 years old, belong to an ethnic minority, are single, have a lower level of education or have experienced sexual assault, have been identified as attending less regularly (Bang, Yadgarfar, Soljak, & Majeed, 2012; Cadman, Waller, Ashdown-Barr, & Szarewski, 2012; Jo's Cervical Cancer Trust, 2017; Marlow, Chorley, Haddrell, Ferrer & Waller, 2017; Moser, Patnik & Beral, 2009; Sutton & Rutherford, 2005). Women who

struggle to translate intention into attendance have been identified as the biggest group of non-attenders (Marlow et al., 2017). Based on this, the authors highlight the need to focus on heterogenic approaches to targeting attendance, by identifying barriers within certain populations.

Improving understanding of CS uptake in women who have experienced sexual assault is particularly important as one in five women are estimated to have experienced a sexual assault since the age of 16 (Office of National Statistics, 2018a). Furthermore the number of women reporting a sexual assault has increased by 25% in the past 10 years (Office of National Statistics, 2018b). The need for research in this area is intensified by the relationship between sexual assault and increased risk of CC (Farley, Golding, & Minkoff, 2002). This relationship can potentially be understood through the association between a history of sexual assault and higher levels of risky sexual behaviour in adulthood (Kendall-Tackett, 2002; Senn & Carey, 2010), which is a risk factor for human papillomavirus, a cause of CC (NHS, 2015b). This risk is heightened, as women who have experienced childhood sexual abuse (CSA) engage with more health risk-behaviours, have poorer health status, and have a lower up to date CS attendance rate of 42% compared to the national average of 72% (Cadman et al., 2012; Felitti et al., 1998; Koss, Koss & Woodruff, 1991). Further understanding into these differences is vital, and highlights the need to identify variables related to attendance within this client group, to inform interventions targeted specifically for these women.

3.2.3 Understanding CS attendance within this group

Literature exploring CS uptake in women who have experienced sexual assault has identified potential barriers to attendance. These include perceived experiences of emotional distress (Weitlauf et al., 2010), feelings of shame and vulnerability (Robohm & Buttenheim, 1996), and anxiety about feeling out of control (Watson, 2016). Women who experienced CSA also report experiencing trauma symptoms due to gynaecological examinations (Robohm & Buttenheim, 1996). Trauma symptoms describe intrusive thoughts, feeling overwhelmed and detached, and unwanted mental and physical memories. As described in Robohm and Buttenheim, and as will be used in this thesis, trauma symptoms relate to a diagnosis of post-traumatic stress disorder (PTSD; American Psychiatric Association (APA), 2013), however do not assume an official diagnosis. Physical elements of the CS, such as the insertion of the vaginal speculum, or lying on their back, can remind women of their trauma and trigger trauma symptoms, due to the similarities (Robohm & Buttenheim, 1996; Watson, 2016). Understandably, worry about experiencing these responses can be a barrier to attendance (Cadman et al., 2012). As well as trauma symptoms, the nature of the trauma also relates to CS attendance. Farley et al., (2002) found the experience of CSA related to lower levels of CS attendance than adult experiences of sexual assault did, even after trauma symptoms were accounted for. This relates to findings that more severe abuse, classed as penetrative abuse or multiple perpetrators, relates to more medical problems and engagement in risky health behaviours (Springs & Friedrich, 1992). These results may imply a role and potential interaction between the nature of the trauma and subsequent trauma symptoms in regards to the impact on the individual. However, models of psychological responses to trauma emphasise a complex relationship between cognitive, emotional, and experiential factors in

understanding the impact of trauma (McCann, Sakhein, & Abrahamson, 1988). It is therefore important to acknowledge potential mediating individualistic factors to fully understand the relationship between sexual assault and CS uptake. Furthermore, Cadman et al.'s (2012) finding that only 39% of women who had experienced CSA had attended a CS in last year highlights both the low attendance rate and variability within this group by illustrating some women who experience CSA, attend their CS.

3.2.4 Health behaviour literature

The understanding of individual difference in attendance to CS in general populations has been facilitated by health behaviour literature. The health belief model (HBM) is one of the most widely used models and has been applied to a range of health behaviours within multiple different populations, enabling the development of multiple health promotion interventions (Abraham & Sheeran, 2005). Another key theory, the theory of reasoned action (TRA) has enabled further understanding into how beliefs and the influence of others may impact on behaviour through the incorporation of intention formation (Abraham & Sheeran, 2005). Health behavior literature applied to CS shows that better knowledge of CC, the screening procedure and the benefits of CS, relate to higher CS attendance (Fylan, 1998), and a lack of information about the need or what a CS entails, are barriers to attendance (Eaker, Adami, & Sparen, 2001). The HBM (Rosenstock, Stretcher, & Becker, 1988), when applied to CS attendance, identified perceived cognitive barriers of pain and unpleasantness as potential explanations for low attendance (Gillam, 1991). The Theory of Planned Behaviour (TPB) found attitudes about the importance and benefits of CS, significantly predicted intention to attend (Bish, Sutton, & Golombok,

2000). Although these provide evidence of a role of cognitive variables in understanding CS uptake, Bish and colleagues found neither the HBM nor the TPB explained a significant amount of variance in CS uptake. This is potentially because social-cognitive models have been criticised for not accounting for emotional factors related to health behaviours (Walsh, O'Reilly, & Treacy, 2003). These are important as factors such as embarrassment, anxiety about the procedure being painful, and worry about the result, act as barriers to CS for women from a range of population groups (Byrd, Peterson, Chavez, & Heckert, 2004; Oscarsson, Wijma, & Benzein, 2008; Sutton & Rutherford, 2005; Van Til, MacQuarrie, & Herbert, 2003; Waller, Bartoszek, Marlow, & Wardle, 2009). Systematic reviews highlight further limitations to these models, as variables not accounted for within them, such as self-identify and personal responsibility, relate to health behaviours (Godin & Kok, 1996). Furthermore, these models fail to explain why women may intend to but not attend their CS (Godin & Kok, 1996). The HBM and TPB also imply a linear pattern of behavioural change (Schwarzer & Luszczynska, 2008); however for women who experience trauma at different ages, this pattern is likely to be less applicable. In addition, the lack of a post-intentional phase in these models (Schwarzer & Luszczynska, 2008) reduces their ability to account for the intention-behaviour link and they do not account for ongoing behaviours, as is necessary for CS (Rothman, Baldwin, Hertel & Fugelstad, 2004). This limitation also applies to the Transtheoretical Model (Prochaska & DiClemente, 1983) which fails to explain why women may intend to but not attend their CS (Godin & Kok, 1996) due to the assumption that processes required to initiate a behaviour are the same to maintain it (Rotham, 2000). As previously highlighted, the intention-behaviour gap (Sheeran,

2002) is particularly important within CS, especially as intention often does not translate into CS attendance (Orbell & Sheeran, 1998).

3.2.5 The Health Action Process Approach (HAPA)

The HAPA (Schwarzer, 2008) contributes to this gap in research by acknowledging different variables that relate to intention and attendance. The HAPA combines constructs from other social cognitive models such as health beliefs from the HBM in the form of outcome expectancies (Abraham & Sheeran, 2005). Additionally, the inclusion of self-efficacy has been related to the role of perceived behavioural control in the TRA (Luszczynska & Schwarzer, 2005). The model (Figure 2) illustrates individuals need to recognise risks associated with not engaging in a health behavior (risk perception), consider the outcome as more beneficial than damaging (outcome expectancies) and believe in their capabilities to perform the behavior (task self-efficacy) to form an intention (Schwarzer, Lippke, & Luszczynska, 2011). For the purpose of this thesis, these variables will be called 'intention variables'. The HAPA describes transforming the intention into behavior through a detailed plan regarding completing the behaviour even if faced with barriers (action and coping planning) and believing they can persist with the behavior if faced with potential challenges, including missing a CS (maintenance and recovery self-efficacy). These will be described as 'attendance variables'. The benefit of this model for CS is its ability to explain ongoing health behaviours (Sutton & Rutherford, 2005). Moreover, it can be adapted to address population specific barriers through the development of idiosyncratic HAPA inventories. The HAPA has been used to develop interventions aimed at increasing CS attendance (Luszczynska, Goc, Scholz, Kowalska, & Knoll,

2011) by encouraging women to focus on the advantages of CS attendance, however has not yet been applied to understanding CS uptake.

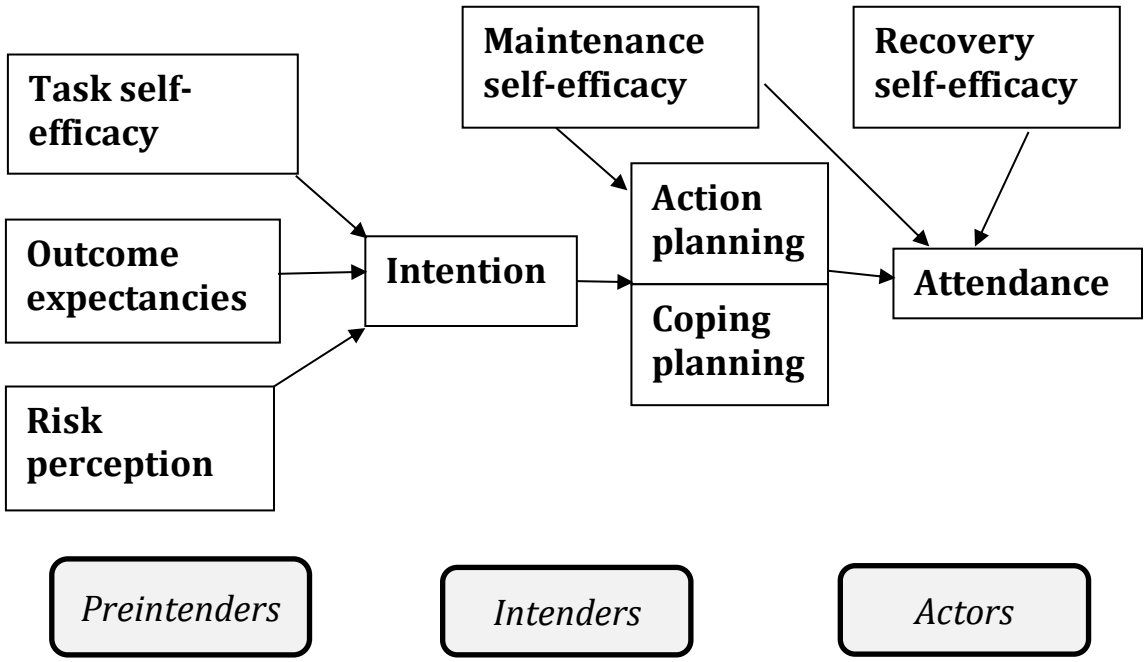

Figure 2: HAPA model (based on Schwarzer, 2008)

3.2.6 The role of self-efficacy

The effectiveness of the HAPA at explaining variance in health behaviours has been linked to the inclusion of three types of self-efficacy, a key predictor of health behavior initiation and maintenance (Bandura, 1977; Perkins & Jenkins, 1998; Rosenstock et al., 1986). Self-efficacy facilitates implementing behaviours and persisting despite barriers, and affects an individuals' emotional reaction to a task (Bandura, 1977). The latter aspect is particularly pertinent in this client group, as emotions such as fear and anxiety, have been identified as barriers to CS attendance (Cadman et al., 2012). Within this population, self-efficacy plays an additional role by determining health-related outcomes (Luszczynska, Benight, & Cieslak, 2009). This

may be because self-efficacy impacts on coping strategies, emotions, PTSD symptoms severity and general distress, which in turn can lead to health consequences (Benight & Bandura, 2004). As such, focusing on different types of self-efficacy (Luszczynska & Schwarzer, 2003) may aid understanding of CS uptake in women who have experienced sexual assault.

3.2.7 The importance of understanding CS uptake

Psychological factors related to CS uptake can offer a tangible focus for interventions aimed at increasing CS uptake for women with a history of sexual assault. Targeting psychological variables, as shown by experimental studies focused on self-efficacy, have generated positive changes to health behaviours (Luszczynska, Tryburcy, & Schwarzer, 2006). For example, interventions focused on addressing psychological barriers such as risk perception, outcome expectancy and self-efficacy, through increasing women's confidence in their knowledge of CS and CC, have led to higher levels of CS uptake (Miller et al., 1997; Park, Chang, & Chung, 2005). Other interventions including forming an implementation intention, when individuals plan when, where and how they will attend screening (Sheeran & Orbell, 2000) and targeting health beliefs and perceived emotions (Dermitas, 2013) have also lead to increased attendance. However, a key limitation of this research is the lack of generalisation outside of general populations. Considering the findings highlighted above, interventions specific to the barriers to attendance endorsed by women with history of sexual assault are likely to be most effective.

Although Cadman et al. (2012) identified barriers to and improvements for attendance, they did not distinguish what enabled some women to be up to date with their CS and others not. Additionally, it was not possible to identify if barriers were endorsed equally by those up to date, and those not (Waller et al., 2009). Furthermore, the study focused on women who experienced CSA, which limits the ability to reliably generalise findings to women who experienced different sexual assaults (Farley et al., 2002). The exploratory nature of this study is reflective of the lack of theory-driven research in this area, therefore reduces the ability to understand underlying processes related to health behaviours, transfer knowledge and develop of interventions (Munro, Lewin, Swart, & Volmink, 2007).

3.2.8 Rationale for the current study

To our knowledge, there is no theory-driven understanding of CS uptake in women who have experienced sexual assault, which could inform interventions. This study therefore aims to add to the existing literature by looking at facilitative factors for intention and ongoing attendance to CS within women who have experienced sexual assault. An online study, including a purposefully designed HAPA inventory, will enable theory-driven research to identify variables related to intention and attendance of CS. To explore the role of individualistic factors, possible confounding variables including demographics, CC knowledge, nature of sexual assault and level of current trauma symptoms, will be included. The study will include women who have experienced sexual assault at any age and are eligible for the NHS CS programme.

Based on the literature identified above, the following hypotheses will be explored:

Hypothesis 1: Intention variables (task self-efficacy, risk perception and outcome expectancies) will predict intention, over and above other variables;

Hypothesis 2: Attendance variables (maintenance and recovery self-efficacy, action and coping planning) will predict attendance, over and above other variables;

Hypothesis 3a: Trauma variables (age, nature and trauma symptoms) will explain intention over and above other HAPA variables;

Hypothesis 3b: Trauma variables (age, nature and trauma symptoms) will explain attendance over and above other HAPA variables.

3.3 Methods

3.3.1 Design

A quantitative, cross-sectional questionnaire design was employed.

3.3.2 Ethics

Ethical approval was initially sought through NHS London South East Ethics Research Committee, requesting approval for recruitment both online and face-to-face at an NHS based charity. The main ethical concerns related to the potential for distress caused by the nature of the study and how this would be managed with the study being online. Approval was granted for recruitment online only on 25th May 2017 (Appendix 3).

3.3.3 Participants

The inclusion criteria were women who had experienced a sexual assault and received a minimum of one CS invitation. Fulfillment of the criterion for having experienced sexual assault was based on participants' answers to a measure regarding their sexual assault experience. To ensure reliable measurement of intention, an upper age limit of 65 years old was applied based on the NHS CS programme. No lower limit was set as age of first CS invitation differs between countries. Recruitment occurred online via social media sites of charities and support groups for women who have experienced sexual assault. Eighteen organisations advertised the study initially and groups and individuals shared these adverts further.

A power calculation was calculated based on a comparable study by Bish, et al. (2000), as this was a theory driven study looking at CS attendance using a health behavioural model and regression analyses. Drawing on the effect size of the relationship between intention and self-efficacy (Pearson correlation 0.49, 0.8 for power and .05 for alpha) a sample size of 44 was generated. A second calculation using effect size for the relationship between CS attendance and self-efficacy, (Pearson correlation 0.09, 0.8 for power and .05 for alpha) a sample size of 190 was generated. The minimum sample size of 44 was therefore aimed at to power intention calculations.

3.3.4 Materials

The questionnaire consisted of five measures.

3.3.4.1 Demographics

Demographic details (Appendix 4) were collected as possible confounding variables, including place of birth and age the individual came to the UK. This was incorporated to account for individuals who may have moved to the UK from a country without an established call-recall CS programme and those from countries with different recommendations for age of first CS. Further questions, based on the Cervical Cancer Awareness Measure (Cancer Research, 2007), asked about age, ethnic group, education level, relationship status and whether a family or friend had experienced CC. These were included as they are associated with CS uptake (Ackerson, Pohl, & Low, 2008; Chang et al., 2017; Elit et al., 2013; Hislop et al., 2013; Savage & Clark, 2001).

3.3.4.2 HAPA Inventory

The HAPA inventory (Appendix 5) consisted of 29 items and nine subscales. Similar to previous HAPA inventory designs (MacPhail, Mullan, Sharpe, MacCann & Todd, 2014) items were adapted from previous literature, which have demonstrated good reliability and validity. Some items were reversed to reduce bias from response style, where individuals answer regardless of content (Weijters, Baumgartner, & Schillewaert, 2013). To account for recent criticisms that reverse scored items lead to lower internal consistency caused by inattention and confusion (van Sonderen, Sanderman & Coyne, 2013), the scoring scale was reversed rather than the wording of the question. Average scores were calculated to two decimal places to ensure reliability.

Cronbach's alpha was calculated to check reliability of each HAPA subscale, and factor analysis to check validity, by ensuring all items related to the construct in question (Field, 2005). Outliers were identified for each subscale through the use of boxplots, and were questioned for their acceptability when they were more than three standard deviations away from the mean (Field, 2005).

Attendance was measured using three items to ensure high levels of validity and reliability. This develops previous research using one method, for example, asking participants to confirm if they have attended in a set time frame (e.g. Savage & Clark, 2001). Moreover, this would not account for women who may have received one invite but not attended their CS or women whose intention or attendance may have ceased following a sexual assault. The first measure was a percentage of number of CS attended from number of CS invited to. The second measure was a seven-point

Likert scale for agreement of *"In the past, I have gone for my cervical smear when invited"* (adapted from Sandberg & Conner, 2009). Thirdly, participants were asked when they last went for a smear (0-3 years; 3-5 years; 5+ years) (adapted from Eaker, Adami, Granath, Wilander, & Sparén, 2004). A correlation between Likert scale score and percentage was highly significant ($r(212)=.783$, $p<.001$) and a multiple regression showed the two continuous variables were significantly able to predict the categorical variable ($F(2,208)=38.1$, $p<.001$). This indicated high levels of reliability in the attendance measure. As a percentage could not be calculated for individuals who selected "don't know" for number of CS invitations (37 participants, 15%) the Likert scale item was used as the measure of attendance.

Intention was measured using two items (based on Orbell, Hagger, Brown, & Tidy, 2006) *"How much do you agree with the following statement: "I plan to attend a cervical smear in the next 5 years";* and *"How likely is it that you will attend your next cervical smear?".* Both questions used a seven-point Likert scale (extremely likely – extremely unlikely). Cronbach's alpha showed a very high level of agreement between the two items ($\alpha=.918$). To avoid loss of data, and allow for both behavioural intention and estimation to be calculated (Sheppard, Hartwick, & Warshaw, 1988) a total score of intention was calculated.

Risk perception consisted of one item for absolute risk of developing CC: *"I believe that the likelihood of me developing cervical cancer at some point in my life is..."*; and one for relative risk: *"The chance of someone my age developing cervical cancer at some point is…"* These were based on questions from Arbour-Nicitopoulos, Duncan, Remington, Cairney and Faulkner (2014) and Schwarzer (2008). Both were

based on a seven-point Likert scale (extremely likely -extremely unlikely). Items yielded a low alpha score (α=.596), however, as the high factor loadings of .846 indicated items related to a common construct, it was decided to use an average of the two scores.

Outcome expectancies focused on potential affective outcomes of having a CS, as recommended from piloting feedback from Arbour-Nicitopoulos et al. (2014). Answers were divided into positive and negative outcome expectancies. Negative outcome expectancies comprised of six items on seven-point Likert scales ranging from one (no emotion) to seven (the emotion in question). These were reversed for analysis so a low score would relate to high levels of negative outcome expectancy. Participants were asked *"For me, attending a cervical smear in the next 5 years would be: embarrassing/painful/unpleasant/distressing/frightening/anxiety provoking".* The content of these was informed by previous research in this area (Cadman et al., 2012). This yielded a high alpha level (α=.875) and factor loadings (.630-.864). The scale included three outliers above the recommended upper limit; however, tests of normality and correlations between intention and attendance were not altered by the inclusion or exclusion of these numbers. This is consistent with Bakker and Wichert's (2014) findings of limited difference in *p* value or errors, in articles that removed outliers and those that did not. In line with this and to maintain power, the outliers were not removed. An average score for negative outcome expectancy was calculated for each participant.

Positive outcome expectancies consisted of three scales, scored equivalently to negative outcome expectancies. Participants were asked to rate how much they felt a

CS would be: *important, necessary and worthwhile*. This yielded a high alpha score (α=.881) and high factor loadings ranging (887-.917) so an average score was calculated.

Task self-efficacy identified an individual's confidence in overcoming difficulties that may arise when attending their next CS. The two items were adapted from Schwarzer (2008), for example *"How certain are you that you can attend cervical smear tests regularly?".* Participants rated their response on a seven-point Likert scale (not certain at all-very certain). The subscale had a high Cronbachs alpha (α=.958) and high factor loading (.980) therefore an average score was calculated.

Maintenance self-efficacy consisted of five items identifying an individual's beliefs about their capability to cope with potential barriers to on going attendance such as feelings of worthlessness or negative emotions, for example *"I feel confident I can regularly attend cervical smears even if it causes me physical pain"*. These were based on questions from Schwarzer (2008) and were informed by research looking into barriers to CS attendance in women who have experienced sexual assault (Cadman et al., 2012). Answers were rated on a seven-point Likert scale (strongly disagree-strongly agree) and yielded a high Cronbachs alpha (α=.928) and high factor loading (.837-.912) therefore an average score was calculated.

Recovery self-efficacy consisted of two items focused on an individual's belief in their ability to resume attendance after not attending. These were based on Schwarzer (2008) for example *"I am confident I can continue to attend cervical smear tests even if I don't attend/cancel my first booking".* These were rated on a seven-point Likert

Scale (strongly disagree-strongly agree). The Cronbach's alpha was rated as acceptable (α=.602). Based on the considerations mentioned above and the high factor loadings (.846), an average score was calculated.

Action planning items were based on recommendations from Lippke, Ziegelmann and Schwarzer (2005). This asked individuals if, on a seven-point Likert scale (one = definitely not true; seven = definitely true) whether they knew: *"when/where/how they would get their next smear".* The Cronbach's alpha was good (α=.747) and high factor loadings were produced (.786-.835) so an average score could be reliably generated.

Coping planning included four items based on Arbour-Nicitopoulos, et al. (2014) focusing on an individual's ability to predict barriers and consider possible actions, for example: *"I feel confident I know how to cope if I get reminders of my trauma during or after the smear test".* These were rated again on a seven-point Likert scale from one (not confident at all) to seven (very confident). Initial Cronbach's calculation yielded a below acceptable level of α=.570, however removal of one item increased this to α=.816. The combination of the three remaining items yielded high factor loadings (.818-.917) therefore an average was calculated.

3.3.4.3 Cervical Cancer Awareness Measure (CCAM)

The CCAM (Appendix 6, Cancer Research, 2007) was included as lack of knowledge about the importance and purpose of CS, and risk factors for CC, all relate to lower CS attendance (Ackerson, 2012; Bahmani, Baghianimoghadam, Enjezab,

Mahmoodabad, & Askarshahi, 2016; Mamon et al., 1990). Women stating lack of symptoms as a reason for non-attendance (Kim et al., 1999) demonstrates this relationship, as symptoms of CC may not present until it is at an advanced stage (NHS, 2015b). The CCAM is a validated measure comprising of three sections about warning signs for CC, risks factors for developing CC and awareness of CS. Prompted rather than open questions were included as previous research has shows these generate higher average scores (Simon et al., 2012) enabling increased variability within the data. Section one includes 11 potential warning signs of CC, with a three-point answer scale of Yes/No/Don't know. For example: *"Do you think persistent lower back pain could be a sign of cervical cancer?".* Section two consists of 11 items about risk factors on a five-point Likert scale from Strongly Disagree – Strongly Agree: *"How much do you agree that each of these can increase a woman's chance of developing cervical cancer: Having many children?".* Section three included additional knowledge items, two of which were scored on a Yes/No/Don't know basis and one multiple-choice item. A total score was calculated: for each warning sign and knowledge question, "Yes" scored one, and "No" or "Don't Know" scored zero; for each risk factor, "Agree" and "Strongly Agree" scored one, and "Not sure", "Disagree" and "Strongly Disagree" scored zero. This was based on previous use of the CCAM (Hweissa, & Su, 2018). Internal reliability (Cronbach's α=.0.77) and test–retest reliability (r=0.81) for the measure are high (Stubbings et al., 2009).

3.3.4.4 Sexual and Physical Abuse Questionnaire (SPAQ)

The SPAQ (Appendix 7, Kooiman, Ouwehand, & ter Kuile, 2002) was included for three reasons. Firstly, to confirm the inclusion criteria that women had experienced a

sexual assault. Secondly, because the age an individual experiences sexual assault influences the strength of association with reduced CS attendance (Farley et al., 2002). Thirdly, previous research looking into the health consequences of sexual assaults recommends differentiating between types of sexual assault (Jina & Thomas, 2013). Participants were asked whether they had experienced different types of sexual assault with the options of: "As a child (15 years or younger)"; "As an adult (16 years or older)"; and "No". This was edited from the original questionnaire following service-user consultation (see below for further details). The nature of experiences included exhibitionism *(e.g. "Has anyone ever exposed the sex organs of their body to you when you did not want it?")* and rape *(e.g. "Has anyone ever forced you to have sex when you did not want this?").*

Feedback provided after recruitment commenced indicated the technicality of not being able to select both child and adult for some questions. This was problematic as women's risk of further sexual assault increases after experiencing CSA (Fleming, Mullen, Sibthorpe, & Bammer, 1999). Following alteration, participants could select multiple responses per question to allow them to select both childhood and adulthood. Participants were then grouped according to age abuse occurred (childhood, adulthood, both) and nature of their assault (sexual assault involving rape or sexual assault not involving rape). The grouping of nature of assault occurred due to parallels highlighted between rape and CS (Cadman et al., 2012).

3.3.4.5 The PTSD Checklist for DSM-V (PCL-5)

The PCL-5 (Appendix 8, PCL-5, Weathers et al., 2013) is a self-report measure including 20-items based on PTSD symptoms in the Diagnostic Statistical Manual of Mental Disorders 5 (DSM-V; APA, 2013). It is recommended as a clinical screening measure and for use in research. Participants were asked if they have been bothered by selected trauma responses within the past month for example *"Repeated, disturbing, and unwanted memories of the stressful experience?".* The measure included five-point Likert scale responses from "Not at all" to "Extremely." The PCL-5 was included as trauma responses such as flashbacks relate to lower levels of on going CS attendance (Weitlauf et al., 2010). The authors report strong internal consistency (α=.94), test-retest reliability (*r*=.82), and convergent (*r*s= .74-.85) and discriminant (*r*s = .31-.60) validity (Blevins, Weathers, Davis, Witte, & Domino, 2015). Due to a technical error, the final question of the PCL-5 was not recorded therefore mean imputation occurred as a conservative method for managing missing data (Meyers, Gamst, & Guarino, 2016).

The PCL-5 can be scored in a range of ways. Analysis of participants' scores highlighted an inconsistency between using a cut off score of 33 and a diagnostic approach, as 11 participants scored over the cut off however did not endorse all required items to meet diagnostic criteria. As such, it was decided to use participants' total score to indicate symptom severity. In line with reasons stated above and because the PCL-5 indicates only a provisional diagnosis of PTSD, the term "trauma-symptoms" will be used.

3.3.5 Procedure

3.3.5.1 Service User Consultation

Service user consultation occurred through a support group to gain feedback on the design of the study and the HAPA inventory to ensure it was relevant, appropriate and inclusive, as recommended by Arbour-Nictopolous et al. (2014). All service users (*n*=6) had experience of sexual assault. Participants were asked a range of questions about the design of the study including the use of an online platform, the order of questionnaires, specific wording used within the questions, advertising the study for recruitment, and any additional areas to include.

Feedback was positive regarding the use of an online platform as participants commented it was *"good"; "avoids pressure"; "is confidential"; "[I can] feel in control"; "[I] don't have to disclose anything in person".* Participants agreed the order of questionnaires with demographic measure first and PCL-5 last, due to its emotive subject. Due to the potentially upsetting nature of some questions, the group suggested including details of services women could access should they become distressed. These were therefore included in the information and debrief sheets. A brief description of a CS was also recommended to ensure fully informed consent regarding the subject of the study. The SPAQ was altered to collapse responses to three age groups, based on recommendations women may struggle to remember the exact age of CSA. Additionally, the wording of being touched "in a sexual manner" was removed, as this was indicated to potentially induce negative reactions. A key alteration was the adoption of the phrasing "women who have experienced sexual assault" as the words 'survivor' and 'victim' did not feel applicable to everyone. The

HAPA was re-ordered to separate constructs out to avoid confusion and Likert scale options included in the outcome expectancies items were altered to include more neutral responses. Finally, the addition of "don't know" and "prefer not to say" options were included into demographic questions.

Guidance related to internet-based research was consulted (British Psychological Society, 2017). Questionnaires were uploaded onto Qualtrics, an online platform which allowed service users to complete the study in their own time, in confidence, and stored data securely on a password protected online database, only accessible to the author. Women who met inclusion criteria, except for a history of sexual assault, piloted the online version of the study to check for user-friendliness. Following this, changes were made regarding the layout to ensure accessibility rather than word saturation across devices, and the study was named "Health Behaviour Study" to enable confidentiality for participation in a public place.

3.3.5.2 Main study

Multiple support groups and charities for women who have experienced sexual assault were contacted regarding advertising the study. Those that consented were provided with a potential study advert. One hundred and seven organisations were contacted and a total of 18 advertised the study on social media sites and newsletters beginning August 2017. Organisations that responded positively were re-contacted in January 2018 regarding re-advertising. Recruitment ended at the end of February 2018.

To ensure fully informed consent, participants consented to three tick boxes and were told they would be asked about their sexual assault (Appendix 9). Failure to consent

to all three directed the individual to the debrief page. To manage the potential distress caused by the research topic, contact details of available support organisations were provided in the participant information sheet (Appendix 10) and debrief sheet (Appendix 11). The debrief sheet was accessed at the end of the study or if participants clicked on the "withdraw" button at any point.

The survey was completely anonymous, therefore participants were provided with an ID number to enable their data to be removed at a later date if requested. Participants could also provide an email address to request a summary of the results. These were stored separately from their answers, in a password-protected document on a password-protected USB stick.

3.3.5.3 Data analysis

Checks for normality and descriptive statistics were calculated for each measure and HAPA subscale using SPSS 21. Bivariate analyses were done between all demographic variables and both outcome measures, and between HAPA variables and both outcome measures.

Multivariate analysis of multiple and hierarchical regressions were used to test hypotheses. Intention and attendance were entered into separate models as outcome measures, and HAPA variables were entered as predictor variables. Mediation analyses were conducted as exploratory analyses of the potential mediating role of self-efficacy on relationships between HAPA variables and outcome measures, and trauma symptoms and outcome measures.

3.4 Results

3.4.1 Initial Data Screening

Tests of normality involving calculations of skew and kurtosis and visual analysis of histograms, and identification of outliers through boxplot examination, were conducted for all variables (available from author on request). Unless otherwise commented on, assumptions of normality were met for each HAPA subscale and each measure.

3.4.2 Participants: Comparing Completers to Non-Completers

A total of 503 women logged into the survey and 285 consented to participate, indicating an implied response rate of 57%. After screening for inclusion criteria, one participant was excluded for not meeting the criteria of having experienced sexual assault. Out of the remaining participants, 37 dropped out after completing demographic data ("non-completers"). The final sample size was 247 ("completers"). Demographic variables between completers and non-completers were compared to check representativeness of the sample (see Table 4). For categorical data, Chi Square was completed and Fishers exact test reported when the expected cell count was less than five (Field, 2005). For continuous variables, independent t-tests were conducted. There was no significant difference in age of completers and non ($t(282)=.658$, $p=.511$). As the majority of the sample (85%) were White British/Irish, ethnicity was dichotomised into White British/Irish or Non-White British/Irish for power considerations. No significant difference was found between the number of White British/Irish or Non-White British/Irish in completers and non-completers ($\chi^2(1)=1.55$, $p=.213$). Relationship status was collapsed into "in a relationship"

(including being married) or "not in a relationship" (including being single, divorced or widowed) and no difference was found ($\chi^2(1)=.86$, $p=.354$) between the two groups. A high percentage of participants had completed a Bachelors Degree therefore groups were collapsed into highest education level of A –levels or those with a Bachelors Degree or above. No difference was found between completers and non-completers ($\chi^2(1)=3.04$, $p=.081$). The majority of participants (90%) were born in the UK and this was consistent across the groups ($p=.07$, Fishers Exact Test). Finally, the majority of participants did not know someone who had had CC (70%) with no significant difference between groups ($\chi^2(1)=.32$ $p=.85$). This indicates a high level of representativeness of the final sample.

3.4.3 Participants: Sample Demographic Data

A total of 247 participants were included in the final sample. Age range was 21-63 years old and all had been invited to at least one CS. Demographic details are described in Table 4.

Table 4: Demographic Characteristics of Completers and Non-Completers

Demographic Variable	**Completers (N(%))**	**Non-Completers (N(%))**
White British/Irish	212 (86%)	29 (78%)
Non White-British/Irish	34 (14%)	8 (22%)
Education level up to A-levels	77 (31%)	15 (47%)
Education level minimum Bachelors degree	168 (69%)	17 (53%)
Born in the UK	223 (90%)	33 (89%)
Not born in the UK	24 (10%)	4 (11%)
In a relationship	138 (57%)	16 (48.5%)
Not in relationship	104 (43%)	17 (51.5%)
Know someone who has had CC	29 (12%)	6 (18%)
Don't know someone who has had CC	174 (70%)	24 (71%)

3.4.4 Bivariate analysis

Bivariate analyses were conducted to establish relationships between independent and dependent variables. Means and standard deviations were calculated to identify the direction of relationships. As all variables met assumptions of normality, independent sample t-tests were calculated for categorical data, as shown in Table 5. When homogeneity of variance assumptions were violated, separate variance estimates were used. The only significant relationships were women in a relationship had significantly higher levels of intention ($t(241)=3.01$, $p<.01$) than those not in a

Table 5: Bivariate analyses with Categorical Data

	Intention				Attendance			
Demographic Variable	*M*	*SD*	Difference between variables *t*(df)	*p*	*M*	*SD*	Difference between variables *t*(df)	*p*
White British/Irish	9.42	4.27	*t*(244)=.74	.460	4.13	2.34	*t*(46.89)= -2.05	.046 *
Non White British/Irish	10.00	3.74			4.91	1.99		
In a relationship	10.21	4.04	*t*(241)=3.01	<.01 *	4.33	2.35	*t*(241)=.624	.530
Not in a relationship	8.59	4.29			4.14	2.27		
Education up to A levels	9.53	4.58	*t*(135)=.06	.954	4.62	2.19	*t*(243)=1.86	.064
Education Bachelors and above	9.49	4.04			4.03	2.34		
Born in the UK	9.40	4.26	*t*(26.73)=1.64	.112	4.18	2.31	*t*(245)=-1.29	.200
Not born in the UK	10.67	3.28			4.86	2.24		
Know someone with CC	9.77	4.20	*t*(216)=-.23	.817	4.52	2.31	*t*(216)=.969	.334
Don't know someone with CC	9.61	4.16			4.14	2.32		
Nature of abuse: rape	9.37	4.20	*t*(245)=-1.31	.191	4.23	2.30	*t*(242)=.543	.588
Type of abuse: not rape	10.37	4.12			4.47	2.37		

relationship, and non-White British/Irish had a significantly higher attendance rate ($t(46.89) = -2.05$, $p = .046$) compared to White British/Irish. Age of abuse included three groups so a one-way independent ANOVA was completed showing no significant difference between groups for intention ($F(2,235) = 1.174$, $p = .311$) or attendance ($F(2,237) = .40$, $p = .671$).

Pearson correlations were conducted between all continuous variables as parametric assumptions were met. Bivariate correlation coefficients, means and standard deviations can be found in Table 6. Two-tailed correlations were conducted due to a lack of directional hypotheses regarding these relationships. As only a small amount of missing data existed, imputation was not conducted (Tabachnick & Fidell, 2001). Pairwise deletion was chosen to allow for correlations to be conducted on available data and variables.

Age did not significantly relate to intention or attendance. Action planning was the only HAPA variable significantly related to age ($r(244) = .138$, $p = .030$) indicating older participants had higher levels of action planning. The HAPA variables (risk perception, positive outcome expectancy, negative outcome expectancy, task self-efficacy, maintenance self-efficacy, recovery self-efficacy, action planning and coping planning) were all highly positively correlated to each other, except for risk perception. Intention and attendance were both most highly positively correlated with task self-efficacy (intention: $r(245) = .804$, $p < .001$; attendance: $r = (245).681$, $p < .001$) and maintenance self-efficacy (intention: $r(243) = .809$, $p < .001$; attendance: $r(243) = .662$, $p < .001$). Intention and attendance were highly significantly correlated ($r(245) = .609$, $p < .001$) indicating higher levels of intention was associated with higher

levels of intention. The CCAM was only significantly related to positive outcome expectancy ($r(233)=.131$, $p=.043$) and task self-efficacy ($r(236)=.180$, $p=.005$). These were both positive relationships. Finally, the PCL-5 significantly related to all HAPA variables except for positive outcome expectancy. These relationships were all negative except for with risk perception, indicating higher levels of PTSD symptoms were related to lower levels of intention, attendance and all types of self-efficacy. This indicated HAPA variables strongly related to intention and attendance within women with a history of sexual assault, and levels of trauma symptoms related to intention and attendance.

Table 6: Correlation Matrix

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.
1. Intention													
2. Attendance	.609***												
3. Age	-.063	.146*											
4. Risk Perception	.137*	.034	-.001										
5. Positive Outcome Expectancy	.621***	.470***	-.044	.289***									
6. Negative Outcome Expectancy	.497***	.474***	-.038	-.127*	.280***								
7. Task Self-Efficacy	.804***	.681***	.006	.081	.617***	.510***							
8. Maintenance Self-Efficacy	.809***	.662***	-.037	.051	.577***	.600***	.841***						
9. Recovery Self-Efficacy	.618***	.380***	.014	.037	.364***	.334***	.544***	.623***					
10. Action Planning	.562***	.462***	.138*	.019	.317***	.291***	.530***	.479***	.451***				
11. Coping Planning	.625***	.516***	.075	.036	.395***	.604***	.637***	.701***	.526*	.501***			
12. Cervical Cancer Awareness	.114	.041	.018	.111	.131*	.023	.131*	.110	.100	.094	1.00		
13. PCL-5 Score	-.170**	-.177**	.031	.183**	-.041	-.433***	-.191**	-.246***	-.149*	-.233***	-.392***	-.052	
Mean	9.51	4.24	38.40	3.73	5.15	2.46	3.78	3.94	4.25	3.47	2.95	12.79	45.91
(SD)	(4.20)	(2.31)	(10.14)	(0.86)	(1.57)	(1.40)	(2.33)	(1.91)	(1.74)	(1.79)	(1.74)	(4.88)	(19.41)

Note. *p<.05; **p<.01; ***p<.001

3.4.5 Multivariate Analysis

Multivariate analyses were conducted to analyse the contribution and independent predictive abilities of HAPA variables to intention and attendance variance. Demographic variables and CCAM were excluded due to the lack of significant bivariate relationships. Multiple regressions were chosen to enable analysis of several predictors, and as both outcome variables were continuous (Field, 2005). Entering all HAPA variables into a multiple regression model was deemed appropriate due to the sample size meeting requirements to generate medium effect sizes (Miles & Shevlin, 2001). Missing data was again considered to be small (less than 5%) therefore listwise deletion was chosen as pairwise is not recommended for multiple regression (Meyers et al., 2016). This was deemed unlikely to impact power (Brockmeier, Kromrey, & Hogarty, 2003) or reliability (Little & Rubin, 2014).

3.4.6 Assumptions of Multiple Regression

Firstly, predictor variables were tested for independence as high correlations between variables can lead to an unreliable model (Field, 2005). Multicollinearity is considered likely when VIF values>10 (Belsley, Kuh, & Welsch, 1980; Mason & Perreault, 1991; Myers, 1990) as VIF<10 is considered as inconsequential collinearity (Hair, Anderson, Tatham, & Black, 1995). An average VIF close to 1 (Kennedy, 1992) and tolerance levels>0.10, when drawing on the above rule for VIFs (Menard, 1995) also indicate lack of multicollinearity. These were completed for each regression model (Appendix 12). Secondly, independent errors were confirmed through Durbin-Watson calculation and values between 1-3 were considered acceptable (Field, 2005). Thirdly, assumptions of normality were checked by visual examination of the histogram and P-Plots. Fourthly,

homoscedasticity assumptions were confirmed through visual examination of a scatter plot of standardised residuals verses standardised predicted values. Fifth, potential outliers were identified through standardised residuals, with values more than three indicating potential outliers (Field, 2005). Finally, to identify cases causing potential excess influence on the model, Cooks distance and DFBeta were calculated using the recommended upper limits of one (Field, 2005). Unless otherwise commented on, assumptions for regression were met for each model.

3.4.7 Mediation Analysis

Mediation analyses were conducted as exploratory analyses to increase understanding of relationships between variables (Preacher & Kelley, 2011). One mediation analysis was conducted for each hypothesis to control for type 1 errors. The significant relationships between variables identified in bivariate analyses meant recommended criteria were met (Baron & Kenny, 1986) and the large sample size allowed identification of potential mediation (MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002). A bootstrapping approach was employed to test the indirect effect, using a sample size of 1000 (Shrout & Bolger, 2002). Full mediation was considered as occurring when the relationship between the IV and DV became insignificant in the presence of the mediator (Baron & Kenny, 1986) and the coefficient approached zero (Fritz & MacKinnon, 2007).

3.4.8 Hypothesis 1: Intention variables (task self-efficacy, risk perception and outcome expectancies) will predict intention, over and above other variables

Intention was entered as the dependent variable, and all HAPA variables were entered as predictor variables (Appendix 13). The HAPA variables explained a significant amount

of the variance in intention (R^2= .760; adjusted R^2=.752; (F(8,239)=91.50, p<.001). Positive outcome expectancy (β=.148, p<.001), task self-efficacy (β=.303, p<.001), maintenance self-efficacy (β=.294, p<.001), recovery self-efficacy (β=.143, p<.001) and action planning (β=.116, p=.004) were all significant predictors. This shows the HAPA variables were significantly able to predict intention.

Hypothesis 1 was tested using a hierarchical regression (Table 7). Attendance variables were entered into Step 1; intention variables into Step 2; and intention was the outcome variable. Attendance variables explained a significant amount of the variance in intention (R^2 =.705; adjusted R^2 =.700; F(4,239)=140.14, p<.001) and intention variables contributed a significant increase in the amount of variance explained from 71% to 76% (R^2 = .760; adjusted R^2 =.752; F(8,239)=91.50, p<.001). Model 2 identified task self-efficacy (β=.303, p<.001), maintenance self-efficacy (β=.294, p<.001), positive outcome expectancy (β=.148 p<.001), recovery self-efficacy (β=.143, p=.001) and action planning (β=.116, p=.004) as independent significant predictors. This supported the hypothesis that intention variables would predict intention, above and beyond other HAPA variables.

Table 7: Hierarchical Regression with intention as outcome variable, attendance variables entered at Step 1, and intention variables entered at Step 2

	B	SE *β*	*β*
Step 1			
(Constant)	1.211	.419	
Maintenance Self-Efficacy	1.357	120	.623***
Recovery Self-Efficacy	.321	.111	.135***
Action Planning	.396	.100	.169**
Coping Planning	.091	.125	.038
Step 2			
(Constant)	-.426	.777	
Maintenance Self-Efficacy	.640	.156	.294***
Recovery Self-Efficacy	.342	.102	.143***
Action Planning	.273	.094	.116**
Coping Planning	.054	.121	.022
Risk Perception	.034	.171	.034
Positive Outcome Expectancy	.392	.116	.148***
Negative Outcome Expectancy	.098	.131	.033
Task Self-Efficacy	.542	.115	.303***

Note. *p<.05; **p<.01; ***p<.001

3.4.9 Exploratory Analysis: Task self-efficacy will mediate the relationship between HAPA variables and intention

As outcome expectancy significantly predicted intention (β=.621, p<.001) and task self-efficacy (β=.617, p<.001), and task self-efficacy significantly predicted intention (β=.804, p<.001) a mediation analysis was conducted. The model explained a significant 68% of the variance (R^2= .683; adjusted R^2=.680; F(2,243=259.43 p<.001). As both positive outcome expectancy (β=.195, p<.001) and task self-efficacy (β=.692, p<.001)

maintained significance, this indicated task self-efficacy partially mediated the relationship between positive outcome expectancy and intention, as show in Figure 3. A Sobel test and bootstrapping indicated the partial mediation was significant (z= 3.98, p<.001; 95%CI .086-.357).

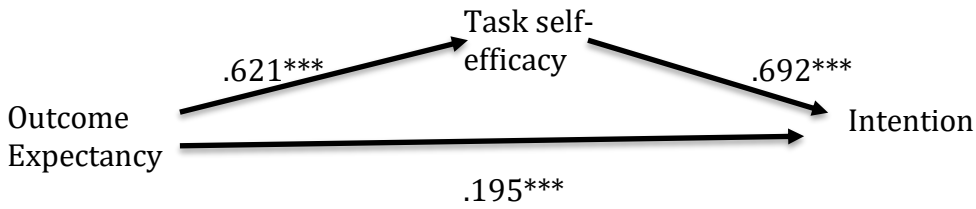

Figure 3: Mediation of task self-efficacy on relationship between outcome expectancy and intention

Note. *p<.05; **p<.01; ***p<.001

3.4.10 Hypothesis 2: Attendance variables (maintenance and recovery self-efficacy, action and coping planning) will predict attendance, over and above other variables

An initial multiple regression model was conducted with all HAPA variables entered as predictor variables and attendance as the outcome variable (Appendix 14). The variables accounted for a significant percentage (51%) of the model (R^2 = .513; adjusted R^2 = .494; F(9,239)=26.97, p<.001). Task self-efficacy (β=.287, p=.001), maintenance self-efficacy (β=.278, p=.009) and action planning (β=.149, p=.011) all significantly independently contributed. This showed the HAPA model significantly predicted attendance.

To test the additional contribution of attendance variables to the model, a hierarchical regression model was conducted with intention variables entered as Step 1, attendance

Table 8: Hierarchical regression model with attendance as outcome variable, intention variables entered at Step 1 and attendance variables entered at Step 2

	B	SE *β*	*β*
Step 1			
(Constant)	.955	.583	
Intention	.076	.047	.138
Positive Outcome Expectancy	.115	.095	.078
Negative Outcome Expectancy	.254	.093	.154**
Task Self-Efficacy	.430	.084	.435***
Risk Perception	-.078	.137	-.029
Step 2			
(Constant)	.799	.613	
Intention	.031	.052	.056
Positive Outcome Expectancy	.106	.093	.072
Negative Outcome Expectancy	.179	.103	.109
Task Self-Efficacy	.284	.095	.287**
Risk Perception	-.057	.135	-.021
Maintenance Self-Efficacy	.335	.127	.278**
Recovery Self-Efficacy	-.153	.082	-.116
Action Planning	.194	.075	.149*
Coping Planning	-.017	.095	-.013

Note. *p<.05; **p<.01; ***p<.001

variables at Step 2, and attendance as the outcome variable (Table 8). The variables explained a significant amount of the variance in Model 1 (R^2 = .485; adjusted R^2 = .474; F(5,239)=44.00, p<.001). The addition of attendance variables explained a significant increase in the variance of attendance (R^2 = .513; adjusted R^2 = .494; F(9,239)=26.97, p<.001), with an increase from 49% to 51%. Independent significant predictors were task

self efficacy (β=.287, p=.003), maintenance self-efficacy (β=.278, p=.009), and action planning (β=.149, p=.011). This supports hypothesis 2, showing that the addition of attendance variables significantly contribute to the variance in attendance.

3.4.11 Exploratory Analysis: Maintenance self-efficacy will mediate the relationship between HAPA variables and attendance

The significant predictive power of action planning on maintenance self-efficacy (β=.479, p<.001) and attendance (β=.462, p<.001), and maintenance self-efficacy on attendance (β=.662, p<.001) indicated appropriateness of mediation analysis. The model was significant (R^2= .459; adjusted R^2=.454; (F(2,243=102.193 p<.001) and both action planning (β=.178, p=.001) and maintenance self-efficacy (β=.574, p<.001) remained significant. This indicates partial mediation occurred (Figure 4). A Sobel test and bootstrapping indicated the partial mediation of maintenance self-efficacy on the relationship between action planning and attendance, was significant (z= 4,123, p<.001; 95%CI .091-.243).

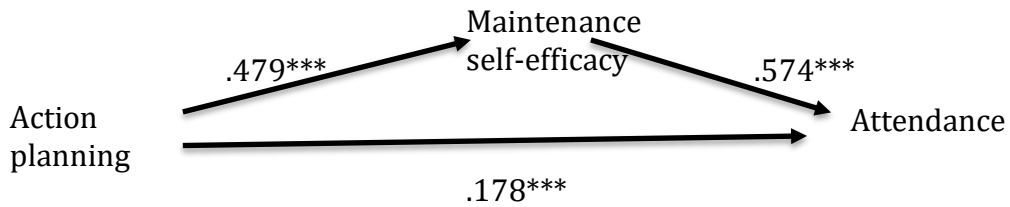

Figure 4: Mediation of maintenance self-efficacy on relationship between action planning and attendance

Note. *p<.05; **p<.01; ***p<.001

3.4.12 Trauma related bivariate analysis

Within the sample, 86% of participants reported experiencing rape, 13% reported not and 1% did not answer. For age of abuse, 23% reported experiencing sexual assault in childhood, 22% reported experiences in adulthood and 52% reported both childhood and adulthood trauma (3% did not answer). The majority of women reported symptoms over the cut off of the PCL-5 of 33 (71%). Women who had experienced rape had significantly higher levels of trauma than individuals who did not experience rape ($t(229)=4.063$, $p<.001$). No significant difference was found between age abuse occurred and level of PCL-5 score ($F(2,230)=1.479$, $p=.230$).

3.4.13 Hypothesis 3a: Trauma-related variables (age, nature and PTSD symptoms) will explain intention over and above other HAPA variables

To analyse the predictive abilities of trauma variables, a multiple regression was calculated with PCL-5 and nature of abuse as predictor variables, and intention as the outcome variable (Appendix 15). The model explained a significant amount of the variance ($R^2 = .029$; adjusted $R^2 = .020$; $F(2,230)=3.41$, $p=.035$) with PCL-5 score as the only independent significant predictor ($\beta=-.165$, $p=.015$). A second multiple regression (Appendix 16) was run with PCL-5 and age of abuse as predictor variables, and intention as the outcome variable. Again, the model explained a significant amount of the variance ($R^2=.034$; adjusted $R^2=.022$; $F(3,230)=2.70$, $p=.046$) with PCL-5 score as the independent significant predictor ($\beta=-.163$, $p=.014$).

Due to neither SPAQ groupings being independent predictors, only PCL-5 score was entered into the hierarchical regression (Table 9). Intention variables were entered

Table 9: Hierarchical regression with intention as the outcome variable, intention variables in Step 1 and PCL-5 score in Step 2

	B	SE *β*	*β*
Step 1			
(Constant)	1.366	.848	
Risk Perception	.116	.201	.024
Positive Outcome Expectancy	.496	.135	.185***
Negative Outcome Expectancy	.382	.134	.127**
Task Self-Efficacy	1.126	.096	.627***
Step 2			
(Constant)	1.512	.964	
Risk Perception	.123	.202	.025
Positive Outcome Expectancy	.498	.§36	.186***
Negative Outcome Expectancy	.365	.145	.121*
Task Self-Efficacy	1.125	.096	.626***
PCL-5	-.003	.009	-.014

Note. *p<.05; **p<.01; ***p<.001

into the model in Step 1, PCL-5 score entered in Step 2 and intention as the predictor variable. This was to determine whether PCL-5 score predicted variance in intention, once the HAPA variables were accounted for. The addition of PCL-5 did not increase the amount of variance explained (Model 1 R^2 = .682; Model 2 R^2 = .682), however the final model did explain a significant amount of the variance in intention (R^2 = .682; adjusted R^2 = .675; F(5,225)=94.58, p<.001). PCL-5 was not a significant predictor in Model 2, indicating hypothesis 3 was not supported.

3.4.14 Hypothesis 3b: Trauma-related variables (age, nature and trauma symptoms) will explain attendance over and above other HAPA variables

The analyses for hypothesis 3a were repeated with attendance as an outcome variable to explore whether the addition of trauma variables explained significantly more of the variance in attendance. A multiple regression with nature of trauma and PCL-5 score entered as predictor variables and attendance as the outcome measure (Appendix 17). The model explained a significant amount of the variance (R^2 = .031; adjusted R^2 = .023; $F(2,230)=3.67$, $p=.027$), however only PCL-5 was a significant independent predictor ($\beta=-.178$, $p=.009$). A second multiple regression was completed with age of trauma and PCL-5 as predictor variables and attendance as the dependent variable (Appendix 18). Similarly, this model was significant (R^2 = .037; adjusted R^2 = .024; $F(3,230)=2.91$, $p=.036$), however only PCL-5 was a significant independent predictor ($\beta=-.185$, $p=.005$). This indicates PCL-5 score significantly predicts lower attendance levels.

As neither SPAQ categorical variables were independent predictors of attendance, only PCL-5 score was entered into the hierarchical regression model (Table 10). To test whether PCL-5 could predict an additional amount of the variance, attendance variables were entered at Step 1, PCL-5 score at Step 2 and attendance was the predictor variable. The inclusion of PCL-5 did not explain additional variance in attendance (47.3% to 47.4%) however the final model was highly significant (R^2 = .474; adjusted R^2 = .462; $F(5,227)=39.97$, $p<.001$). Maintenance self-efficacy ($\beta=.610$, $p<.001$), and action planning ($\beta=.195$ $p=.001$) were the only independent significant predictors. This indicates that the addition of trauma symptoms does not increase the amount of variance explained for attendance, over and above HAPA variables.

Table 10: Hierarchical regression with attendance as outcome variable, attendance variables entered in Step 1 and PCL-5 score entered in Step 2

	B	SE *β*	*β*
Step 1			
(Constant)	1.006	.314	
Maintenance Self-Efficacy	.735	.091	.610***
Recovery Self-Efficacy	.-.159	.084	-.121
Action Planning	.247	.074	.193***
Coping Planning	.068	.093	.051
Step 2			
(Constant)	.803	.476	
Maintenance Self-Efficacy	.734	.091	.610***
Recovery Self-Efficacy	-.162	.084	-.124
Action Planning	.250	.075	.195***
Coping Planning	.084	.098	.064
PCL-5	.004	.006	.030

Note. *p<.05; **p<.01; ***p<.001

3.4.15 Exploratory Analysis: Self-efficacy will mediate the relationship between trauma symptoms, and intention and attendance

Initial analysis highlighted PCL-5 score as a significant predictor of intention (β=-.170, p=.010) and task self-efficacy (β=-.191, p=.004), and task self-efficacy as a significant predictor of intention (β=-.804, p<.001). Regression to explore mediation found PCL-5

score was no longer a significant predictor of intention (β=-.018, p=.663) however the model was significant (R^2= .636; adjusted R^2=.633; (F(2,230)=199.06, p<.001). A Sobel test and bootstrapping indicated full mediation was significant (z= -2.91, p=.004; 95%CI -.055-.-012).This indicates task self-efficacy fully mediated the relationship between PCL-5 and intention (Figure 5).

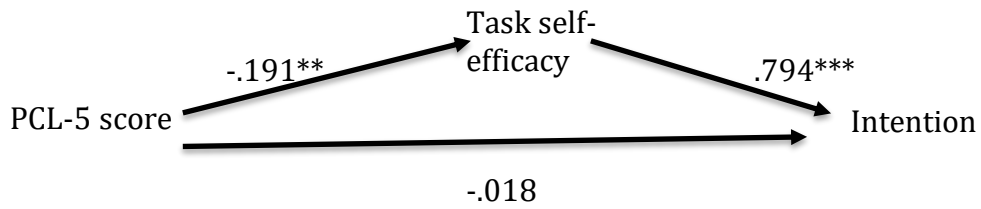

Figure 5: Mediation of task self-efficacy on relationship between PCL-5 score and intention

Note. *p<.05; **p<.01; ***p<.001

Mediation using regression analysis was used to investigate the hypothesis that maintenance self-efficacy mediates the relationship between PCL-5 score and attendance. As PCL-5 score was a significant predictor of attendance (β=-.177, p<.001) and maintenance self-efficacy (β=-.246, p<.001), and maintenance self-efficacy was a significant predictor of attendance (β=.662, p<.001), this supported the hypothesis that mediation was occurring. After controlling for maintenance self-efficacy, PCL-5 was no longer a significant predictor (β=-.010, p=.840). The model (Figure 6) was significant and accounted for 44% of the variance in attendance (R^2= .442; adjusted R^2=.437; (F(2,228)=89.56, p<.001). A Sobel test and bootstrapping indicated full mediation of maintenance self-efficacy on the relationship between PCL-5 score and attendance was significant (z= -3.66, p=.0003; 95%CI -.031-.-009).

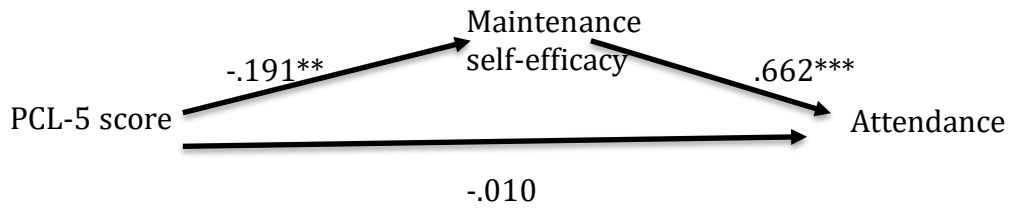

Figure 6: Mediation of maintenance self-efficacy on relationship between PCL-5 score and attendance

Note. *p<.05; **p<.01; ***p<.001

3.4.16 Exploratory Analysis: Action and coping planning will mediate the relationship between intention and attendance

Intention significantly predicted attendance (β=.609, p=.001), action planning (β=.562, p<.001) and coping planning (β=.625, p<.001). As both action planning (β=.462 p<.001) and coping planning (β=.516, p<.001) predicted attendance, a regression mediation analysis was conducted. The model explained a significant amount of the variance (R^2= .407; adjusted R^2=.399; (F(3,244=55.01, p<.001), and all three predictor variables of intention (β=.413, p<.001) , action planning (β=.132, p=.033) and coping planning (β=.188, p=.004) remained significant. A Sobel test and bootstrapping indicated partial mediation was significant for both action planning (z= 2.09, p=.036; 95%CI .005-.084) and coping planning (z= 2.80, p=.005; 95%CI .018-.113). This indicates that partial mediation occurred by action and coping planning, within the relationship between intention and attendance (Figure 7).

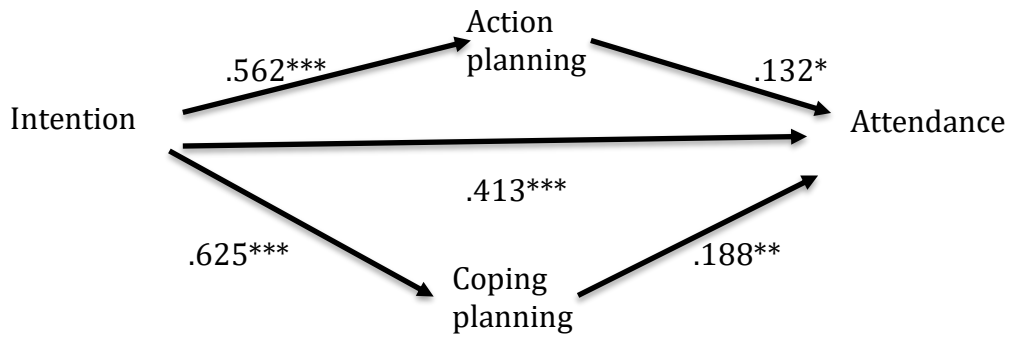

Figure 7: Mediation of action and coping planning on relationship between intention and attendance

Note. *p<.05; **p<.01; ***p<.001

3.5 Discussion

3.5.1 Summary of Findings

The study aimed to understand more about factors related to CS intention and attendance amongst women who have experienced sexual assault. The aim was to understand how trauma is related to CS uptake and identify ways to improve ongoing CS attendance in women with a history of sexual assault. The main findings indicated that HAPA variables significantly predicted both intention and attendance of CS in women with a history of sexual assault. Secondly, although trauma variables independently predicted both intention and attendance, these relationships did not remain significant once HAPA variables were included. Exploratory analyses found that self-efficacy fully mediated the relationship between trauma symptoms and attendance/intention to attend CS. This highlights the importance of self-efficacy in understanding CS uptake within women who have experienced sexual assault.

The exploratory analysis indicated that, contradictory to previous findings, overall, demographic variables did not predict intention or attendance (Fylan, 1998; Jo's Cervical Cancer Trust, 2017; Sutton & Rutherford, 2005). It is therefore possible that for women who have experienced sexual assault, psychological variables are more important in predicting CS uptake. However, Non-White British/Irish had a significantly higher level of attendance than White British-Irish, contrary to previous research (Waller et al., 2009). In this sample, White British/Irish reported almost significantly higher (p=.053) levels of trauma symptoms than Non-White British/Irish. As trauma symptoms negatively related to attendance, this could have moderated the relationship between that and ethnicity, thereby explaining these findings. Consistent with previous research, women in a

relationship reported higher intention to attend CS (Sutton & Rutherford, 2005), supporting the robustness of this relationship across participant groups (Orbell, Crombie, & Johnston, 1996). Combined, these findings suggest psychological variables are more important in explaining CS uptake for women who have experienced sexual assault, and could indicate a potential consistent impact of sexual trauma on CS uptake across demographics.

In addition, knowledge of CC and CS did not relate to intention or attendance contrary to previous research in general populations (Hansen et al., 2011; Walsh, 2006). This may further highlight the role of self-efficacy, indicating it is more about women's belief in their abilities, and support the reduced significance of risk perception within this population.

3.5.1.1 Hypothesis 1: Intention variables (task self-efficacy, risk perception and outcome expectancies) will predict intention, over and above other variables

Hypothesis 1 was supported as intention variables significantly predicted intention in women with a history of sexual assault, after other HAPA variables were accounted for. The large proportion of the variance explained (76%) highlights the importance of these variables for understanding intention within this population. The substantial predictive ability of task self-efficacy and positive outcome expectancy supports previous research (Tang & Mek, 2011) and is consistent with HAPA theory (Schwarzer, 2008). It can therefore be concluded that women are more likely to endeavor to attend their CS when they endorse more benefits and have more belief in their abilities to complete the CS. The fact that risk perception was not an independent predictor is consistent with findings

for engagement with breast self-examination (Luszczynska & Schwarzer, 2003) and suggests this should not be the focus for interventions. This could be due to women's outcome expectancies being well established (Schwarzer et al., 2003). This is in line with ideas that risk perception is insufficient for predicting intention (Schwarzer, 2008) particularly once outcome expectancies are accounted for (Schwarzer et al., 2003). This demonstrates a potential over-focus on risk perception in previous health behaviour research (Schwarzer & Fuchs, 1996). Contrary to previous research showing embarrassment as a barrier to CS uptake, negative outcome expectancies were a non-significant predictor (Murray & McMillan, 1993). The lower mean level of negative outcome expectancy, could explain this by indicating endorsement by most participants, similar to previous research (Orbell & Sheeran, 1998).

To gain a more detailed understanding of the relationship between HAPA variables and intention, mediation analyses were calculated. Task self-efficacy partially mediated the relationship between positive outcome expectancy and intention. This indicates that the belief CS has beneficial outcomes relates to a higher level of desire to attend, even more so if women believe they can successfully complete the CS. It is therefore possible that outcome expectancies are precursors to self-efficacy as individuals tend to evaluate behaviours prior to considering their abilities to engage in it (Schwarzer & Fuchs, 1996). Consistent with the HAPA theory, this suggests self-efficacy is both the primary influential predictor of intention in women who have experienced sexual assault and a dominant predictor of behaviour (Bandura, 1997; Schwarzer et al., 2003).

3.5.1.2 Hypothesis 2: Attendance variables (maintenance and recovery self-efficacy, action and coping planning) will predict attendance, over and above other variables

Hypothesis 2 was also supported as, consistent with HAPA literature (Schwarzer, 2008), attendance variables predicted a significant amount more of the variance in attendance when other HAPA variables were accounted for. The most significant predictors were maintenance self-efficacy, action planning and task self-efficacy. Maintenance self-efficacy, whereby women believe they can attend despite barriers, is particularly important in this client group due to the scope of barriers identified in previous research (Cadman et al., 2012; Robohm & Buttenheim, 1996).

Interestingly, recovery self-efficacy did not independently predict attendance, despite strongly relating to both intention and attendance in bivariate analysis. The strongly significant relationships between task, maintenance and recovery self-efficacy, could imply these constructs were not conceptually distinct enough to be separate contributors to variance. Alternatively, this may be due to the likely attendance histories within this group. Recovery self-efficacy describes a woman's belief in her ability to attend her CS after cancelling or not-attending. Therefore it is highest in individuals who have experienced a lapse, as this proves their ability to resume the behavior (Luszczynska, Mazurkiewicz, Ziegelmann, & Schwarzer, 2007). Within this group, women may have attended their CS prior to their assault, therefore have higher attendance rates, but not feel able to continue with attendance, leading to low recovery self-efficacy. This would have reduced its predictive ability, due to an inconsistent relationship with attendance within the sample. This idea is further supported by the higher mean level of maintenance self-efficacy, which suggests participants were less likely to have experienced multiple

lapses, as lapses reduce women's belief in their ability to persist (Luszczynska et al., 2007). As such, women in this study may have had fewer opportunities to experience recovery self-efficacy, due to their limited experiences with lapses. This would have reduced its power through lower self-report levels. It can therefore be tentatively concluded that the impact of trauma on attendance, may explain the diminished role of recovery self-efficacy in understanding CS attendance within this group. These results suggest improving recovery self-efficacy is unlikely to improve CS attendance.

Another inconsistency with previous HAPA literature, was the lack of predictive power of coping planning. Previous research has collapsed action and coping planning (Teng & Mak, 2011) therefore it is possible that the variance explained by coping planning was accounted for by action planning due to construct overlap. However, coping planning requires the ability to mentally stimulate potential barriers to attendance and execute a behavioural response to ensure completion of the desired behaviour (Scholz, Schüz, Ziegelmann, Lippke, & Schwarzer, 2008). In this study, participants were asked if they felt able to cope if they experienced reminders of their trauma. However mental simulation, relying on individuals to consider barriers, is inconsistent with trauma symptoms, where individuals may avoid mental reminders of the event. The findings here therefore may suggest that an interaction with trauma symptoms reduced the predictive power of coping planning.

Maintenance self-efficacy partially mediated the role between action planning and attendance. This indicates that translating plans to attend into actual attendance is more likely when women hold a high level of self-belief they can persevere with attendance when confronted with barriers. Interestingly, Schwarzer and Fuchs (1996) suggested self-

efficacy may influence action planning by increasing the quality of plans (Schwarzer et al., 2003). Further work is therefore needed to explore this potential bi-directional relationship.

3.5.1.3 Hypothesis 1 and 2

The findings related to hypothesis 1 and 2 both demonstrate that the HAPA model significantly explains intention and attendance to CS among women with a history of sexual assault and support the differentiation between intention and attendance. One interesting finding was the role of maintenance self-efficacy in predicting intention and task self-efficacy in predicting attendance, which is less aligned with HAPA literature. Schwarzer (1992) suggests different types of self-efficacy are required for different tasks depending on the stage of behavior change; however the findings here could argue that both task and maintenance self-efficacy are required for intention and attendance. The three to five year gap between CS maybe a reason that maintenance self-efficacy was a strong predictor of both intention and attendance, as time lapses require higher levels of maintenance self-efficacy (Luszczynska, et al., 2007). The role of task self-efficacy on attendance maybe due to its positive impact on goal setting (Schwarzer et al., 2003). Overall this demonstrates the importance of self-efficacy in novel and difficult situations (Schwarzer, 1992) and highlights task and maintenance self-efficacy as key factors to increase CS uptake in women who have experienced sexual assault.

3.5.1.4 Hypothesis 3a and b: Trauma-related variables (age, nature and PSTD symptoms) will explain intention and attendance over and above other HAPA variables

Consistent with previous research, this study found high levels of trauma symptoms among participants which, through the role of avoidance, could explain the low

attendance rates (mean attendance = 60%) (Amstadter & Vernon, 2008; Cadman et al., 2012). Contrary to previous findings, neither age nor the nature of assault were significant predictors of intention or attendance (Farley et al., 2002). This supports theories that highlight the role of individualistic thoughts, processes and emotions (Nijdam & Wittmann, 2015), and the influence of psychosocial factors on the impact of the trauma (Benight & Bandura, 2004), rather those highlighting the nature of the trauma (Kendall-Tackett et al., 1993). However, the high proportion of participants who reported experiences of sexual assault including rape (86%), could have affected the statistical power of these calculations.

Hypothesis 3 was not supported as the addition of trauma variables did not explain more of the variance in intention or attendance once HAPA variables were controlled for. Furthermore, PCL-5 became a non-significant predictor. This tentatively suggests HAPA variables are stronger predictors of CS uptake, possibly due to the effect of self-efficacy on trauma symptoms and its significant role within the HAPA. This explanation is supported as high self-efficacy relates to lower PTSD and perceived control over recovery (Benight & Midboe, 2002; Ullman, Filipas, Townsend & Starynski, 2007) and low coping self-efficacy predicts higher PTSD symptoms (Benight et al., 1999). This association may be due to women who experience sexual assault developing an internal cognitive model that the world is dangerous (Briere & Elliot, 1994). This may lead them to underestimate their ability to manage perceived perilous experiences, such as CS, and in turn, reduce their self-reported levels of self-efficacy.

3.5.1.5 Trauma mediation

The fact that self-efficacy fully mediated the relationships between trauma symptoms and intention and attendance suggests trauma symptoms relate to intention and attendance predominantly due to women's self-beliefs. This could imply women can experience PTSD symptoms and still attend their CS, as long as they believe in their ability to successfully complete it, even if faced with challenges. The direction of this relationship is unclear as trauma symptoms may reduce self-efficacy, through symptoms such as helplessness, negative beliefs and self-blame (Weathers et al., 2013). Furthermore, self-efficacy has been suggested to maintain PTSD (Benight & Bandura, 2004) and can predict recovery from trauma (Benight & Harper, 2002). Finally, self-efficacy has previously been applied in the understanding of how trauma symptoms develops, due to childhood trauma restricting the development of self-efficacy through impacting on their ability to cope (Diehl & Prout, 2002) or through the mechanism of negative cognitions (Cieslak, Benight & Lehman, 2009). Despite uncertainty in the direction of the relationship, a clear association between self-efficacy and trauma symptoms indicates the importance of self-efficacy in understanding the impact of sexual assault, thereby highlighting its role in improving CS uptake.

3.5.1.6 Exploratory Analysis: Action and coping planning will mediate the relationship between and intention and attendance

Action and coping planning contributed to the relationship between intention and attendance; however the continued direct relationship between the two highlights the importance of understanding intention. This contributes to the intention-behaviour gap debate. It suggests that in this case intention does explain some level of attendance, albeit strengthened by consideration of planning. This extends previous theories that behaviour

is best predicted by intention (Fishbein & Azjen, 1975), but supports the notion that intention is not sufficient at fully explaining behaviour (Schwarzer & Fuchs, 1996). Furthermore, it supports research showing that behaviour is more likely when intentions are combined with planning (Gollwitzer & Sheeran, 2006). Interestingly, this also links with trauma research, which highlights the need to consider planning abilities for individuals with poor self-regulation (Schwarzer & Luszczynska, 2008), which is often impacted by trauma (Van de Kolk, 1996). The reduced sense of safety associated with trauma can weaken optimistic self-beliefs, which help individuals become aware of available resources, and are a necessary component of planning (Schwarzer, Luszczynska, Ziegelmann, Scholz, & Lippke, 2008).

3.5.2 Clinical Implications

Only 35% of participants had attended 100% of their CS, and the average attendance rate was 60%. This supports previous research showing lower attendance rates among women with a history of sexual assault (Cadman et al., 2012). This low attendance is particularly concerning as self-report CS attendance is normally over-reported (Bowman, Sanson-Fisher, & Redman, 1997). The lack of significant findings involving demographic factors further adds to the suggested need to focus on psychological variables. Interventions focusing on HAPA variables to increase CS uptake for women with a history of sexual assault are likely to be beneficial due to its highly predictive ability. These findings suggest that focusing purely on reducing trauma symptoms may be less effective than helping to increase a woman's self-efficacy, at improving CS uptake. As such, emphasis on helping women to cope with managing trauma symptoms through skill building and skill training may be more beneficial (Cieslak et al., 2008).

Identifying women's level of intention and past attendance will help in supporting women most effectively (see Figure 2). For women with low levels of intention, task self-efficacy and positive outcome expectancies should be considered. Ideas for interventions for self-efficacy can be drawn from: Bandura's theory (1997) focusing on recalling mastery experiences, persuasion and modelling may also both increase self-efficacy; the expectancy-value theory, focusing on increasing women's value on the positive outcome of CS (Atkinson, 1964); and ideas around vicarious experiences potentially through social support and reduction in perceptions of task difficulty (Schunk, 1990). For example, sharing stories about women who have experienced sexual assault and have successfully attended their CS after experiencing barriers could be beneficial. The idea of verbal persuasion relates to findings by Jo's Cervical Cancer Trust (2017) that reassurance from friends would encourage attendance. In addition, identifying personal benefits as to why CS is important for the individual, rather than focusing on potential negative outcomes would be helpful.

For women who intend to go but are struggling to consistently attend, it would be beneficial to help identify ways women feel able to manage potential barriers to continued attendance. Healthcare professionals can help to increase action and coping planning for these individuals by encouraging women to book an appointment saying when, where and how they will attend their CS, and helping them to plan for potential barriers. This would include identifying available coping strategies. Furthermore, facilitating opportunities for achievement and a sense of control could also be beneficial to increase desire to persist. Finally, considering self-efficacy more generally may be beneficial for clinicians working with women who have experienced sexual assault, especially if they are experiencing PTSD symptoms.

3.5.3 Theoretical implications

This provides support for the emphasis on self-efficacy included in the HAPA model and other health behaviour models, and adds to our understanding of the relationship between intention and attendance, and the intention-behaviour gap (Sheeran, 2002). The study supports criticisms of social-cognitive models, which fail to distinguish between different levels of intention and attendance (Bish et al., 2000). The HAPA aims to increase understanding of how intentions develop into attendance (Teng & Mak, 2011) and this was achieved in this study. This also adds to the utility of the HAPA model and the role of intention and attendance related behaviours in CS among women with a history of sexual assault. Although previously focused around a more general population, the explanatory benefits of the HAPA are further emphasised when compared to previous literature around the Theory of Planned Behaviour and Health Belief Model (Bish et al., 2000).

3.5.4 Strengths and limitations

To the author's knowledge, this research the first theory-driven study helping to understand CS uptake in women with a history of sexual assault.

3.5.4.1 Sample

The large sample size enabled analyses to meet power and effect sizes to be identified. The lack of difference found between completers and non-completers indicates a highly representative sample, particularly due to the sample size. However, the potential influence of self-selection bias should be considered. Self-efficacy can influence willingness to self-select to participate in research due to its influence on motivation (Schunk, 1990) and non-responders may have poorer psychological health (Almeida, Kashdan, Nunes, Coelho, Albino-Teixeira, & Soares-da-Silva, 2008), both of which may

have threatened the external validity of the findings. Although participants were generally highly educated, this is consistent with research identifying students to be more at risk of experiencing sexual assault (Office of National Statistics, 2018a). However, the 'digital divide' where individuals with higher levels of education are associated with higher levels of internet use (Rhodes, Bowie & Hergenrather, 2003) combined with the use of an online platform maybe a barrier to individuals with lower literacy levels. The low dropout rate once participants had commenced the study further adds to the reliability of the results. Finally, the opportunity sample is in line with much of the previous research, as identified in the systematic review, therefore maintains similar limitations.

One limitation is that participants were not asked if they had engaged in psychological therapy. This is important as CBT can reduce symptoms of PTSD (Butler, Chapman, Forman, & Beck, 2006) and in turn, as suggested in this study, impact on their levels of self-efficacy. Furthermore, feedback from charities and support groups advertising the study also highlighted that individuals may have received counseling, which may have improved their self-perception and altered their scores of self-efficacy. Future research considering the potential confounding role of whether an individual has received psychological support would therefore be helpful to confirm its role as a potential confounding variable.

Consideration should be made regarding the ethical implications of the sample size, as participants were recruited above that recommended by the a priori power calculations. The study was advertised to complete at the end of February 2018 and participants had the opportunity to return to complete their questionnaire once started. As such, it was

considered appropriate to continue with the original end date for recruitment as participants were not subjected to unnecessary treatment and participation in research has been identified to help their own recovery (Campbell & Adams, 2009). Combined with the possibility to detect more subtle findings, this was considered more advantageous than ending the study early.

3.5.4.2 Design

The self-report nature of the study may mean answers were influenced by interpretation differences and social-desirability bias. Although validity of results may have been diminished due to the online nature of the study, online recruitment has been found to be the most confidential means of assessing maltreatment history (DiLillo, DeGue, Kras, Di Loreto-Colgan, & Nash, 2006) and participant disclosure is higher when not face-to-face (Tourangeau & Yan, 2007). The anonymity was also thought to reduce social desirability bias, which could have been elicited by CS attendance questions, and can affect self-report responses (Huang, Liao, & Chang, 1998). The online nature also reduced geographical and cultural barriers, and enabled recruiting less-accessible populations (Rhodes et al., 2003). Consideration should be made, however, to the measure of self-report for attendance, meaning verification through records could not be conducted. However, the use of three separate measures to increase reliability aimed to compensate for this. Regarding other measures, the use of multiple items and the high levels of internal consistency increases the reliability of the constructs measured, thereby increasing confidence in the interpretation of results. The cross-sectional nature of the study limits the ability to infer causality.

The HAPA was selected due to its ability to be adapted to address population-specific barriers, its ability to understand the relationship between intention and attendance and its emphasis on self-efficacy. However, one limitation is the lack of emphasis on external motivators. The Self-Determination Theory (SDT) for example, acknowledges the role of social support through emphasizing the social context of the behaviour (Patrick & Williams, 2012), therefore allowing for the understanding of external motivators to a greater extent than the HAPA. Furthermore, although the findings of this thesis can be used to inform therapeutic interventions, models such as the SDT would have enabled a clear intervention development due to the relationship to motivational interviewing (Patrick & Williams, 2012). Finally, the emphasis in the SDT on the importance of people's psychological needs being met to influence health behaviours (Ryan, Patrick, Deci & Williams, 2008) could be advantageous to this client group.

The HAPA measure was specifically designed for this study, which ensured suitability of the items. Gaining feedback through service-user consultation confirmed that questions were appropriate to the population group and ensured face validity. Using previously employed questions also increased the reliability. However, some constructs included only two items which potentially reduced the internal consistency of the measure, although exploratory analysis indicated high levels of internal consistency. Furthermore, content validity was not checked by experts in the field, as has been done in previous research (Rohani, Eslami, & Ghaderi, 2016). The lack of predictive power of both coping planning and recovery self-efficacy could indicate high levels of overlap between the constructs. Reliability scales indicated a generally high level of reliability, however, test re-test reliability could not be measured and confirmatory factor analysis could not be conducted within the scope of this thesis.

Due to the inability of the first 80 participants to select experiences within the SPAQ occurring in both childhood and adulthood, categories for the age abuse occurred should be interpreted with caution for the first 80 participants. The original SPAQ was altered to reflect service-user feedback, therefore this should be considered when interpreting these findings. Although condensing age groups may have reduced the identification of a potential impact of age, the majority of women (over 50%) stated they had experienced sexual assault in childhood and adulthood experiences, therefore this is less likely.

Significant mediation was found despite the use of the Baron and Kenny model of mediation, which has been suggested to be a less statistically powerful approach. However, use of the PROCESS approach as an alternative mediation analysis would have minimised power reduction due to the approach's lack of assumptions (MacKinnon, Fairchild & Fritz, 2007).

3.5.5 Future directions

Due to the cross-sectional nature of the study, it is not possible to establish causality between PCL-5 scores and self-efficacy. It therefore could not be established whether trauma symptoms are more likely in women who have premorbid low levels of self-efficacy, or whether trauma negatively impacts women's self-efficacy. This is important as self-efficacy facilitates coping in stressful situations (Benight & Bandura, 2004), therefore further research would be beneficial to inform interventions. The model explained high amounts of variance but not 100%, therefore research focusing on the role of psychological variables could add to the understanding. The trialing of a psychological

intervention assessing the role of self-efficacy would allow for the proposed clinical implications of the findings of this study to be tested.

Although not a hypothesis-driven aspect of the study, the high levels of internal consistency within the HAPA model suggests the HAPA inventory used in this study furthers our understanding of CS uptake in women with a history of sexual assault. Further research testing the reliability would be beneficial to confirm this. The strong relationships between self-efficacy variables indicates a need for confirmatory factor analysis to allow for exploration of measurement invariance, which was beyond the scope of this thesis.

4 Integration, Impact and Dissemination

4.1 Integration

This thesis aimed to understand cervical smear (CS) uptake, through identifying factors related to intention and attendance in general populations, and those within women with a history of sexual assault. The aim was to explore the extent of similarities and difference in barriers and facilitators to CS uptake between the two populations, to identify whether population-specific guidelines targeting low attendance is most appropriate.

4.1.1 Integration of the findings of the systematic review (SR) and empirical paper (EP)

The whole project identified the importance of considering psychological variables when understanding CS uptake. In the SR, this was demonstrated by the inconsistent relationship between behavioural variables and CS uptake, and in the EP this was indicated through the absence of relationships between demographic variables and CS uptake. The SR and EP both highlighted the significant role of emotional factors, including trauma symptoms and fear and anxiety, in the understanding of CS. The SR findings identifying the importance of psychological variables to CS uptake encouraged the use of additional analysis within the EP to understand the mediating role of psychological variables.

Interestingly, the SR and EP did not fully align in their findings about the role of cognitive variables. The SR concluded that high levels of knowledge and risk perception consistently related to CS uptake. However, neither of these factors related to intention or

attendance within the EP. The most obvious explanation for the inconsistencies highlighted is the different populations within the SR and EP. Both the SR and EP found that positive beliefs, similar to positive outcome expectancy, related to both intention and attendance. Furthermore, whilst the SR found perceived barriers did not consistently relate to CS uptake, similarly negative outcome expectancy was a non-significant predictor in the EP. The more consistent relationships identified within the SR between cognitive variables and CS uptake, indicates that some cognitive variables, particularly knowledge and risk perception, may have less importance for women who have experienced sexual assault. This may be due to the strength of associations between different types of self-efficacy and CS uptake within the EP. This therefore indicates that for women who have experienced sexual assault, their knowledge of CC and CS and how much they see themselves at risk, are less influential than how much they believe they can regularly attend their CS. Interestingly, the lack of association found between negative outcome expectancy and CS uptake in the EP, although consistent with the SR, is inconsistent with previous research highlighting the barrier of embarrassment (Cadman, Waller, Ashdown-Barr and Szarewski (2012). Again, this could be explained by the importance of self-efficacy.

The somewhat inconsistent findings between the SR and EP, combined with the strong relationship identified between migration and reduced CS uptake, highlights the importance of understanding health behaviours within specific populations. This could potentially be due to the role of self-efficacy within both population groups. The EP demonstrated the mediating role of self-efficacy for trauma symptoms, and self-efficacy has been identified as relating to poorer health in migrants, due to interpreting the adaptive demands required as a result of immigration, as threats rather than challenges

(Jerusalem & Mittag, 1995).

The SR and EP both found some psychological variables related to either intention or attendance, whilst others predicted both outcomes. Combined with the direct relationship between intention and attendance in the EP, this shows that understanding factors related to intention is essential to fully understand attendance. The SR was not able to form a conceptual basis for the EP as they were conducted simultaneously. However the conclusion highlighting the importance of understanding intention and the role of emotional variables, combined with the hypotheses, helped to inform the analyses that were undertaken.

4.1.2 Reflections on the process of the thesis

4.1.2.1 Service-User feedback

Service-user feedback was gathered from a support group for women who had experienced sexual assault. The positive interest expressed from women wanting to participate was encouraging, and the feedback helped guide alterations to increase the accessibility of the study. Due to the idiosyncratic nature of the HAPA inventory, the feedback ensured accessibility and appropriateness, in accordance with previous HAPA research (Arbour-Nicitopoulos, Duncan, Remington, Cairney & Faulkner, 2014). Compliant with feedback, the SPAQ was adapted, as described in the EP. Firstly, as service users indicated women may not remember the age they experienced abuse, the original SPAQ categories were collapsed. Secondly, the wording "in a sexual manner" was removed as feedback stated it could provoke negative feelings if the individual did not see the act as a sexual occasion. For example, an individual may see rape as a

demonstration of power or control, rather than a "sexual act". A final consideration of the SPAQ, was the inclusion of the open question asking about other unwanted sexual experiences. This was kept in to allow for people to have the space to describe their experience, if they did not feel it had previously been acknowledged in the questionnaire. Some women utilised this to provide details of very difficult experiences; however as only the minority of participants completed this, the data could not be used in analysis. This demonstrated the importance of considering all implications of using measures within research. For example, balancing the potential impact of measures on participants, against the benefits to the research findings. Future research drawing on a mixed method or qualitative design could draw on this data. The use of the SPAQ as a clinical tool suggests a potential need for questionnaires to be adapted appropriately when used in research and to consider emotions triggered in service users. Charities and support groups who advertised the study also offered feedback with suggestions as to how it could be improved. Although these were useful recommendations related to the methodology of the study, due to recruitment having commenced by this time, it was not possible to include these alterations. This accentuates the importance of gaining a broad range of service user feedback.

One element not considered prior to commencing the study, was the number of emails received from participants. These included details both about their experience of completing the study and their sexual assault. This bought up the challenge of balancing being a clinician and a researcher, and the need to consider the different boundaries within these positions. The high numbers of women logging in (503) and answering some of the study (285) combined with these emails, reveals a desire within this population to be able to express their experiences of sexual assault. This aligns with the

recent #metoo campaign, which through its aim of highlighting the breadth of sexual assault, has provided a platform to enable women to speak about their sexual assault. The extensive response to this campaign, accentuates how important providing these platforms is.

4.1.2.2 Piloting

Although piloting occurred with women who had not experienced sexual assault, this was useful to ensure the level of 'user-friendliness' of the study. Researchers should therefore be advised to consider technology when using an online platform, and to trial studies on a range of devices to ensure accessibility.

4.1.2.3 Ethics

NHS ethics was sought with the hope of being able to recruit face-to-face from the MyBodyBack charity clinic, which uses an NHS base. This would have enabled increased reliability by including different data collection methods, however, ethical approval was only granted for online recruitment. The most prominent ethical discussion within the research ethics committee meeting was the potential of the study to cause distress to participants, with no hands-on support available due to it being conducted online. In contrast, service-users stated they felt more comfortable answering questions anonymously and confidentially. This highlights dilemmas between perceptions of ethical issues, and the actual experience of service-users. Worryingly, this could act as a barrier to the vital research in this area. Potential solutions could be involving research-related service-users on REC committees, or gaining service-user feedback prior to the ethical application to ensure their views inform those discussions.

The overall recruitment exceeded expectations, and the final sample size was larger than predicted. This allowed for effect sizes to be identified through analyses that may not have been possible in a smaller sample, and a large number of variables to be included in analyses. This also increases the generalisability of the results. One factor extremely likely to have facilitated the large recruitment was the study being re-advertised through social media during cervical cancer prevention week. This campaign week aims to increase awareness of screening and included the #smearforsmear campaign, initiated by Jo's Cervical Cancer Trust. Following my request, charities and support groups re-advertised the study throughout this week, during which there was a spike in recruitment.

4.1.2.4 Methodology

The SR highlighted a wide range of methods used to measure attendance. This could indicate a challenge within health behaviour research in identifying the most reliable method of measuring past behaviour. However, the comparable findings of the three attendance measures included within the EP, suggests that different approaches can generate reliable findings. This increases the reliability of the SR findings, which combines results using different measures.

The inclusion criterion of quantitative studies in the SR was based on the aim of expanding a previous review (Chorley, Marlow, Forster, Haddrell & Waller, 2017), which focused on solely qualitative studies. This also enabled more consistency between the empirical methodology and epistemological stance. Some feedback from participants indicated the want for open questions to allow for details above and beyond the Likert scales, and to offer suggestions for CS improvement. These would have required a mixed methodology, which was beyond the scope of this thesis. Future research could draw on

the current findings and utilise a mixed method approach to allow for qualitative feedback and expand this thesis.

A high level of consistency was found between the methodological appraisal of studies in the SR, and the strengths and limitations within the EP, for example, the use of a cross-sectional design, drawing on self-report methods within an opportunity sample. These elements are often criticised due to their potential for bias. As such, the frequency with which they are drawn upon within health behaviour research highlights methodological challenges within this area of research. The inclusion of 38 studies meant amalgamating the features of the studies was challenging due to the wide range of methodologies, participant groups, outcome measures and independent variables included within the study. Full integration was therefore difficult due to the volume of information.

4.2 Impact

The understanding of CS uptake in women who have experienced sexual assault, and the predictive ability of a health-behaviour model for CS uptake demonstrated the originality of this work.

4.2.1 Clinical impact for women who have experienced sexual assault

The thesis was done in conjunction with a charity, MyBodyBack, therefore the biggest impact of the study is hoped to be there, by providing evidence-based recommendations for their work. Considering the SR and EP together, the thesis supports their work in providing specialised support for women who have experienced sexual assault, as their intention and attendance of CS is influenced by different factors compared to the general population. The difference in variables related to intention and attendance, highlighted in both the SR and EP, demonstrates the importance for both healthcare professionals and women to identify their levels of intention and attendance, in order to provide the most beneficial and appropriate support. As such, prior to providing recommendations, establishing the level of intention and previous attendance a woman has would be favourable. For example asking: "Which of these statements do you most agree with: 1) I don't even know if I want to or intend to attend my next CS; 2) I want to attend but I am not sure I can go ahead with it; 3) I have been before but am unsure about going again (due to either having since experienced a sexual assault, or due to the impact of the previous CS)." These questions relate to the HAPA stages of pre-intenders, intenders, and attenders (Figure 2). Using the findings of the EP, this can inform recommendations for each stage:

1) *I don't even know if I want to or intend to attend my next CS (pre-intenders):*

Based on the findings, women in this group will benefit most from focus around their positive outcome expectancies and task self-efficacy. Enhancing women's views of CS as being important, worthwhile and necessary, rather than focusing on perceived embarrassment, pain, distress, or anxiety is likely to lead to beneficial outcomes. The use of a handout sheet could encourage women to identify personal reasons related to importance and necessity. Secondly, increasing women's belief in their ability to attend can draw on factors related to increasing self-efficacy, including personal mastery and vicarious experience (Bandura, 1977). Hearing about other relatable women who have experienced sexual assault, struggled to attend their CS but succeeded could be used as an intervention, either presented audio-visually on websites/social media, or though a leaflet. Finally, encouraging women to identify previous experiences of struggling to, yet achieving a behaviour can increase self-efficacy through focusing on success to encourage persistence. Again, this could be implemented as an individual intervention or with the support of a professional.

2) *I want to attend but I am not sure I can go ahead with it (intenders):*

The emphasis for these women should be around action and coping planning, and maintenance self-efficacy. The focus for this group should therefore be helping them to plan their CS, including detailing when/where/how they will get their CS. If their self-efficacy is low, tasks such as this will be harder. In the UK, most women are required to book their own CS, therefore support in this area could be very beneficial. For coping planning, compiling a crib sheet of coping strategies for trauma reminders could help those women who are wanting to go, but struggling to translate this into actual attendance. The second part is about focusing on women's confidence in being able to cope if they feel upset by the CS or get reminders of their trauma. Enhancing task mastery through achieving smaller goals (Bandura, 1977), for example reading about CS,

or attending an appointment to discuss CS, could be beneficial. This could also be facilitated through identifying previous experiences of mastering trauma symptoms and focusing on what enabled this (Bandura, 1977). Finally, encouraging women to take an active role and enabling them to feel in control of their environment could help increase self-efficacy. For example, through health care professionals adopting a more collaborative approach throughout the CS by allowing women to undress in their own time and help insert the vaginal speculum.

3) *I have been before but am unsure about going again (due to either having since experienced a sexual assault, or due to the impact of the previous CS):*

For these women, support should target recovery self-efficacy as well as coping planning. Some of the above planning strategies could be beneficial, however tailored to focus more on encouraging women to think about how to cope with previous or potential challenges. In addition, focus on the impact of physiological states on self-efficacy would be beneficial as interpretation of high arousal negatively can reduce self-efficacy (Bandura, 1977). To increase recovery self-efficacy, helping women increase their mastery over the physical symptoms of anxiety could be beneficial. Ideas for this can be drawn from mindfulness techniques including relaxation breathing and imagery techniques. Finally, visualising success could also increase self-efficacy.

Other applicable findings suggest that women can be encouraged to and be able to still attend their CS if they are experiencing trauma symptoms, if their self-efficacy is high. Recommendations based on this thesis also include reducing the focus for women on the nature or age of what happened to them, and instead helping them to think about the impact of it instead.

4.2.1.1 Clinical impact for trauma

For psychological work around sexual trauma, this thesis suggests the need to consider how trauma can affect psychological (e.g. self-efficacy) and behavioural (e.g. CS uptake) factors. It can also hopefully encourage mental health professionals working with women who have experienced sexual assault to consider the impact of self-efficacy. The findings imply a need for a holistic approach when working with women who have experienced trauma, by holding in mind both their mental and physical health and drawing on a biopsychosocial model. The relationship in the SR between risky health behaviours, such as smoking and sexual behaviours, and lower CS attendance, further shows the importance of considering the full impact of trauma on an individual.

A substantial number of women in the EP reported experiencing trauma symptoms (71%), indicating an importance of assessing for and offering support in this area. NICE guidelines for PTSD have not been updated since 2005. The findings in the EP indicate an importance for consideration of the impact of sexual assault within these updates. Furthermore, over half of the sample responded that they had experienced sexual assault in childhood and adulthood, supporting research showing the increased likelihood of re-victimisation following childhood sexual abuse (Ogloff et al., 2012). Awareness of the impact of sexual assault on individuals to make sense of this is crucial to reduce the prevalence of sexual assault. Furthermore, the known relationship between sexual assault and poor health (Golding, 1999) was supported in the EP through the low CS attendance rates, showing consideration for the impact of sexual assault on physical health is crucial.

4.2.2 Clinical impact for health

The lower level of attendance identified in the EP should encourage health professionals to consider both the mental state, and the history of the woman they are encouraging to attend or conducting the CS on. As such, GPs and health care professionals should be encouraged to help identify women's barriers to attendance, rather than focusing on encouraging them to go or highlighting the risks of them not attending. This is particularly important as the EP found that risk perception did not predict intention. A lot of campaigns around encouraging women to attend their CS, however, focus on how many women are diagnosed with and die from CC (e.g. Jo's Cervical Cancer Trust, 2017), rather than identifying how women can be helped to go. Based on the EP, health care professionals encouraging women to book an appointment saying when and where they will attend their CS, and supporting them to re-book missed appointments, is more likely to translate their intention into attendance. This is likely to be more beneficial than the current national system, which requires women to book themselves. A recently developed leaflet around the NHS screening programme focuses more around helping women decide if they want to attend (NHS, 2016). Updated guidelines do acknowledge the need for health care professionals to consider previous experiences of trauma and abuse, however there is an absence of recommendations as to how health care professionals can support women who have experienced abuse. The findings from this study could potentially be used to inform those recommendations.

4.2.3 Personal Impact

During the initial research stages of this project, the high level of similarity between sexual assault experiences and CS, and the extent and range of the analogous aspects of these experiences became clear. The fact that phrases expressed by well-meaning health

professionals such as “just relax” can be a trigger for women who have experienced sexual trauma, highlighted the potential lack of consideration of these similarities within health professionals who offer CS.

The impact of trauma on both directly and indirectly related experiences was also highlighted. As a result, this led me to understand the impact of sexual assault on personal characteristics which impact on every day activities, such as self-efficacy. As such, including self-efficacy in formulations when working with women who have experienced sexual assault will hopefully help to enhance my clinical work.

The importance of terminology, and the impact and meaning this can have on individuals, was shown through feedback from service users. This recommended to not use the word ‘survivor’ or ‘victim’ as they offer different connotations to different people. This led me to reflect on the high amount of media coverage surrounding women who have experienced sexual assault recently, and the consistent use of words such as ‘sufferer’. It highlighted the importance of language and the need to gain advice from the target population in research to ensure accessibility.

4.3 Dissemination

The primary and most important place where this work will be disseminated will be back to the service users who provided their email addresses requesting a summary of the findings. Informing participants of the outcomes of studies can be considered as an ethical obligation to thank participants for their contribution (Fernandez, Kodish, & Weijer, 2003) and to help participants feel valued, thereby increasing future participation (Shalowitz & Miller, 2005). This feels particularly important due to the limited research in this area yet the high prevalence of sexual assault in women. An accessible document summarising the most important findings and their clinical implications and the potential real-world implications, will therefore be disseminated (Appendix 19). If possible, enlisting service-user consultation guidance prior to dissemination will ensure the document is user friendly and the wording is sensitive. Secondly, this will be disseminated to the charities and support groups who advertised the study, for similar reasons stated above. This will ensure to include clinical recommendations for how services can implement the findings into their work.

A third key place for dissemination will be to MyBodyBack – the charity this research was conducted in partnership with. The charity runs specialist CS and maternity clinics for women who have experienced sexual violence. At present their work is primarily experientially informed. The hope of this thesis was to provide some evidence-based suggestions as to how to support women who have experienced sexual assault to attend their CS.

The implication of the methodology of the thesis can be used to inform current British Psychological Society (2017) guidance on Internet mediated research. Methodologically,

it supports the use of an online platform for research involving vulnerable populations or emotive subjects. However, this research highlights the need for updates regarding the use of social media, in particular research being shared beyond the control of the researcher. One of the primary concerns of the ethics committee was the inducement of distress as a result of potential participants seeing the study. This was attenuated by the research being advertised on social media sites relating to sexual assault. However, the advertisement of the study through social media led to the study being re-tweeted and shared to personal accounts. This therefore could have meant women noticed this study whilst not actively seeking information or support for their experiences of sexual assault. Updated guidance as to how to manage this practically and ethically is vital to ensure emotive research does not induce untoward distress in participants.

The content of the emails received and the nature of the questions asked, indicates this study was potentially highly emotive for some participants to complete. As such, it is hoped that the findings can be disseminated to a wide range of audiences, with the hope of supporting women who have experienced sexual assault in attending their cervical smears. This demonstrates the need to balance potential benefits and risks in research (British Psychological Society, 2014).

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6 Appendix

6.1 Appendix 1: Systematic Review Protocol

Psychological variables related to attendance to cervical smears in women: A Systematic Review

Reasons for change from original systematic review:
Chorley et al. (2017) looked at experiences and barriers to cervical screening. Although the research was done in 2015, it was felt this was too close to the original review. The title and aim were therefore adapted to fit more closely to the empirical paper by including quantitative studies only
Prospero was checked and no other systematic reviews similar to this were identified.

Objectives
The objective of this review is to understand what psychological variables are related to attendance to cervical smears in eligible women.

The specific objective of this review is to:
Critically analyse and synthesise data from studies that look at psychological variables that are related to attendance to cervical smears in women.
To identify whether certain psychological variables are more strongly related to attendance than others.

Methods
Criteria for considering studies for this review

Types of studies
Empirical studies using a quantitative methodology will be used. This is in order to develop on Chorley's systematic review. Any type of quantitative study will be included. Studies will need to be written in English. Only empirical studies will be included. Mixed methods will also be included.

Types of participants
Women from any background who are eligible for a cervical smear, this will therefore depend on the eligibility of the countries' screening programme but will approximately range from 20-65 years old. The studies will need to be based in countries with established cervical screening programmes: this list has been developed from Chorley et al. (2017). Only studies will be published after the start of the screening programme will be included

Types of exposure variable
This review will consider all psychological variables. This will include behavioural, emotional and cognitive factors. Practical variables (e.g. physical access to screening, cost/insurance access etc.) and purely demographic variables will not be included in the review. As such, behavioural factors will be those where a choice has been made.

Types of outcome variable
The main outcome variable is attendance – looking both at whether an individual does attend and, if included in the study, how often they attend and whether they meet the recommendations, as well as intention to attend.

Search methods for identification of studies
The search strategy will adhere closely to PRESS guidelines to achieve a good quality evidence base (Sampson et al., 2008). Free text words will be used, with Boolean operators and parentheses for breadth and efficiency. The following search terms will be used:

In title:	"Pap screen" OR "pap screening" OR Papanicolaou test OR Papanicolaou screen OR "Papanicolaou smear" OR "Pap smear" OR "Pap test" OR "Cervical screen" OR "Cervical smear" OR "Smear test" OR "cervical screening" OR "cervical cancer screening" OR "Cervical cancer screen" OR "vaginal smear" OR "liquid base cytology" OR "HPV test"
AND	
In title:	Barrier* OR Facilitat* OR Associat* OR Relat* OR Psycholog* OR Psychosocial OR Psychiatric* OR Behaviour* OR Emotion* OR Affective OR Mood OR Beliefs OR cognitive
AND	
In All Fields:	Australia OR Canada OR Denmark OR Finland OR Iceland OR Italy OR "Republic of Korea" OR Korea OR Netherlands OR Norway OR Slovenia OR Sweden OR Great Britain OR Channel Islands OR England OR Northern Ireland OR Scotland OR Wales OR Poland OR Hungary OR Latvia OR slovenia
AND	
Filter:	English

Peer-reviewed articles will be searched for in the following electronic databases:
PubMed
PsychInfo,

Inclusion criteria
- Title / abstracts will be screened for:
- Meet above search terms
- Studies based in above countries
- Quantitative methodology
- Published after the start date of cervical screening programme (see appendix 1 for details)
- Focusing on barriers/facilitators to attendance

Data collection and analysis

- Data collection and analysis will follow the practice guidelines of PRISMA (Moher et al., 2009) and Systematic Reviews (Centre for Reviews and Dissemination, 2009).
- One reviewer (KM) will carry out the search for the identification of studies, using pre-specified search criteria, this will be done by identifying relevant titles and where possible, abstracts. Over-inclusion will occur at this stage if there is any uncertainty.
- All duplications between databases will be removed.
- The reliability of the inclusion and exclusion criteria will checked by ensuring that key articles identified prior to the search are again identified through the systematic searches.
- Remaining titles and abstracts will then be independently screened for eligibility (KM and LD). Those without enough detail will be included and listed as 'potentially relevant studies'..
- Articles considered relevant by either the reviewer will be retrieved in full text.
- Two reviewers (KM and LD) will assess the eligibility of the retrieved articles and Kappa will be calculated. Any disagreements will be resolved by a third reviewer (ME).
- Exclusions will be reported, with reasons given.
- Two reviewers (KM and LD) will conduct independent data extraction and quality assessment, with a third reviewer resolving disagreements (ME).

Data extraction:

- Authors, year and country of publishing
- Participants: inclusion/exclusion criteria, age, mean age
- Design and sample recruitment
- IV and DV measures
- Significantly statistical findings
- Risk of bias (e.g. selection, attrition, reporting, performance etc.)
- A quality assessment tool will be used to determine risk of bias for each included study. This will be developed based on previous appraisal tools used both in healthcare and for systematic review on quantitative papers.

Data synthesis

Data will not be statistically synthesised due to the large number of different ways of assessing outcomes expected.
Furthermore, non-randomised studies will be included therefore data synthesis is not recommended.

Write up

The review will be written up and reported as per PRISMA statement. This will include compiling a flowchart in the style of PRIMSA statement and ensuring the final report includes those recommended in the PRIMSA statement.

6.2 Appendix 2: Start date of Screening Programme in each Country

Country	Start Date of Screening Programme
Australia	1991
Canada	1989
Denmark	1962
Finland	1963
Iceland	1965
Italy	1999
"Republic of Korea"	1988
Korea	1988
Netherlands	1989
Norway	1995
Slovenia	2003
Sweden	1967
United Kingdom	1988
Poland	2006
Hungary	2003
Latvia	2009
Ireland	2001
Slovenia	2003

6.3 Appendix 3: Ethical Approval (NHS and Royal Holloway)

NHS
Health Research Authority

London - South East Research Ethics Committee
Barlow House
3rd Floor
4 Minshull Street
Manchester
M1 3DZ

Please note: This is the favourable opinion of the REC only and does not allow you to start your study at NHS sites in England until you receive HRA Approval

24 May 2017

Miss Katherine Madden
Camden and Islington NHS Foundation Trust
Department of Clinical Psychology
Royal Holloway
Egham
TW20 0EX

Dear Miss Madden

Study title:	**Identifying factors that facilitate sexual assault survivors to attend their cervical smear**
REC reference:	**17/LO/0790**
IRAS project ID:	**224330**

The Research Ethics Committee reviewed the above application at the meeting held on 10 May 2017. Thank you for attending to discuss the application.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this favourable opinion letter. The expectation is that this information will be published for all studies that receive an ethical opinion but should you wish to provide a substitute contact point, wish to make a request to defer, or require further information, please contact hra.studyregistration@nhs.net outlining the reasons for your request.
Under very limited circumstances (e.g. for student research which has received an unfavourable opinion), it may be possible to grant an exemption to the publication of the study.

Ethical opinion

The members of the Committee present gave a favourable ethical opinion of the above research on the basis described in the application form, protocol and supporting documentation, subject to the conditions specified below. .

Conditions of the favourable opinion

The REC favourable opinion is subject to the following conditions being met prior to the start of the study.

1) Please remove the researcher personal contact details including email and mobile telephone number on the Participant Information Sheet, and replace with study specific contact details

You should notify the REC once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. Revised documents should be submitted to the REC electronically from IRAS. The REC will acknowledge receipt and provide a final list of the approved documentation for the study, which you can make available to host organisations to facilitate their permission for the study. Failure to provide the final versions to the REC may cause delay in obtaining permissions.

Management permission must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements. Each NHS organisation must confirm through the signing of agreements and/or other documents that it has given permission for the research to proceed (except where explicitly specified otherwise).

Guidance on applying for HRA Approval (England)/ NHS permission for research is available in the Integrated Research Application System, at www.hra.nhs.uk or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of management permissions from host organisations.

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database. This should be before the first participant is recruited but no later than 6 weeks after recruitment of the first participant.

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g. when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to request a deferral for study registration within the required timeframe, they should contact hra.studyregistration@nhs.net. The expectation is that all clinical trials will be registered, however, in exceptional circumstances non registration may be permissible with prior agreement from the HRA. Guidance on where to register is provided on the HRA website.

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

Ethical review of research sites

NHS Sites

The favourable opinion applies to all NHS sites taking part in the study taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Summary of discussion at the meeting

Social or scientific value; scientific design and conduct of the study

Although it was assumed that the women taking part in this research would have had a cervical smear test in the past, the Committee requested clarification as to why the proposal had been submitted for REC review as the online questionnaire they would complete would be completely anonymous. There was a consent form which had been submitted for review, however as the research team were not recruiting from an NHS setting the Committee also requested the proposed use of the consent form.

You explained that predominantly the reason for the REC Review was because the research was in conjunction with 'my body back'. Should recruitment not go as planned the team intended to use the platform at St Bart's Hospital to identify and recruit participants.

The Committee advised you that the potential to recruit participants from St Bart's was not detailed in the application form or Protocol therefore that component of recruitment, should it be required would need to be submitted as a Substantial Amendment after the study was up and running. The Committee would only be able to review what had been proposed in the submission which was the completion of the questionnaire online in a completely anonymous format.

You confirmed that the team would continue as proposed and would submit an Amendment if required at a later date.

The Committee requested clarification as to why a comparison or control group was not going to be used to compare with women who haven't been assaulted and don't attend clinic for cervical smear testing.

You explained that there were lots of reasons why women who have not been assaulted didn't attend these appointments which were a separate issue. This study was to compare results within this group only.

The Committee were satisfied with the responses given.

Favourable risk benefit ratio; anticipated benefit/risks for research participants (present and future)

The Committee raised a concern over the potential for distress by the nature of inviting women who had been through such trauma to have to go through the recollection of events whilst completing the questionnaire. Although it had been justified that women would be in that mind frame anyway as they would have found the questionnaire through one of the support websites , additional support may still be required as the level of detail required was very in depth. The assumption was that the women would have a greater level of resilience as they would already be visiting the support websites. As there would be additional support offered via access to links whilst taking part in the questionnaire, the Committee asked for clarification as to what additional support, if any, would be available.

You confirmed that they had given this issue much consideration. As the women would be motivated at that point to seek support the team agrees it was appropriate platform for the questionnaire to minimise distress. The intention was not provoke thoughts in an inappropriate

setting. Additional information could be included in the information sheets for participants to contact should they need additional support such as the CI's email address. The Academic supervisor would check any responses before sending a reply to participants to ensure they were appropriate.

The Committee emphasised that as the questionnaire would not be completed face to face it would not be possible to know if the questionnaire might be the cause of additional distress.

You explained that all options available for support would have been made clear to participants. In the validated questionnaire to be used the questions around physical abuse had been removed to minimise the risk of unnecessary distressed. All the other questions were validated.

The Committee asked if they had been used before in these circumstances within this very vulnerable group.

You explained that they had been unable to locate evidence that it had been used within this population online before, but had in other research. By using an online platform for this study the researchers wanted to use an exploratory questionnaire without the additional anxiety that face to face interviews may bring.

The Committee queried how the research team would know for sure that the impact of the online questionnaire would not have a greater impact than face to face, and if it was of benefit to complete the questionnaire online.

You explained that from their experience there was a higher level of confidence from this group talking about what they had been through anonymously and research also showed that there was less confidence in the face to face setting. There was only one Charity for this cause in London so it was hoped this would result in a greater response also if online.
Not knowing how participants would be feeling at the moment they completed the questionnaire was a limitation of this study; however it was unlikely that women who were accessing those websites had not already been experiencing those feelings of distress.
Furthermore the researchers explained that should anyone withdraw from the study during the questionnaire for whatever reason they would be given information of who to contact for support. Participants would be able to withdraw from the study at any point whilst the questionnaire was still online. Basic demographic data and the participant number would be used to identify the questionnaire to withdraw the participant form the study.

The Committee queried if participants could go back into the questionnaire to access the links once they had completed it at any point later, for example a week after the event.

You confirmed that they would be able to access the links for as long as the questionnaire was available on the website.

The Committee considered all responses given and were satisfied that the concern around distress had been appropriately considered by the research team and that adequate support was in place for participants taking into account the limitations of an anonymous online questionnaire.

Informed consent process and the adequacy and completeness of participant information

The Committee requested that the researchers personal contact details be replaced with study specific contact details. Not only would this be more appropriate, it would also ensure that should the student not be available another member of the study team could respond to any contact made by participants.

Please contact the REC Manager if you feel that the above summary is not an accurate reflection of the discussion at the meeting.

Approved documents

The documents reviewed and approved at the meeting were:

Document	*Version*	*Date*
Copies of advertisement materials for research participants [Study Advert]	1	24 April 2017
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [Indemnity Insurance]	1	27 July 2016
IRAS Application Form [IRAS_Form_24042017]		24 April 2017
IRAS Checklist XML [Checklist_02052017]		02 May 2017
Letter from sponsor [Sponsor approval]		30 January 2017
Letters of invitation to participant [Participation invitation]	1	10 April 2017
Non-validated questionnaire [Demographic Questionnaire]	2	24 April 2017
Non-validated questionnaire [SPAQ]	2	10 April 2017
Non-validated questionnaire [HAPA Inventory]	2	04 April 2017
Participant consent form [Consent form]	2	03 April 2017
Participant information sheet (PIS) [Participant information sheet]	2	10 April 2017
Referee's report or other scientific critique report [Peer review comments and replies]		09 December 2016
Research protocol or project proposal [Thesis protocol]	2	06 April 2017
Summary CV for Chief Investigator (CI) [Katherine Madden CV]		09 March 2017
Summary CV for student [Kate Madden cv]		10 April 2017
Summary CV for supervisor (student research) [Supervisor 2 CV]		09 March 2017
Summary CV for supervisor (student research) [Dr S Gibson]		01 August 2016
Validated questionnaire [Cervical Cancer Awareness Measure]		
Validated questionnaire [PCL-5]		

Membership of the Committee

The members of the Ethics Committee who were present at the meeting are listed on the attached sheet.

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document "After ethical review – guidance for researchers" gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The HRA website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website: http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

17/LO/0790	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project.

Yours sincerely

pp
Professor David Caplin
Chair

E-mail: nrescommittee.london-southeast@nhs.net

Enclosures: *List of names and professions of members who were present at the meeting and those who submitted written comments*

"After ethical review – guidance for researchers"

Copy to: *Mrs Annette Lock*
Vanessa Apea, Infection and Immunity

London - South East Research Ethics Committee

Attendance at Committee meeting on 10 May 2017

Committee Members:

Name	*Profession*	*Present*	*Notes*
Dr Ashok Bhiman	Consultant Psychiatrist	No	
Professor David Caplin	Physicist	Yes	Chair
Ms Stephanie Cooper	Retired Solicitor	Yes	
Mr Ron Driver	Retired University Lecturer/Statistician	Yes	
Professor John Eastwood	Consultant Renal Physician	Yes	
Professor Anthony Fox	Pharmaceutical Medicine	No	
Mr Guy Gardener	Retired Assistant Chief Constable	Yes	
Ms Janelle Hill	Former Banking Administrator	No	
Professor Atholl Johnston	Professor of Clinical Pharmacology	Yes	
Dr Morven Leese	Reader in Biostatistics	Yes	
Prof Eleni Palazidou	Consultant Psychiatrist	No	
Mr Graham Smith	Business Consultant	Yes	
Ms Vanda Taylor	Senior Cancer Information Nurse	No	
Ms Brigid Tucker	Head of Policy & Communications, General Osteopathic Council	Yes	
Professor Zahur Zaman	Retired Clinical Pathologist	Yes	

Also in attendance:

Name	*Position (or reason for attending)*
Ms Julie Acourt	REC Assistant
Mrs Margaret Hutchinson	REC Manager
Miss Shehnaz Ishaq	Deputy Regional Manager
Mr Johnathan Samuel	External Observer

Ethics Review Details

You have chosen to self certify your project.	
Name:	Madden, Katherine (2015)
Email:	PCVA064@live.rhul.ac.uk
Title of research project or grant:	Identifying Factors that Facilitate Cervical Smear Attendance in Women who have Experienced Sexual Assault
Project type:	Royal Holloway postgraduate research project/grant
Department:	Psychology
Academic supervisor:	Dr Michael Evangeli
Email address of Academic Supervisor:	Michael.Evangeli@rhul.ac.uk
Funding Body Category:	No external funder
Funding Body:	
Start date:	01/04/2017
End date:	05/06/2018

Research question summary:

Sexual assault describes unwanted sexual abuse/activity which can involve force and lead to distress (APA, 2016). Women who have been sexual assaulted are significantly less likely to attend cervical smears (Farley et al., 2002) and previous research has identified barriers to attendance (Cadman et al., 2012) but not individualistic factors that facilitate attendance. The Health Action Process Approach (HAPA), a health behaviour model, has been applied to explain and predict intention and attendance to a range of health behaviours, including cervical smears in a typical female population (Luszczynska et al., 2011) however has not been applied to look at why women who have been sexually assaulted do or don't attend their smear. This project aims to use constructs of the HAPA approach to explain what factors facilitate intention and on going attendance of cervical smear tests in women who have been sexually assaulted.

A questionnaire design will be used to look at whether constructs included in the HAPA model can explain intention or attendance to smear tests, above and beyond other possible variables known to also influence intention or attendance.

Multinomial regression will be used to analyse the amount of variance explained by variables in the HAPA model. This is with the aim of informing interventions to support women who avoid cervical smear attendance.

Research questions:

1) Can HAPA variables explain intention and attendance over other confounding variables?

2)Is there a difference in HAPA variables and other confounding variables depending on an individual's level of attendance to their smear?

Research method summary:

The study will be an online questionnaire format that will include 5 different questionnaires. A quantitative, crosssectional, questionnaire design will be employed. The independent variables will be the scores on the HAPA inventory (outcome expectancies, risk perception, maintenance self-efficacy, recovery self-efficacy, coping self-efficacy, action planning and coping planning). The dependent variables will be ratings: intention to attend cervical smears, and level of attendance to cervical smears. The null hypothesis is: there will be no difference in variables between individuals who attend and don't, and those who intend to attend and don't. The design of the study and the exact wording of all questions will be discussed with services users at MyBodyBack to ensure accessibilty and suitability. This will also allow for preliminary pilot analysis to be conducted. A link to the questionnaire will be placed on different websites for approximately 4 months between August 2017 and February 2018. Potential participants will be recruited through seeing the study online, and checked for suitability by confirming they meet inclusion criteria at the start of the study. A minimum sample size of 44 will aim to be recruited. This will allow for power for analysing factors related to intention to be met. However the study will remain on websites past the point this number has been met to gather the largest amount of data possible. Participants will have the option to miss questions if they feel too difficult to answer. They will also have the option of exiting and re-entering the study at different time points. This format has been chosen as previous research has highlighted participants in this client group feel more comfortable and able to answer questions more accurately over an online platform. This will reduce researcher bias. Data will be analysed on SPSS.

Risks to participants

Does your research involve any of the below?
Children (under the age of 16),
No

Participants with cognitive or physical impairment that may render them unable to give informed consent,
No

Participants who may be vulnerable for personal, emotional, psychological or other reasons,
Yes

Participants who may become vulnerable as a result of the conduct of the study (e.g. because it raises sensitive issues) or as a result of what is revealed in the study (e.g. criminal behaviour, or behaviour which is culturally or socially questionable),
Yes

Participants in unequal power relations (e.g. groups that you teach or work with, in which participants may feel coerced or unable to withdraw),
No

Participants who are likely to suffer negative consequences if identified (e.g. professional censure, exposure to stigma or abuse, damage to professional or social standing),
Yes

Details,
Purpose of the study - Regular attendance to smears is strongly recommended as early detection can prevent 75% of cancers (Public Health England, 2015), however research suggests women who are sexual assault survivors are significantly less likely to attend (Cadman et al., 2012; Farley et al., 2002). The study therefore wants to explore facilitative factors for smear attendance in women who have experienced sexual assault. The study will be online and no identifiable personal information will be collected, therefore a proportionate review of the study should suffice.
Valid consent – check boxes will be used to gain informed consent. Statements to consent will be counterbalanced with their wording to encourage participants to read all details included in the consent form. There will also be a button before the debrief stage to confirm again that individuals are happy for their information to be included in the study.
Debriefing – participants will be issued with a debrief sheet, contact details of local support services and the email address of the researcher should follow up questions arise. The questionnaire will be set up so all participants who enter the study, regardless as to what stage they drop out, will receive the debrief information. There will be an option for individuals to email the debrief information to themselves in cases where they however may require this information at a later time.
Withdrawing – the study will be set up with an “exit” or “withdraw” button which will lead the participant to the debrief information. This will help to distinguish between individuals who wish to withdraw their data actively, and those who do not want to continue but are happy for their data to remain in the study. Participants will be provided with an individual ID number and asked to quote this if they wish to withdraw their data after completing the study. They will also be provided with a final date for when these requests will be accepted.
Confidentiality – no identifying information will be requested from individuals. They will only be asked basic demographic questions such as age bracket, ethnicity and socioeconomic status.
Eligibility – as this will be an online study, there is a reduced level of control in regards to ensuring the validity of responses given and experienced had by participants. The inclusion criteria will be clearly detailed at the beginning of the study and there will also be a button included asking participants to confirm they meet the inclusion criteria. The detailed questionnaire regarding what their experience was, the impact it had and the fact the study will be advertised on support websites for women who have experienced sexual assault will help to increase the control.
Minimising harm – participants will be warned of the sensitive nature of the study prior to participating through the

information sheet. They will also be advised they can withdraw at any time point should they become too distressed.
Finally, all participants will be provided with details of support services to contact should they feel distressed.
Lack of face to face contact with the researcher - it was deemed that conducting the research online would maintain the highest level of confidentiality, and previous research indicates this client group feel more comfortable discussing intimate details on an online platform as compared to face to face. Furthermore, by placing the link to the project on websites offering support for survivors of sexual assault, the individual will already be seeking out information related to their assault prior to accessing the study.
Questionnaire inclusion - no previous research has looked at the influence of trauma symptoms on an individuals intention or attendance to cervical smear therefore this was felt to be particularly important. A short, validatedquestionnaire will be chosen with the aim of reducing possible distress.
Design - the design has been peer reviewed and will be discussed with services users from MyBodyBack service.
Risks and benefits - the main possible risk in participation is that it could generate feelings of distress as it asks participants details related to their sexual assault. However by being placed on websites for survivors of sexual assaults, the individual will already be thinking about and seeking information related to sexual assaults prior to accessing the study. Details of support services will also be provided. In terms of benefits, it will be highlighted to participants that participation will help to inform knowledge related to why women who have experienced sexual trauma may struggle to attend their smear, in order to develop future support for them. Furthermore, the information will be used to inform practice at the My Body Back service as well as other services offering support to survivors of sexual assault.

Design and Data

Does your study include any of the following?

Will it be necessary for participants to take part in the study without their knowledge and/or informed consent at the time?,
No

Is there a risk that participants may be or become identifiable?,
No

Is pain or discomfort likely to result from the study?,
No

Could the study induce psychological stress or anxiety, or cause harm or negative consequences beyond the risks encountered in normal life?,
Yes

Does this research require approval from the NHS?,
Yes

If so what is the NHS Approval number,
224330

Are drugs, placebos or other substances to be administered to the study participants, or will the study involve invasive, intrusive or potentially harmful procedures of any kind?,
No

Will human tissue including blood, saliva, urine, faeces, sperm or eggs be collected or used in the project?,
No

Will the research involve the use of administrative or secure data that requires permission from the appropriate authorities before use?,
No

Will financial inducements (other than reasonable expenses and compensation for time) be offered to participants?,
No

Is there a risk that any of the material, data, or outcomes to be used in this study has been derived from ethically-unsound procedures?,
No

Details,

Risks to the Environment / Society

Will the conduct of the research pose risks to the environment, site, society, or artifacts?,
No

Will the research be undertaken on private or government property without permission?,
No

Will geological or sedimentological samples be removed without permission?,
No

Will cultural or archaeological artifacts be removed without permission?,
No

Details,

Risks to Researchers/Institution

Does your research present any of the following risks to researchers or to the institution?

Is there a possibility that the researcher could be placed in a vulnerable situation either emotionally or physically (e.g. by being alone with vulnerable, or potentially aggressive participants, by entering an unsafe environment, or by working in countries in which there is unrest)?,
No

Is the topic of the research sensitive or controversial such that the researcher could be ethically or legally compromised (e.g. as a result of disclosures made during the research)?,
No

Will the research involve the investigation or observation of illegal practices, or the participation in illegal practices?,
No

Could any aspects of the research mean that the University has failed in its duty to care for researchers, participants, or the environment / society?,
No

Is there any reputational risk concerning the source of your funding?,

No

Is there any other ethical issue that may arise during the conduct of this study that could bring the institution into disrepute?,

No

Details,

Declaration

By submitting this form, I declare that the questions above have been answered truthfully and to the best of my knowledge and belief, and that I take full responsibility for these responses. I undertake to observe ethical principles throughout the research project and to report any changes that affect the ethics of the project to the University Research Ethics Committee for review.

Certificate produced for user ID, PCVA064

Date:	12/06/2017 10:06
Signed by:	Madden, Katherine (2015)
Digital Signature:	Katherine Madden
Certificate dated:	6/12/2017 10:26:39 AM
Files uploaded:	REC Favourable opinion.pdf

6.4 Appendix 4: Demographic Questions (Word version)

Please answer the following Demographic Questions

What is your age?

_____

Which of these best describes your ethnic group?

White British/Irish	Black African	Asian Bangladeshi	Mixed White and Asian
White Other	Black Caribbean	Asian India	Mixed White and African
Chinese	Other Black background	Asian Pakistani	Mixed White and Black Caribbean
Prefer not to say	Other ethnic group:…….	Other Asian background	Other mixed background

Were you born in the UK?

- ○ Yes
- ○ No

If no, where were you born?

_____

If no, how old were you when you came to the UK?

_____

What is the highest level of education you have completed?

No qualifications	GCSEs (or equivalent)	A Levels (or equivalent)	Prefer not to say
Bachelors Degree	Masters Degree	Doctoral Degree	

How would you describe your relationship status?

Single	In a relationship	Married/ living together	Divorced/ Separated	Widowed	Prefer not to say

Have you, a member of your family or a close friend ever had cervical cancer?

Yes	No	Don't know

6.5 Appendix 5: Health Action Process Approach (Word version)

The following questions are about your experience and attitude towards cervical smear tests

How many smears have you been invited to?

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Don't know

How many smears have you attended?

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Don't know

How much do you agree with the following statement: "I plan to attend a cervical smear in the next 5 years"?

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

How much do you agree with the following statement: "In the past, I have gone for my cervical smear when invited"?

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

How long is it since your last smear?

0-3 years 3-5 years 5 years +

How likely is it that you will attend your next cervical smear?

Extremely likely	Moderately likely	Slightly likely	Neither likely nor unlikely	Slightly unlikely	Moderately unlikely	Extremely unlikely

I believe that the likelihood of me developing cervical cancer at some point in my life is...

Extremely likely	Moderately likely	Slightly likely	Neither likely nor unlikely	Slightly unlikely	Moderately unlikely	Extremely unlikely

The chance of someone my age developing cervical cancer at some point in their life is...

Extremely likely	Moderately likely	Slightly likely	Neither likely nor unlikely	Slightly unlikely	Moderately unlikely	Extremely unlikely

For me, attending a smear in the next 5 years would be:

Embarrassing - 7 6 5 4 3 2 1 – no emotion

For me, attending a smear in the next 5 years would be:

Painful - 7 6 5 4 3 2 1 – not painful

For me, attending a smear in the next 5 years would be:

No emotion - 7 6 5 4 3 2 1 – unpleasant

For me, attending a smear in the next 5 years would be:

Distressing - 7 6 5 4 3 2 1 – no emotion

For me, attending a smear in the next 5 years would be:

No emotion - 7 6 5 4 3 2 1 – frightening

For me, attending a smear in the next 5 years would be:

Anxiey provoking - 7 6 5 4 3 2 1 – no emotion

For me, attending a smear in the next 5 years would be:

Extremely important - 7 6 5 4 3 2 1 – not important at all

For me, attending a smear in the next 5 years would be:

Very unnecessary - 7	6	5	4	3	2	1 – very necessary

For me, attending a smear in the next 5 years would be:

Not worthwhile - 7	6	5	4	3	2	1 – very worthwhile

It can be hard to regularly attend your cervical smear. How certain are you that you can attend your next cervical smear test?

Not certain at all - 7	6	5	4	3	2	1 – very certain

How certain are you that you can attend cervical smear tests regularly?

Not certain at all - 7	6	5	4	3	2	1 – very certain

How much do you agree with the following statements?
"I feel confident I can regularly attend cervical smears even if I feel worried/anxious/tense"

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

"I feel confident I can regularly attend cervical smears even if I do not feel worthy"

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

"I feel confident I can regularly attend cervical smears even if it causes me physical pain"

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

"I feel confident I can regularly attend cervical smears even if I get a negative or bad result"

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

"I feel confident I can regularly attend cervical smears even if I don't get any social support"

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

"I am confident I can continue to attend cervical smear tests even if I don't attend/cancel my first booking"

Strongly agree	Agree	Moderately agree	Neither agree nor disagree	Moderately disagree	Disagree	Strongly disagree

"I am confident I can continue to attend cervical smear tests even if I ignore the first reminder"

Strongly disagree	Disagree	Moderately disagree	Neither agree nor disagree	Moderately agree	Agree	Strongly agree

"I know when I will get my next smear"

Definitely true - 7 6 5 4 3 2 1 – Definitely false

"I know where I will get my next smear"

Definitely true - 7 6 5 4 3 2 1 – Definitely false

"I know how often I will get smear tests"

Definitely true - 7 6 5 4 3 2 1 – Definitely false

"I am confident I can think about things that may stop me attending my next smear test"

Not confident at all - 7 6 5 4 3 2 1 – Very confident

"I am confident I can think of ways to cope with things that may stop me from attending smear tests"

Very confident - 7 6 5 4 3 2 1 – Not confident at all

"I feel confident I know how to cope if I get reminders of my trauma during or after the smear test"

Very confident - 7 6 5 4 3 2 1 – Not confident at all

"I feel confident I know how to cope if I get upset during the smear test"

Not confident at all - 7 6 5 4 3 2 1 – Very confident

6.6 Appendix 6: Cervical Cancer Awareness Measure (adapted for closed questions only; Word Version)

The following questions are about your knowledge of cervical cancer. This is not meant to be a test so please just answer as honestly as you can.

Do you think vaginal bleeding between periods could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think persistent lower back pain could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think a persistent vaginal discharge that smells unpleasant could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think discomfort or pain during sex could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think menstrual periods that are heavier or longer than usual could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think persistent diarrhoea could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think vaginal bleeding after the menopause could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think persistent pelvic pain could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think vaginal bleeding during or after sex could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think blood in the stool or urine could be a sign of cervical cancer?	Yes	No	Don't Know
Do you think unexplained weight loss could be a sign of cervical cancer?	Yes	No	Don't Know

In the next year, who is most likely to develop cervical cancer in the UK?

- A woman aged 20-29 years
- A woman aged 30-49 years
- A woman aged 50-69 years
- A woman aged 30-49 years
- A woman aged 50-69 years
- Cervical cancer isn't related to age

How much do you agree that each of these can increase a woman's chance of developing cervical cancer?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Infection with HPV	○	○	○	○	○
Smoking any cigarettes at all	○	○	○	○	○
Having a weakened immune system (e.g. because of HIV/AIDS, immunosuppressant drugs)	○	○	○	○	○
Long term use of a contraceptive pill	○	○	○	○	○
Infection with Chlyamydia (a sexually transmitted infection)	○	○	○	○	○
Having a sexual partner who is not circumcised	○	○	○	○	○
Starting to have sex at a young age (before age 17)	○	○	○	○	○
Having many sexual partners	○	○	○	○	○
Having many children	○	○	○	○	○
Having a sexual partner with many previous partners	○	○	○	○	○
Not going for regular smear tests	○	○	○	○	○

As far as you are aware, is there an NHS cervical cancer screen programme?
Yes No Don’t know

As far as you are aware, is there an NHS vaccination to protect against cervical cancer?

Yes No Don’t know

6.7 Appendix 7: Sexual and Physical Assault Questionnaire (adapted; Word Version)

The following questions are about your experience of sexual assault.

Has anyone ever exposed the sex organs of their body to you when you did not want it?

- ☐ As a child (15 years old or younger)
- ☐ As an adult (16 years or older)
- ☐ No

Has anyone ever threatened to have sex with you when you did not want it?

- ☐ As a child (15 years old or younger)
- ☐ As an adult (16 years or older)
- ☐ No

Has anyone ever touched the sex organs of your body when you did not want this?

- ☐ As a child (15 years old or younger)
- ☐ As an adult (16 years or older)
- ☐ No

Has anyone ever made you touch the sex organs of their body when you did not want this?

- [ ] As a child (15 years old or younger)
- [ ] As an adult (16 years or older)
- [ ] No

Has anyone ever forced you to have sex when you did not want this?

- [ ] As a child (15 years old or younger)
- [ ] As an adult (16 years or older)
- [ ] No

Have you had any other unwanted sexual experiences not mentioned above?

- ○ Yes
- ○ No

If so, can you give a short description of what was involved?

_____

6.8 Appendix 8: PTSD Checklist – 5 (Word Version)

The following questions are about different symptoms you may or may not be experiencing.

Below is a list of problems that people sometimes have in response to a stressful experiences as described above. Please read each problem carefully and then click one of the responses to indicate how much you have been bothered by that problem in the past month. In the past month, how much were you bothered by:

	Not at all	A little bit	Moderately	Quite a bit	Extremely
Repeated, disturbing, and unwanted memories of the stressful experience?	○	○	○	○	○
Repeated, disturbing dreams of the stressful experience?	○	○	○	○	○
Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	○	○	○	○	○
Feeling very upset when something reminded you of the stressful experience?	○	○	○	○	○
Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	○	○	○	○	○
Avoiding memories, thoughts, or feelings related to the stressful experience?	○	○	○	○	○
Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	○	○	○	○	○
Trouble remembering important parts of the stressful experience?	○	○	○	○	○
Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	○	○	○	○	○
Blaming yourself or someone else for the stressful experience or what happened after it?	○	○	○	○	○

Having strong negative feelings such as fear, horror, anger, guilt, or shame?	○	○	○	○	○
Loss of interest in activities that you used to enjoy?	○	○	○	○	○
Feeling distant or cut off from other people?	○	○	○	○	○
Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	○	○	○	○	○
Irritable behaviour, angry outbursts, or acting aggressively?	○	○	○	○	○
Taking too many risks or doing things that could cause you harm?	○	○	○	○	○
Being “superalert” or watchful or on guard?	○	○	○	○	○
Feeling jumpy or easily startled?	○	○	○	○	○
Having difficulty concentrating?	○	○	○	○	○

6.9 Appendix 9: Consent Form

CONSENT FORM

Name of Researcher: Kate Madden

Title of Research: Identifying factors that facilitate Cervical Smear Attendance in Women who have experienced sexual assault

Please initial box

1. I confirm that I have read the information sheet dated 05/06/2017, version3 for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason, without my medical care or legal rights being affected. ☐
3. I can confirm I am above the age of 25 years old and have received a minimum of one invite to cervical smear test. ☐

Name of Participant	Date	Signature

6.10 Appendix 10: Information Sheet

Participant Information Sheet

Study Title:
Identifying the factors that facilitate sexual assault survivors to attend their cervical smear tests

Invitation and brief summary:
We would like to invite you to take part in this research study. Joining it is completely up to you. Attending your cervical smear is important but it can often be difficult, especially for women who have experienced sexual assault. You are being invited to join this study because by accessing this website, you may have experienced sexual assault at some point. The study is a set of questionnaires asking about your experience and knowledge of cervical smear testing, symptoms you may/may not experience and a few details of your experience of sexual assault. Women who have been invited to a smear test and have experienced sexual assault of some kind at any point in their lifetime are eligible for the study.

What's involved:
The study is all based online, and will take approximately 20-40 minutes to complete. It will involve a few questionnaires. No personally identifiable information will be asked of you so your data will be stored with a participant ID number.

Purpose of the study:
Previous research has shown that women who have experienced a form of sexual assault at some point in their lifetime are significantly less likely to attend their cervical smear. This study therefore proposes to understand more about what factors may be related to how often women who have experienced sexual assault intend to and do attend their cervical smear. This is with the hope that this could inform support for those who do not regularly attend. This study is being conducted in connection with MyBodyBack, a charity set up to support women who have experienced sexual assault or rape.

Who is running the study:
The study is being run by a research team. The Principal Investigator is Kate Madden, Trainee Clinical Psychologist at Royal Holloway University of London, being supervised by Dr Michael Evangeli, Senior Lecturer at Royal Holloway University of London, and

Dr Stuart Gibson, Consultant Clinical Psychologist at Barts Health. The study is being run in conjunction with MyBodyBack.

What will happen with the results:
The results of the study will be shared with MyBodyBack and other charities designed to help women who have been sexually assaulted and possibly published in journals. You can also request to receive a summary of the findings of the study over email.

Benefits/risks of taking part:
Some questions may cause you to feel some distress, as they are related to difficult memories. You also do not have to answer every question if some feel too distressing. There is also a list of support services included at the end, should you feel distressed. The benefits of taking part in this study are that your participation will help to inform work to support other women who have experienced sexual assault or rape and offering recommendations for those women who find attending cervical smears impossible or extremely distressing.

Information about data storage:
The study is completely anonymous and you will be asked for no personal, identifying information. All data will be stored anonymously using your individual participant ID number in a database, which can only be accessed by the research team. The data will be stored for up to 12 months after the study is completed.

Extra information:
If you have any questions at this stage, or if you have any concerns during the study, please contact Kate Madden at cervicalsmearstudyRHUK@outlook.com or leave a message on 01784 414012.
Please be aware that you can withdraw your information from the study at any point until the end of February 2018 by contacting Kate on the above email address. The study is being run by Royal Holloway University of London, in connection with MyBodyBack and has gained ethical approval from Research Ethics Committee and Royal Holloway University of London Ethics Committee. Thank you for taking the time to read this and to consider taking part in this study, you will now be asked some questions about whether you agree to take part in the study.

6.11 Appendix 11: Debrief Sheet

Debrief Sheet
Thank you for taking the time to complete the study – your participation is very much appreciated.

What was the aim of the study?
The purpose of the study was to explore what factors are related to attendance and intention to attend cervical smears in women who have experienced sexual assault.

What happens next?
All data will be stored securely and confidentiality. Once the study has closed, the data will be analysed. The information you have entered will be used to find out which of the questionnaires you just answered is more associated with how much someone intends to attend their smear and actually attends their smear.

Where to get support?
If the study has caused you any distress and you feel you would like to speak to someone about how you are feeling, we would recommend you contact the following charities and organisations for support:

- My Body Back: www.mybodybackproject.com (to support women around a year onwards after their sexual assault)
- www.rainn.org
- www.thesurvivorstrust.org
- Call the Samaritans – 116 123 (24 hours) or email jo@samaritans.org
- The Havens: 020 3299 6900 or www.thehavens.org.uk
- Rape and Sexual Abuse Support Centre: 0808 802 9999 or www.rasac.org.uk
- SafeLine: 0808 800 5008
- SupportLine: 01708 765 200
- Contact your GP
- Pandora's Project: www.pandys.org (support for LGBTQ survivors of rape and sexual abuse)
- Jo's Cervical Cancer Trust www.jostrust.org.uk
- Eve Appeal Gynaecological Cancer Charity – www.eveappeal.org.uk

Extra information:
If you have any questions at this stage, please contact Kate Madden at cervicalsmearstudyRHUL@outlook.com

Please be aware that you can withdraw your information from the study at any point by contacting Kate on the above email address. The study is being run by Royal Holloway University of London, in connection with MyBodyBack and has been peer reviewed.

If you would like to receive a summary of the results direct to you, please provide your email address below (please note this will not be linked to the answers you have given).

6.12 Appendix 12: Multicollinearity VIFs and Tolerances for Multiple and Hierarchical Regressions

Regression Analysis	VIF Range (*M*)	Tolerance Range
1a) Multiple Regression with Intention as outcome variable and HAPA variables as predictor variables.	1.17-4.92 (*M*=2.36)	0.21-0.86
1a) Hierarchical Regression with Intention as outcome variable, attendance-related HAPA variables entered as Step 1; intention-related HAPA variables entered as Step 2.	Model 1 (1.44-2.40; *M* = 1.93) Model 2 (1.17-4.92; *M*=2.44)	Model 1= 0.42-0.70; Model 2= 0.20-0.86)
2a) Multiple Regression with Attendance as outcome variable HAPA variables as predictor variables	1.17-4.77 (*M* = 2.59)	0.21-0.87
2a) Hierarchical regression model with intention-related variables entered as Step 1; attendance-related variables at Step 2; and attendance as the outcome variable	Model 1: 1.15-3.28 *M*= 2.20; Model 2= 1.17-4.37, *M*= 2.74	Model 1: 0.31-0.87 Model 2=0.23-0.85

6.13 Appendix 13: Multiple regression with intention as outcome variable and HAPA variables as predictor variables

Table 12: Multiple Regression with intention as outcome variable and HAPA variables as predictor variables

	B	SE *β*	*β*
(Constant)	-.426	.777	
Risk Perception	.165	.171	.034
Positive Outcome Expectancy	.392	.116	.148***
Negative Outcome Expectancy	.098	.131	.033
Task Self-Efficacy	.542	.115	.303***
Maintenance Self-Efficacy	.640	.156	.294***
Recovery Self-Efficacy	.342	.102	.143***
Action Planning	.273	.094	.116**
Coping Planning	.054	.121	.022

Note. ***p<.001; **p<.001;

6.14 Appendix 14: Multiple regression with attendance as outcome variable and HAPA variables as predictor variables

Table 13: Multiple Regression with attendance as outcome variable HAPA variables as predictor variables.

	B	SE *β*	*β*
(Constant)	.799	.613	
Intention	.031	.052	.056
Risk Perception	-.057	.135	-.021
Positive Outcome Expectancy	.106	.093	.072
Negative Outcome Expectancy	.179	.103	.109
Task Self-Efficacy	.284	.095	.287**
Maintenance Self-Efficacy	.335	.127	.278**
Recovery Self-Efficacy	-.153	.082	-.116
Action Planning	.194	.075	.149*
Coping Planning	-.017	.095	-.013

Note. **p<.01

6.15 Appendix 15: Multiple regression with PCL-5 score and nature of abuse as predictor variables and intention as the outcome measure

Table 14: Multiple Regression with PCL-5 score and nature of abuse as predictor variables and intent as the outcome measure

	B	SE *β*	*β*
(Constant)	11.249	.954	
PCL-5 score	-.036	.015	-.165*
Nature of abuse	-.235	-.915	-.017

Note. *$p<.05$

6.16 Appendix 16: Multiple regression with PCL-5 score and age of abuse as predictor variables and intention as the outcome measure

Table 15: Multiple Regression with PCL-5 score and nature of abuse as predictor variables and intent as the outcome measure

	B	SE *β*	*β*
(Constant)	10.611	1.068	
PCL-5 score	-.035	.014	-.163*
Age of abuse:			
- Both adulthood			
and childhood	.102	.338	.020
- Adulthood	.780	.673	.077
- Childhood	.	.	.

Note. *p<.05

6.17 Appendix 17: Multiple regression with PCL-5 score and nature of abuse as predictor variables and attendance as the outcome measure

Table 16: Multiple Regression with PCL-5 score and nature of abuse as predictor variables and intent as the outcome measure

	B	SE *β*	*β*
(Constant)	5.146	.520	
PCL-5 score	-.021	.008	-.178**
Nature of abuse	.051	.499	.007

Note. **p<.01

6.18 Appendix 18: Multiple regression with PCL-5 score and age of abuse as predictor variables and attendance as the outcome measure

Table 17: Multiple Regression with PCL-5 score and age of abuse as predictor variables and attendance as the outcome measure

	B	SE *β*	*β*
(Constant)	5.048	.583	
PCL-5 score	-.022	.008	-.185**
Age of abuse:			
- Both adulthood and childhood	.110	.185	.040
- Adulthood	-.320	.367	-.058
- Childhood	.	.	.

Note. **p<.01

6.19 Appendix 19: Dissemination document

What was the aim of the study?

The study aimed to understand more about what helps some women regularly attend their cervical smear after experiencing sexual assault, and what makes it harder for others to attend.

How was the study under taken?

The study was advertised on social media of charities and support groups for women who have experienced sexual assault. It included five questionnaires, which were asked online:

- Personal characteristics
- Questionnaire based on a behaviour model called the Health Action Process Approach, which helps us understand why people do some behaviours. This asked about different psychological factors that may help or hinder attending a cervical smear test
- Knowledge about cervical cancer
- Women's experiences of sexual assault
- Experiences of trauma symptoms

What were the findings?

The study found that this model, the Health Action Process Approach, really helped us to understand what helps some women continue to go for their smear after experiencing sexual assault.

The main finding was that a concept known as "self-efficacy" (self-confidence) was most helpful in understanding what helps women want to go to their cervical smear and actually go to their cervical smear. This means that women with belief in their ability to go for their smear test, can keep attending every 3-5 years even if they find the process difficult for any reason.

The study also found that focusing on why smears are personally important and necessary is more likely to help women to keep attending, rather than focusing on the negative or risks if they don't go.

Interestingly, the study found that the experience of sexual assault, the age that women experienced their assault, and how much it led to the women to experience trauma symptoms, didn't actually relate to how much women wanted to or did attend their cervical smear. This means that it is not so much about what happened, but more about feeling confident in planning and managing the smear test that will help smear attendance.

What does this mean?

The findings of this study can help us think of ways to help women to attend their cervical smear after experiencing sexual assault (see flowchart for summary).

Firstly, its about determining how much women intent to go to their smear, or having been to their smear in the past.

** I don't even know if I want to or intend to attend my next cervical smear (pre-intenders):*
Increasing confidence to attend your first smear:

- Achieve small goals and celebrate each step e.g. researching cervical smear
- Hear about other women who might be similar to you, who have attended their smear after experiencing sexual assault
- Think about times you have struggled to achieve something, but managed to succeed
- Focus on times you have achieved a difficult task
- feel in control of your environment as much as possible, this could be having time to talk to the health professionals, having a break at any point or being involved in inserting the speculum yourself.

Thinking about the positive outcomes of going:

- Identify personal reasons why attending a smear would be important, necessary and worthwhile
- Focus less on reducing worries about attending
- To help identify positive reasons, a hand-out sheet could encourage women to identify personal reasons related to importance and necessity.

** I want to attend but I am not sure I can go ahead with it (intenders):*
Feeling confident about going even if the process is difficult:

- Think about ways you will cope if the smear is difficult. Think about what will help you during and after the smear
- Think about what has helped in the past when you have become upset or thought about your sexual assault
- Focus on times your have succeeded in managing reminders of your trauma
- Think about whether being able to control parts of the smear will be helpful

- Achieve smaller goals for example reading about cervical smear, or attending an appointment to discuss the smear

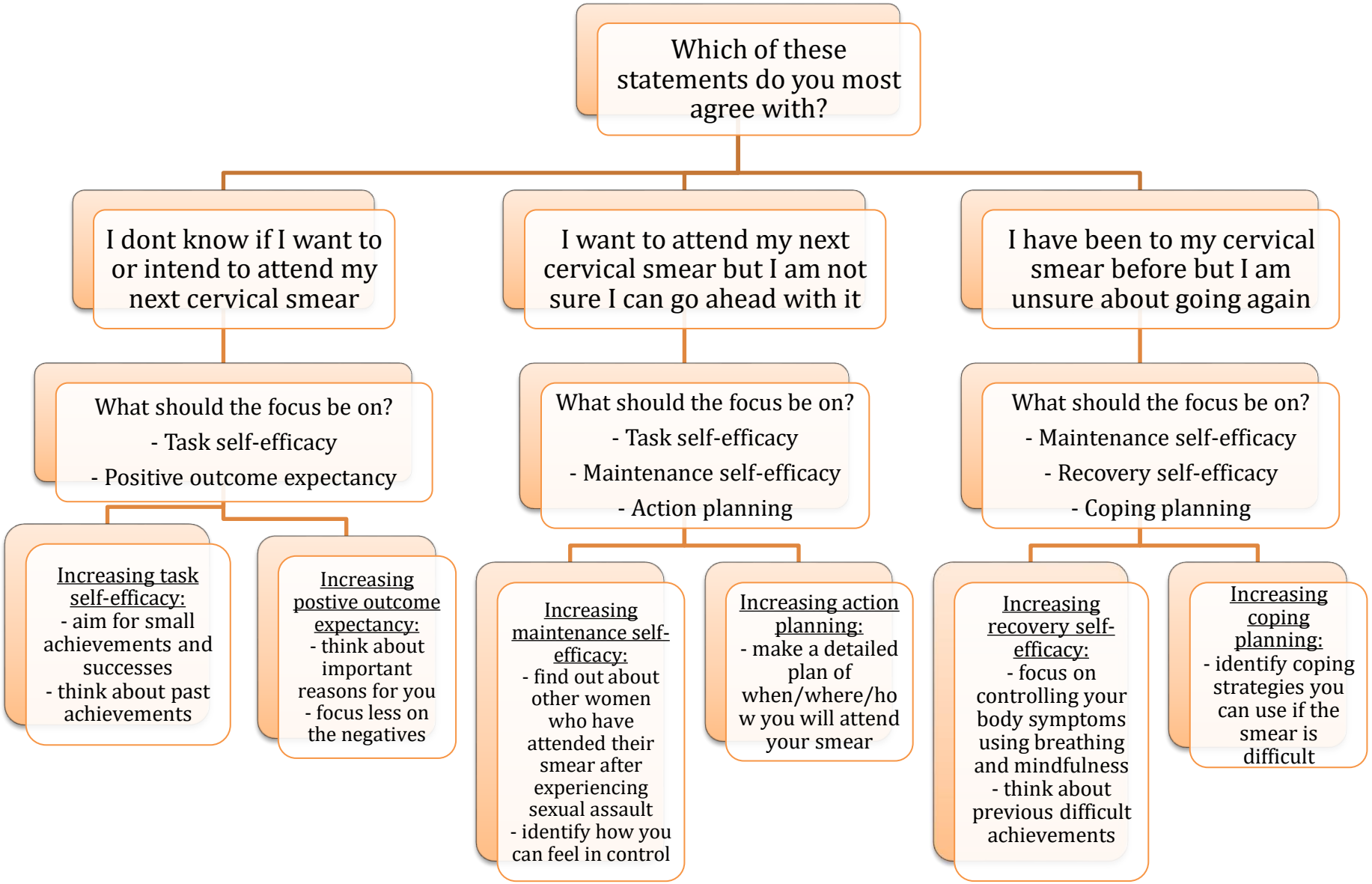
Helping increase your confidence through planning:

- Make a detailed plan about when/where/how they will attend your next cervical smear
- Maybe ask a friend to help you with this
- Think about what coping strategies you can use if you aren't able to attend your smear
- Think about what helped you to cope in the past with difficult situations

** I have been before but am unsure about going again (due to either having since experienced a sexual assault, or due to the impact of the previous CS):*

Increasing confidence in going for another smear:

- Focus on controlling your physical symptoms such as your heart racing or feeling nervous through mindfulness and relaxation
- Use breathing techniques
- Think about times in the past your trauma has stopped you doing something, but you were able to find a way start doing that thing again


Which of these statements do you most agree with?
I dont know if I want to or intend to attend my next cervical smear
I want to attend my next cervical smear but I am not sure I can go ahead with it
I have been to my cervical smear before but I am unsure about going again
What should the focus be on?
- Task self-efficacy
- Positive outcome expectancy
What should the focus be on?
- Task self-efficacy
- Maintenance self-efficacy
- Action planning
What should the focus be on?
- Maintenance self-efficacy
- Recovery self-efficacy
- Coping planning
Increasing task self-efficacy:
- aim for small achievements and successes
- think about past achievements
Increasing postive outcome expectancy:
- think about important reasons for you
- focus less on the negatives
Increasing maintenance self-efficacy:
- find out about other women who have attended their smear after experiencing sexual assault
- identify how you can feel in control
Increasing action planning:
- make a detailed plan of when/where/how you will attend your smear
Increasing recovery self-efficacy:
- focus on controlling your body symptoms using breathing and mindfulness
- think about previous difficult achievements
Increasing coping planning:
- identify coping strategies you can use if the smear is difficult