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Article

The Kenyan Survivors of Sexual Violence Network: Preserving Memory Evidence with a Bespoke Mobile Application to Increase Access to Vital Services and Justice

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Abstract: Police interviews gather detailed information from witnesses about the perpetrator that is crucial for solving crimes. Research has established that interviewing witnesses immediately after the crime maintains memory accuracy over time. However, in some contexts, such as in conflict settings and low-income countries, witness interviews occur after long delays, which decreases survivors' access to vital services and justice. We investigated whether an immediate interview via a mobile phone application (SV_CaseStudy Mobile Application, hereafter MobApp) developed by the Kenyan Survivors of Sexual Violence Network preserves people's memory accuracy over time. Participants (N = 90) viewed a mock burglary and were then interviewed either immediately using MobApp or MobApp+ (which included additional questions about the offender's behaviour) and again one week later (n = 60), or solely after a one-week delay (n = 30). We found that memory accuracy one week later was higher for participants immediately interviewed with MobApp or MobApp+ compared to those interviewed solely after a one-week delay. Additionally, memory accuracy was maintained for those interviewed with the mobile application across the one-week period. These findings indicate that the mobile phone application is promising for preserving memory accuracy in contexts where crimes are reported to the police after a delay.

Keywords: gender-based violence; sexual violence; Kenya; memory; behavioural crime linkage; access to justice

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1. Introduction

Statements and testimony given by witnesses, which include that of victim survivors and bystanders (e.g., the victim's family, community members), are vitally important in criminal investigations [1]. The information they provide often includes a description of the perpetrator's physical appearance and behaviours, which can aid in perpetrator identification and provide leads in securing and interpreting forensic evidence [2]. However, due to demands on police time and other resource constraints, there are often lengthy delays between the crime and when the police can gather statements from witnesses [3,4]. The length of the delay can affect a witness' ability to recollect, or recall, information about the crime. Research has found that recall is optimal immediately after a witnessed event; but, as the delay between the event and the first recall attempt increases, the number of correct details recalled decreases [5,6]. However, research has found that the sooner a witness is interviewed, the fewer details that they will forget about the crime over time [3]. This matters because a witness will provide statements several times over the course of justice

proceedings, such as recalling the crime to first responders (e.g., human rights defenders, community health volunteers, police, medical personnel), criminal investigators, and jurors in court. Thus, a relatively early interview can preserve the witness' memory for longer, leading to more accurate memory evidence over time.

Interviewing witnesses soon after a crime, however, is challenging even in the best of circumstances (e.g., when a police station, well-trained interviewers, and a secure environment are available) [7]. Interviewing in sexual violence cases is especially difficult in conflict settings and contexts where insufficient resources are available for investigations and survivors are stigmatised, such as Kenya [8]. To overcome these obstacles, communities in Kenya are documenting sexual and gender-based violence (SGBV) incidents using a mobile application. This work is being organised by the Wangu Kanja Foundation (WKF), a Kenyan non-profit organisation that focuses on promoting prevention, protection, and response in ending sexual violence in the country. The vision of the foundation is towards a society that is safe and free from all forms of violence. The WKF convenes the Survivors of Sexual Violence in Kenya Network (hereafter the Network) that brings together survivors of sexual violence, which includes women, men, and children, to amplify their voices towards restoring their dignity and assisting survivors in accessing vital services and justice in a timely manner (e.g., police, medical, safe shelters, and other agencies that promote the safety of the victim).

The WKF has pioneered a mobile phone application (SV_CaseStudy Mobile Application, herein MobApp) to interview survivors, that allows survivors the opportunity to report and document anonymously should they wish to. Moreover, whilst anyone can utilise MobApp on their own or someone else's mobile device, currently MobApp is primarily being used by the Network, which spans across all 47 counties of Kenya. Members of the Network are sexual violence survivors who are also human rights defenders and community health volunteers, trained in a trauma sensitive manner to respond to incidents of SGBV within their community. The Network is using MobApp to interview survivors, following provision of informed consent, to obtain an early account of violations and track cases across the referral pathway (e.g., health, security, and justice mechanisms). MobApp records are currently held by the WKF; however, a survivor can access them at any point and share them with any involved parties. The WKF are hoping MobApp will be adopted in in the future in Kenya by other agencies along the case referral pathway.

This study tested the efficacy of MobApp in preserving memory over time, and explored whether adapting the app to include questions that enable serial crimes to be linked lead to more comprehensive accounts from witnesses. Behavioural crime linkage (BCL) uses the principles of behavioural consistency and distinctiveness to identify patterns of behaviour across a series of crimes, which can then be attributed to a serial offender. Research has shown that this type of behavioural analysis can be used to successfully link multiple crimes committed by the same offender [9]. Therefore, we studied whether incorporating questions about the offender's behaviour increases the amount of information gathered from witnesses about offences, and the offender's behaviour in particular, which in turn can be used to facilitate the application of BCL. This is particularly important in low-resource environments like Kenya, because BCL enables investigators to solve crimes more efficiently, and thus, could prevent future crimes from occurring. In what follows, we provide an overview of (1) the Kenyan context and work being done by communities with respect to documenting sexual offences; (2) research on techniques that help prevent memory loss over time; and (3) research on the use of BCL to link serial crimes. Thereafter, the aims and an overview of the current study are presented.

1.1. Kenyan Context

Nearly 41% of women in Kenya have experienced physical or sexual intimate partner violence in their lifetime and nearly 26% have experienced it in the last 12 months [10]. Gender inequality is rampant in Kenya, which ranks 135th out of 159 countries on the Gender Inequality Index, a measure that indexes inequality between women and men in

reproductive health, empowerment, and labour market participation [11]. Further, sexual violence, which can be perpetrated against anyone, but most often is against women and girls, increases in Kenya in times of conflict, such as during postelection periods [12].

Poor data quality in Kenya makes sexual violence difficult to study. Researchers measure crime patterns using self-report surveys to gather information about incidents that, in many cases, happened long ago. Such data may not be accurate for a host of possible reasons, including forgetting, or respondents' fear of being judged, endangered, or penalised, which in turn leads to data incompleteness or inaccuracy [13]. As MobApp data is collected by human rights defenders, who are also trusted members of their communities, this potentially ameliorates some data validity concerns. For example, MobApp is widely distributed, and allows data to be gathered by survivors anonymously and relatively soon after the offence. Further, the data collected can be analysed in real time to identify emerging crime hotspots, which may prevent crime, as well as identify where vital services are needed.

1.2. Preventing Memory Failure

Best-practice interview techniques employ open-ended free recall prompts for eliciting statements from witnesses [14–16]. These prompts improve recall accuracy by allowing witnesses the opportunity to actively retrieve information from memory about the crime and freely report it using their own words. The WKF documents cases by prompting survivors to freely recall the crime. MobApp also includes specific questions about the perpetrator and the offence. Memory research suggests this may have a beneficial effect on survivors' ability to remember the crime over time during criminal investigations and judicial proceedings. This is vitally important in contexts where reporting to the authorities is often delayed (e.g., rural areas, times of conflict) and where the adjudication process is lengthy. In Kenya, crimes are seldom reported, and adjudications are rare, and as such, MobApp could turn the tide. Drawing on research about the vital role of an early interview in preserving memory [3], researchers recently found that allowing witnesses to write down their memories of a crime relatively soon afterwards preserves memory accuracy over time [3,17,18]. To our knowledge, there has been only one study investigating whether recalling a crime by recording it with a mobile application preserves memory. This app was developed by academic researchers in Australia, and they conducted an experimental investigation that found that research participants who used it to provide an initial account remembered more accurate information over time [19]. The present study sought to replicate and extend this previous research, working closely with the community Network.

1.3. MobApp and Behavioural Analysis

Kenya has a relatively low prosecution rate, particularly in cases of sexual violence, partly owing to resource constraints [20]. The use of a mobile application to gather information about an offender's behaviour could be a relatively low-cost, yet effective, method to gather intelligence about criminal perpetrators. This information could then be used to identify a behavioural pattern of offending across a series of offences based on an offender's *modus operandi* (MO), which allows for linking crimes committed by the same offender and more effectively identifying serial perpetrators. In the Global North, research has found that information about consistent and distinctive perpetrator behaviours established through the victim's description of the offence to the police can be used to link crimes committed by the same perpetrator [21,22]. More recent work indicates that these techniques are promising in the Global South in helping the police to solve serial offences [23,24]. While the use of BCL is the focus of this paper in terms of understanding how the information collected by witnesses could be used for the purposes of behavioural analysis, it is also worth noting that information about offending behaviour can also be used in other ways, such as implementing situational crime prevention strategies to protect communities [25], which uses offence data to identify high-risk circumstances and determine preventative

measures that may limit crime opportunities [26]. Mobile applications have previously been piloted in Kenya to gather data for situational crime prevention purposes with some success [8]; for instance, Oduor et al. (2014) found good will among the population to using apps to report crimes anonymously. For the interested reader, Aransiola and Ceccato (2020) provide further information about the use of modern technology for situational crime prevention, the exploration of which is beyond the scope of this paper [27].

In the present study, we investigated whether asking witnesses questions about the perpetrator's behaviour increases the total amount and accuracy of information reported about the crime. Specifically, drawing on *spreading of activation* theory, we hypothesised that when witnesses are asked to recall behaviourally relevant details about the perpetrator, it will strengthen their memory not only for behaviourally relevant details, but also for other aspects of the crime. Spreading of activation theory states that memories exist in networks [28]. When one node of the network is activated, it triggers the activation of other related information in memory. This leads to a strengthening of related memories. Therefore, we predicted that witnesses who are asked for behaviourally relevant information would recall more information about the perpetrator's behaviour and the crime overall than their counterparts.

1.4. Overview of Present Study

The present study investigated whether an immediate recall attempt made via MobApp or MobApp+ preserves memory accuracy over a one-week period in comparison to a control group. We used a mock-crime experiment paradigm wherein participant witnesses watched a mock-crime video and then had their memory of the crime tested one week later. This approach is appropriate for our purposes because it allows for measuring memory accuracy. A field test using real crime reports would not allow us to test our predictions because the accuracy of the witnesses' accounts could not be established as ground truth would be unknown. Our design included two intervention conditions and a control condition to which our participants were randomly assigned. Participants in our intervention conditions provided an initial account of the crime using either MobApp alone, or MobApp+, which is an enhanced version of MobApp that has the same questions as MobApp plus ones about the offender's behaviour before, during, and after the offence. Participants in the intervention conditions returned one week later to give another recall account of the crime. Participants in the control condition did not provide an initial account using an app, but rather recalled the crime for the first time one week later. The control group parallels usual practice in Kenya and other countries around the world with regard to sexual offences, whereby survivors frequently provide a delayed account to the police [3,4]. Our participants were recruited from the University of Birmingham in the United Kingdom (UK), owing to the pandemic and the urgent need to collect data quickly to inform practice in the field. Elections are occurring next year in Kenya, and MobApp, if it is effective, will be an especially important tool, considering that sexual violence increases during these periods [12]. Further tests in the field with the Network are planned using the outcome of this trial.

2. Methods

2.1. Design

We employed a 3-interview condition (MobApp, MobApp+, no initial recall) x 2 time point (immediate, one week) mixed design, with interview condition as the between groups factor, and time point as a within-subjects factor for those in the MobApp and MobApp+ conditions. Participants were randomly assigned to one of three initial interview conditions (MobApp, MobApp+, no initial recall). Participants in the MobApp condition answered questions immediately after the crime that would normally be asked of users of MobApp in Kenya. Those in the MobApp+ condition answered the same questions, but they were also asked questions about the offender's behaviour before, during and after the crime. Those

in the no initial recall condition did not have an interview immediately after the crime. All participants returned after a one-week delay and were asked to recall the mock crime.

The dependent variables included the total number of details recalled, recall accuracy rate, number of correct details recalled, number of incorrect details recalled, number of behaviourally relevant details (both correct and incorrect) recalled, recall accuracy rate of behaviourally relevant details, and confabulations (e.g., details not present or relevant to the mock-crime video), with the data conditioned on time point (immediate versus one-week later).

2.2. Participants

Participants (N = 90; M age = 21.84; SD = 5.46; age range 18–49 years; n = 64 female) were voluntarily recruited using University of Birmingham Sona Systems Research Participation Scheme (RPS, n = 66) and the online recruitment platform Prolific (n = 24). Participants were blind to their condition allocation (n = 30 participants per condition) and participants were either remunerated 2.5 course credits or £7.60 p/hr for their time. To be eligible to participate in the current study, participants had to be over the age of 17 and fluent in English. Ethics was obtained from the University of Birmingham's STEM Research Ethics Committee. All participants provided informed consent prior to study participation.

2.3. Procedure and Materials

Each participant completed the task independently, using the online survey platform Qualtrics. Participants were initially asked to provide demographic information regarding their age, gender, and ethnicity, before receiving written instructions that they were about to watch CCTV footage of a non-violent crime (the video was of a mock burglary). Participants were explicitly informed to pay careful attention to the video as they would be asked questions about it later. The video depicted a non-violent mock crime lasting 3 min and 43 s, where one man burglarised a house, taking household items (e.g., laptop and headphones) when no one was home. Burglary was considered an appropriate crime type to test our hypothesis, as it is less traumatic than sexual violence and many sexual violence crimes have been orchestrated in combination with burglaries [29]. The video was constructed to provide details relevant to BCL [30,31], as informed by Meenaghan et al. (2018) and Tonkin and Weeks (2021). To link crimes, analysts look for consistent and distinctive behaviours exhibited by the perpetrators when they select, enter, search, and exit a property. Thus, the video was constructed in a manner to provide details to recall in these areas (e.g., depicting the perpetrator carefully searching the property without destruction).

Following the video presentation, participants were provided instructions corresponding to their condition allocation. All participants initially completed a distractor task that asked them to count back in threes from 332 for 60 s.

2.3.1. Control Group

Following the distractor task, the control group were thanked for their participation and were reminded that there would be a follow-up session one week later.

2.3.2. MobApp

Within each recall survey, participants were instructed that they should provide an accurate account where possible, and to put "I don't know" if they were unsure to avoid guessing. Participants first completed a free recall text box, instructing them to recall what they saw in the video. No time or character limits were placed onto responses. They were then presented with questions from the WKF MobApp that has been adapted to be applicable for a burglary. Questions prompted the participant about any details they may not have remembered in the free recall. The seven questions asked participants what type of crime was portrayed in the video, what date and time of day they witnessed the event, where the event took place, if they knew the perpetrator, and how many perpetrators were involved.

2.3.3. MobApp+

The MobApp+ survey was the same as the MobApp survey but was extended to include behavioural items [30,31]. Like the MobApp condition, MobApp+ initially asked participants to freely recall what they could remember in a text box. Following the free recall responses, participants received 11 questions, asking them to describe the crime scene location, an estimate of the time of day of the incident, and whether any other witnesses were at the scene of the incident. The questions informed by BCL were split into three distinctive stages. The first stage included how the perpetrator selected and entered the target or property. These questions asked participants to describe the events in the order that they occurred, whether there was any evidence that the perpetrator was selecting a target or property, and how the perpetrator entered the property. The second stage referred to what occurred whilst the perpetrator was inside the property, committing the offence. Questions asked how the perpetrator located items they stole from the property, and how the perpetrator searched the property. The final stage of questions focused on how the crime scene was exited, whether there were any distinctive or memorable behaviours of the perpetrator, and if and how the perpetrator showed forensic awareness.

2.3.4. One-Week Recall

One week after their initial recall, participants were sent a follow-up survey link on Qualtrics. This survey asked them to freely recall what they could remember about the video they had previously witnessed into the text box provided. Participants completed their second recall task within 26 h of their original time slot. All participants were then thanked for their participation and debriefed, told the purpose of this study, and reminded they were able to withdraw their data within 72 h of participation.

2.4. Coding and Measures

Both time points (immediate, one week) were coded for the total number of correct and incorrect details as well as the total number of details recalled, recall accuracy rate (proportion of correct details recalled), number of confabulations, number of behaviourally relevant details recalled (correct and incorrect), and recall accuracy rate of behaviourally relevant details (proportion correct of the total number of behaviourally relevant details recalled).

Participants' recall was coded into details using a standardised template informed by prior research [32]. Recall was categorised into details pertaining to Action (A), Person (P), Object (O), or Setting (S). For example, in the mock-crime video, 'a white male leaving a property' was coded as: 'white (1-P) male (1-P) leaving (1-A) property (1-S)'. This would equate to four total details recalled. A sum of all details mentioned correct and incorrect formed a participant's total recall. Each detail was further coded for whether it was present within the mock-crime video (correct), was present within the mock-crime video and was not recalled correctly (incorrect), or was not present/relevant to the mock-crime video (confabulation).

What was considered a behaviourally relevant detail was informed by Meenaghan et al. (2018) and Tonkin and Weeks (2021), including behavioural details about how the perpetrator selected, entered, searched, and exited the property. A behaviourally relevant detail was defined as any information pertaining to an action the perpetrator committed or context to said action. For example, 'the man (1-P) rode off (1-A) on a bike (1-O)' was coded as three behaviourally relevant details. Subjective responses, such as 'house itself was worth a bit of money', were not coded.

2.5. Inter-Rater Reliability

To assess inter-rater reliability, 18 participant responses were randomly selected in each condition and coded independently by two researchers. Cohen's Kappa was computed for the measures displayed in Table 1. This analysis indicated acceptable levels of (moderate

to high) inter-rater reliability for each variable. Discrepancies were resolved through discussion prior to analysis.

Table 1. Cohen's Kappa Assessing Inter-Rater Reliability.

	Total Details			Behaviourally Relevant	
	Correct	**Incorrect**	**Confabulation**	**Correct**	**Incorrect**
Cohen's kappa (κ)	0.90	0.91	1.00	0.90	0.86
p-value	<0.001	<0.001	<0.001	<0.001	<0.001

Table note: A *p*-value < 0.001 indicates that the level of inter-rater agreement observed is different from what would be achieved by chance alone.

3. Results

3.1. Recall at One Week

Table 2 displays results of one-way ANCOVAs that were conducted to compare each dependent variable across conditions at one-week recall, using word count at one-week recall as a covariate to control for output. An ANCOVA compares the means across the conditions to assess whether they are statistically different, whilst controlling for a variable that may confound results (e.g., total amount of output in words). A significant main effect of recall accuracy rate by condition was found, $F(2, 43) = 3.79$, $p = 0.040$, $\eta^2 p = 0.07$. Participants in the MobApp+ condition demonstrated the highest recall accuracy rate, followed by the MobApp condition and the control condition with a medium effect size (see Table 2 for descriptive statistics).

Table 2. Descriptive and Inferential Statistics for One-Way ANCOVAs.

		Condition			*F*	*p*
		MobApp+	**MobApp**	**Control**		
One-Week Recall	Total Recall	35.17 (3.70)	37.53 (4.35)	33.20 (4.35)	1.18	0.312
	Correct Recall	33.83 (3.49)	35.80 (4.16)	30.53 (3.92)	2.28	0.109
	Incorrect Recall	1.33 (0.46)	1.73 (0.46)	2.67 (0.61)	3.30	0.042 *
	Accuracy Rate	0.97 (0.01)	0.92 (0.03)	0.85 (0.05)	3.79	0.040 *
	Behaviourally Relevant Accuracy Rate	0.96 (0.01)	0.93 (0.03)	0.84 (0.05)	2.59	0.068

* $p < 0.05$.

Orthogonal comparisons were conducted to compare the two MobApp conditions (MobApp and MobApp+) against the control condition, and to compare the two MobApp conditions against one another. These planned comparisons revealed a significant difference in recall accuracy rate between both MobApp and MobApp+ combined in comparison to the control group, $F(1, 87) = 5.32$, $p = 0.023$, $\eta^2 p = 0.06$. There was no significant difference in recall accuracy rate between MobApp and MobApp+ ($p = 0.170$). Therefore, participants given an initial interview had an increased recall accuracy rate in comparison to no initial recall at one-week final test (see Table 2).

A significant main effect of total number of incorrect details recalled by condition was obtained, $F(2, 86) = 3.30$, $p = 0.042$, $\eta^2 p = 0.07$, a medium effect size for condition (see Table 2 for descriptive statistics). Planned comparisons indicated a significant difference in the number of incorrect details recalled in the MobApp conditions combined in comparison to the control condition, $F(1, 87) = 6.65$, $p = 0.012$, $\eta^2 p = 0.07$. There was no significant difference in the number of incorrect details recalled between MobApp+ and MobApp ($p = 0.784$). Therefore, an initial recall attempt reduced the number of incorrect details recalled at one-week final test. For all other inferential statistics and descriptive statistics refer to Table 2.

3.2. MobApp Conditions Compared: Recall over Time

Additional analyses examined whether being questioned about the behaviour of the offender within the phone application increased the recall accuracy rate of reporting or the number of correct details recalled one week later. We conducted mixed ANCOVAs (2 time point × 2 MobApp interview conditions) for all dependent variables, with word count for each time point entered as covariates; results are displayed in Table 3. A mixed ANCOVA compares whether the means differ between conditions and/or across the two time points, as well as whether the use of MobApp differentially affects recall performance depending on delay.

Table 3. Descriptive and Inferential Statistics for Repeated-Measures ANCOVAs on each of the Dependent Variables.

	MobApp	**MobApp+**	**Condition**	**Time**	**Condition × Time**
Total Recall					
Immediate Recall	47.93 (4.51)	78.10 (6.46)	$F(1,56) = 0.68$ ns	$F(1,56) = 9.76$ **	$F(1,56) = 0.00$ ns
One-Week Recall	37.53 (4.35)	35.17 (3.70)			
Correct					
Immediate Recall	45.90 (4.35)	75.73 (6.27)	$F(1,56) = 0.13$ ns	$F(1,56) = 8.32$ **	$F(1,56) = 1.41$ ns
One-Week Recall	35.80 (4.16)	33.83 (3.49)			
Incorrect					
Immediate Recall	2.03 (0.49)	2.37 (0.45)	$F(1,56) = 1.19$ ns	$F(1,56) = 4.26$ *	$F(1,56) = 2.58$ ns
One-Week Recall	1.73 (0.46)	1.33 (0.46)			
Accuracy Rate					
Immediate Recall	0.96 (0.01)	0.97 (0.01)	$F(1,56) = 2.45$ ns	$F(1,56) = 1.13$ ns	$F(1,56) = 0.36$ ns
One-Week Recall	0.92 (0.03)	0.97 (0.01)			
Behaviourally Relevant Accuracy Rate					
Immediate Recall	0.96 (0.01)	0.97 (0.01)	$F(1,56) = 1.78$ ns	$F(1,56) = 2.04$ ns	$F(1,56) = 0.13$ ns
One-Week Recall	0.93 (0.03)	0.96 (0.01)			

* $p < 0.05$. ** $p < 0.01$.

Significant main effects of time were found for total details recalled ($F(1, 56) = 9.76$, $p = 0.003$, $\eta^2p = 0.15$), total correct details recalled ($F(1, 56) = 8.32$, $p = 0.006$, $\eta^2p = 0.13$), and total incorrect details recalled ($F(1, 56) = 4.26$, $p = 0.044$, $\eta^2p = 0.07$), with mean recall decreasing over time. Thus, both the number of correct and incorrect details recalled decreased as a function of time. No significant main effects of time were found for the recall accuracy rate, or for the recall accuracy rate of behaviourally relevant details. No significant main effects of condition or interaction effects were found for any of the dependent variables. Therefore, the two versions of MobApp were comparable regarding recall across time points.

4. Discussion

We tested whether MobApp, a mobile application pioneered by a community Network in Kenya to document crimes, slows the rate of forgetting. We found that a recall attempt given immediately after witnessing a mock crime using MobApp or MobApp+ preserved the memory recall accuracy rate over a one-week period and led to increased recall accuracy in comparison to a control group. These findings are vitally important, as they indicate that MobApp can preserve memory recall over time. Memory preservation can improve the ability of survivors in communities with low resources to access justice. This is the first study to evaluate the efficacy of MobApp as a tool that preserves memory over time and that elicits information about the suspect's behaviour for BCL purposes. Next, we will discuss these findings in turn.

4.1. Memory Preservation over Time

Regardless of whether MobApp included prompts for the survivor to report information about the perpetrator's behaviour, the recall accuracy rate did not decrease over time. Recall accuracy was high immediately after the crime and one week later for those who used MobApp to give an immediate initial account. This finding is in line with previous research findings that an early initial recall attempt preserves memory accuracy across time [3,19]. Ours was the first study to extend these findings to the Kenyan community initiative MobApp. Previous research has found that participants are frequently accurate when they can freely recall details [33]. We found that an initial recall attempt using the community driven MobApp or the modified MobApp+ preserved recall accuracy rates across time, which means in practice that the community can use MobApp to gather accurate and essential details that can further investigations and prosecutions.

While the rate at which participants were accurate did not decrease over time for those who used the mobile application, the total number of details recalled did decrease over time. Specifically, participants in the MobApp condition and the behaviourally enhanced MobApp+ condition recalled more details in total (both correct and incorrect) in their initial recall attempt compared to one week later. These results do not replicate what is typically found in research on the benefit of an early initial recall attempt [3,34]. Previous research has found that participants who gave an early initial recall account maintain a similar number of total details recalled at initial test and final test [3,34]. The current research may not have replicated these findings for several reasons. First, over the one-week delay period, participants may have become increasingly stringent about the memories they reported, which in turn served to decrease the amount of information they reported, and this helped them maintain accuracy over time [33]. Put differently, witnesses may apply a strict reporting criterion, which preserves accuracy, but this comes at the expense of the completeness of the account [35]. Alternatively, the initial recall test prompted participants to freely recall the crime, and then prompted participants to recall information about the perpetrator's behaviour. In contrast, the final recall test included only a free recall prompt. This may have suggested to participants to report the same information as they had reported on the initial free recall account, leading them to leave out behavioural details on the final test that they would have reported had they been prompted for it.

Finally, this research had to be conducted using online survey platforms owing to the pandemic-related UK stay at home orders. This limited our ability to establish rapport with our participants, which is important in making people feel comfortable and motivated to disclose information [36]. On the ground in Kenya, a member of the Network collects the survivor's testimony in person using MobApp. As a result of this they can establish rapport with the survivor, which may lead to a greater number of details being disclosed than if the data were collected online.

We found that MobApp and MobApp+ led to a higher rate of recall accuracy one week later in comparison to the control group, which did not have an initial recall attempt. The control group represents the situation in most countries, wherein survivors of violence often delay their reporting to the police. Our work shows an initial recall attempt using a mobile application immediately after the crime can preserve accuracy, which is vital if survivors elect to report to the police after a delay. Participants in the MobApp+ condition did have the highest accuracy rates on average, albeit this difference was not statistically significant. Thus, we tentatively conclude that MobApp+ may potentially lead to the highest rate of accuracy over other known approaches when used by community actors documenting incidents of violence.

4.2. Behaviorally Relevant Details

The use of the mobile applications also led to increased recall accuracy for behaviourally relevant details compared to the control condition, although the difference was not statistically significant. Given these results, we would encourage community organisations to prompt survivors for behaviourally relevant details. First, doing so does not decrease accu-

racy. Second, behaviourally relevant details can be used to link crimes together, helping to provide evidence and aid investigations to bring serial offenders to apprehension, thus preventing further offences [21–24]. Additionally, and as noted above, behaviourally relevant details can also be important for other types of analyses, such as indicating geographical and temporal crime patterns to inform situational crime prevention strategies. In contexts such as Kenya, where there are limited resources, this information may be strategically important for developing preventative measures, such as increased police or community surveillance at certain times or in certain locations [37].

4.3. Limitations and Future Directions

We need to learn more about the experiences of communities who are using mobile applications to document crimes and in wide ranging contexts. The present study was necessarily limited to an experimental paradigm that tested people's ability to remember a mock crime over a one-week period. In real world cases there are often delays of months or years in between reporting [3,4]. Further, the witnesses' duration of exposure to the culprit in real world crimes, including rape, is relatively long compared to the exposure time used in the present study [38]. Delay and duration of exposure can affect how strong the witness' memory is of the crime. However, there is no theoretical reason to expect that remembering would be better in the control compared to the MobApp conditions depending on memory strength. Further, under conditions where memory is initially exceptionally weak, or exceptionally strong, using an app would have less of an effect on preserving memory over time.

MobApp is used predominantly in Kenya to document cases of SGBV. However, for ethical reasons, the mock crime we used was not an incident of SGBV. There has been debate about the impact of traumatic events (e.g., SGBV) on memory, with some researchers concluding that incidents of trauma are remembered less vividly than other types of events [39], while others maintain that traumatic events are remembered in greater detail than other events [40]. Nevertheless, all other things being equal, we know of no theoretical reason why trauma would diminish the benefits of an early interview in preserving memory.

Additionally, whilst the current study did not investigate memory for SGBV within a Kenyan sample, the results likely generalise to Kenyans. The effect of an initial recall attempt has been found in several countries (e.g., Spain, Mexico, the Netherlands, Australia) [41]. Therefore, there is good reason to expect that the findings generalise to people in Kenya. Finally, in Kenya, MobApp provides an opportunity to amplify survivors' voices. Survivors are often silenced by the culture of stigma and shame surrounding SGBV in Kenya [42], and this frequently leads to survivors not reporting these crimes to the police. For survivors who do decide to report, the quality of their statements given to the police may be compromised because the police have insufficient resources to support the training of officers to conduct interviews using evidence-based practice [8]. In Kenya, the forms used to record the crime include little space to record the survivor's account. Further, a culture of impunity that silences many victims currently reigns in Kenya [43]. Thus, an ongoing issue is the need to enable survivors to report in an effective manner the crimes that occur against them. The Network members are trusted within their communities, and this leads to increased disclosure [44,45]. Therefore, providing Network members with a tool that documents cases and preserves recall accuracy over time is a positive development.

The use of human rights defenders to document incidents of SGBV in Kenya helps to overcome some of the obstacles that preclude survivors from accessing a mobile application. In Kenya, currently 18% of the population are illiterate [46]; thus, it is crucial in many cases that a Network member is available to aid in the documentation the case. MobApp currently does not handle voice recordings, and even if it did, this would require additional data usage, which would be expensive and cost prohibitive for many people in Kenya. Whilst almost everyone in Kenya owns a mobile device, only an estimated 40% have access to the Internet [47]. Therefore, arming human rights defenders with mobile devices to docu-

ment the survivor's account is essential. Our current research is evaluating methods to train communities using MobApp to document cases using best-practice interview techniques. This is critical because community organisations are often the first responders and the ones to obtain the survivor's account. The quality of an initial account plays a crucial role in case progression and criminal justice proceedings [48,49]. If the account is taken using best practice, this can increase the likelihood of a successful prosecution. This research is vital because research has found that it is difficult to conduct an interview, even when interviewers have specialist training [50]. In view of this, our current co-developed research agenda seeks to build the capacity of the WKF to document cases through sustainable training packages that are freely available and instil best-practice interview techniques using a survivor-centred approach that seeks to minimise re-traumatisation during the process.

Finally, the use of mobile applications by communities to document crimes is likely to rise, particularly in the times of COVID-19, wherein police stations can be even harder to reach owing to lockdowns and curfews [44]. Thus, research on the impact of such apps on memory accuracy is critical. There is evidence to suggest that communities are receptive to using apps like MobApp. In Kenya, Oduor et al. (2014) examined the use of mobile applications as a tool for situational crime prevention. The mobile application they investigated allows users to receive crime updates, report crimes, search for lost friends, contact the police, and locate crime hotspots. Mobile applications of this kind may be particularly important in contexts like Kenya, wherein survivors may be reluctant to report sexual offences to the police owing to fear and stigma, or because they cannot travel to a police station. In Oduor et al. (2014), participants reported that they would likely use an app to report crime, as it enables reporting of the incident anonymously without the need to go to the police station. Given this context, MobApp may prove to be especially valuable.

5. Conclusions

We found that MobApp can preserve recall accuracy over a one-week period. This community-developed tool is also effective in the documentation of information about the perpetrator's behaviour, which can be vital in linking serial crimes. Our results are promising for low-resource contexts like Kenya, where communities are seeking to document crimes to illustrate and understand the nature of the violations that are occurring. Our research indicates that MobApp preserves memory accuracy over time, which is vital considering that crimes are infrequently reported, and that among those that are reported, there is often a long delay between the crime and adjudication.

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Data Availability Statement: Data can be found here: https://osf.io/47ct8/?view_only=08c633da979b4dfa961ad488817c97cc (accessed on 13 January 2022).

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