Social media-induced secondary traumatic stress: Can viewing news relating to knife crime via social media induce PTSD symptoms

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There have been recent increase in reported knife crime throughout the United Kingdom, while social media usage has also increased. Existing research has reported associations between social media usage and secondary traumatic stress (STS), with symptoms similar to that of posttraumatic stress disorder (PTSD). The current study is the first to investigate the relationship between the frequency of viewing knife crime-related news via social media and STS. This study additionally investigated potential moderating effects of gender, age, and residential location. Participants (N = 155) completed an online survey which included the Secondary Traumatic Stress Scale (STSS), modified to refer to knife crime. Participants also self-reported the frequency of viewing knife crime on social media and relevant demographic information. Hypotheses and data analysis plan were pre-registered. 63% of participants reported STS symptoms, and 28% reported possible clinical levels of PTSD. A higher frequency of knife crime viewed via social media was significantly associated with higher STS symptoms, and this study found evidence that this effect is moderated by residential location, with those participants living in towns and villages most at risk. Younger, female participants scored highest on the STSS overall. It is important to understand the impact of viewing knife crime content via social media on mental health, and identification of those most at risk of experiencing STS will enable targeted intervention strategies.

Keywords: knife crime; posttraumatic stress disorder; secondary traumatic stress; sex differences; social media

Prior to the COVID-19 outbreak, knife crime in the UK was described as 'a different sort of epidemic' (Shaw, 2020). In 2019, there were 45,627 incidents of knife crime in England and Wales; the highest on record and 49% higher than 2011 (when comparable records began). Knife crime also accounted for almost half (44%) of 'assault with injury and assault with intent to cause serious harm' offences in 2019 (Office for National Statistics [ONS], 2020). The issue of increased knife crime created widespread alarm (Harding, 2020), resulting in a national campaign to recruit 20,000 more police officers to specifically address this issue (Gov.uk, 2019).

The rise in knife crime has also resulted in an increase in media coverage of this subject, especially on social media (Grimshaw & Ford, 2018). Nearly half (49%) of individuals in the UK use social media for news, with Facebook used the most, followed by Twitter and WhatsApp (Ofcom, 2019). There is evidence that media outlets are responding to the changes in consumer viewing with journalists changing the way that news is reported to fit in with viewing on social media platforms (Lasorsa et al., 2012). However, the shift to viewing news via social media has not only led to vast amounts of available information, but it has also increased the accessibility of unreliable sources (Flintham et al., 2018). This has led to the increase of exaggerated information and fake news on social media with journalists and the public, using shocking headlines, false information and graphic images/videos to gain popularity (Shu, 2017). Furthermore, social media algorithms are designed to show users content related to items they have already viewed (Eslami et al., 2015). This can result in disproportionate overrepresentation of certain issues, such as knife crime, leading to exaggerated fear/panic. Before the use of social media, most access to news reporting was via newspapers and live TV/radio. Exposure was therefore limited to certain times a day, with much of the day spent isolated from it. In contrast, social media now enables exposure to world news throughout the day, resulting in adverse effects on well-being and the creation of a 'fear culture' (Hardie, 2016). These effects may be exacerbated further as some sources can include graphic videos and images which social media platforms may struggle to remove (Wayne, 2016).

Following the 9/11 Twin Towers attack, research highlighted the psychological impact of viewing tragic events indirectly, such as on TV. Many people reported symptoms of posttraumatic stress disorder (PTSD) specifically related to viewing images of the terrorist attack via news channels (Neria et al., 2011). There was also a positive association between the time spent watching news about the 9/11 attack and the severity of the PTSD symptoms (Ahern et al., 2004; Schlenger et al., 2002). This phenomenon is defined as 'secondary traumatic stress (STS) ', also referred to as 'vicarious traumatisation' and 'compassion fatigue' and was first described by Figley (1983) as stress resulting from helping others who are suffering or traumatised (Figley, 1999). He stated that individuals who are in contact with trauma survivors, such as individuals working with traumatised clients, may mirror symptoms of PTSD (Bride et al., 2004; Figley, 1995). Furthermore, Figley (1999) proposed STS as being equivalent to PTSD, with symptoms categorised with levels of intrusion, avoidance and arousal. The American Psychiatric Association [APA] (2013) defines 'intrusion' as repeated intrusive thoughts or flashbacks of the event, 'avoidance' as actively avoiding reminders of the event which may include not going to a particular place or seeing certain people and 'arousal' as bodily reactions such as problems with sleeping or experiencing angry outbursts.

Due to digitalisation and the shift towards social media becoming a popular source of news (Ofcom, 2020; Swart et al., 2016), recent research has focused on the association between social media and STS. An example of this is Ramsden (2015) who reported that nearly one-quarter of their participants scored high on clinical measures of PTSD as a result of viewing violent news such as 9/11 Twin Tower attack, school shootings and suicide bombings via social media. Additionally, participants who reported viewing the events more frequently were most affected (Ramsden, 2015). Similarly, Comstock and Platania (2017) investigated the effect of STS induced by the media (TV and social media) on perceptions of distress. Comstock and Platania (2017) found that nearly one-quarter of participants reported being significantly affected by adverse events viewed on social media, with the amount of stress reported relating to how often participants viewed the event. Ramsden (2015) and Comstock and Platania (2017) demonstrate that increased frequency of traumatic posts viewed on social media may exacerbate psychological and social anxieties, as well as symptoms of PTSD/STS. Therefore, there is a need to increase awareness of the damaging and dangerous risks of frequently viewing often unedited and graphic news via social media, and that appropriate support is made available for those who need it (Comstock & Platania, 2017; Intravia et al., 2017; Ramsden, 2015).

Building on previous research, the current study aims to examine the association between frequency of knife crime viewed on social media and STS, and test for moderating effects of age, gender and place of residence. It is important to test for possible moderating effects by demographic factors, as media consumption, and psychological impacts, can differ amongst individuals (Intravia et al., 2017). Previous research has consistently demonstrated that women are at greater risk of PTSD than men (Christiansen & Hansen 2015; Irish et al., 2011; Olff, 2017). However, there has been little research on sex differences in secondary traumatisation (Baum, 2014), and it is currently unknown whether viewing knife crime via social media may induce sex-specific STS

symptoms. There is evidence that teenagers and young adults are becoming more anxious and have negative views towards society, which has been linked to greater social media use (Booth, 2019; Brooks, 2015; Ofcom, 2020; Vannucci et al., 2017). These findings could be explained by the fact that younger individuals use social media more frequently and are therefore more regularly exposed to negative content (Ofcom, 2020; Scott, 2017). Place of residence will also be examined as a moderating variable as violence tends to be concentrated in metropolitan areas and past research has reported that prevalence of probable PTSD after the 9/11 attack was significantly higher in metropolitan areas across the UK (ONS, 2020; Schlenger et al., 2002). Finally, the subscales of the Secondary Traumatic Stress Scale (STSS) will be considered individually, as the different subscales are associated with various symptoms, reflective of the PTSD diagnosis (APA, 2013). We made the following hypotheses:

Hypothesis 1 (H1): Individuals who view more information regarding knife crime via social media will score higher on the Secondary Traumatic Stress Scale than those who view it less frequently.

Hypothesis 2 (H2): Individuals who view more information regarding knife crime on social media will score significantly higher on the intrusion and avoidance subscales, but not the arousal subscale, compared with those who view it less frequently.

Hypothesis 3 (H3): Women who view more information regarding knife crime on social media will score higher on the Secondary Traumatic Stress Scale compared to men.

Hypothesis 4 (H4): Younger individuals who view more information regarding knife crime on social media will score higher on the Secondary Traumatic Stress Scale than older individuals.

Hypothesis 5 (H5): Individuals who live in heavily populated areas (e.g,, cities) that view more information regarding knife crime on social media will score higher on the Secondary Traumatic Stress Scale than those who live in less populated, more rural areas.

METHODS

Participants

Participants were adults who completed a cross-sectional, online survey hosted by Qualtrics during July 2020. Potential participants were required to be social media users, fluent in English, UK-based, aged 18 years or over, and have the capacity to consent. Individuals with a previous clinical PTSD diagnosis were excluded. Participants were recruited via an opportunistic sampling method to an online survey advertised on the social media platforms Linked-In and Twitter. Manchester Metropolitan University's Participant Pool Scheme and word of mouth was also used to recruit potential participants. A sample size calculation was conducted using G*Power Software V3.1.9.7 which indicated that a sample of 138 participants would be sufficient to detect a small effect size (f^2 = 0.15), at 95% power, accepting a p-value of .05 as significant. 238 participants initially completed the survey; however, 61 were removed due to incomplete data. Data from an additional 27 participants was removed because they met criteria for exclusion (previous clinical PTSD diagnosis, and/or selected 'none' on the frequency of knife crime posts viewed on social media). The final sample (N = 155) consisted of 125 females and 30 males aged 18–78 years (M = 34.19, SD = 14.39). All participants gave informed consent, and the study was reviewed and approved by Manchester Metropolitan University Research Ethics Committee.

Design

The online survey consisted of 27-items. The independent variables were age, gender, place of residence (categorised into city, town and village) and frequency of knife crime viewed on social media. The dependent variables (DV) were the overall STSS score, and the STSS subscale scores: intrusion, avoidance and arousal (Bride et al., 2004). The survey and supporting documents are available to view and download (https://osf.io/6n5a9).

Measures

Social media usage. Participants were required to respond to questions about how much time they spend on social media (How much time do you spend on social media per day? Less than 30 minutes = 1/30–60 minutes = 2/1–2 hours = 3/2–3 hours = 4/3+ hours = 5), and how often they see content relating to news/knife crime on social media (How often do you see posts relating to news on social media? Always/Very

often/Sometimes/Rarely/Never. Approximately over the past 12 months how many times have you seen posts (videos/photos/news) related to knife crime on social media? None/1–3/6-6/7–10/11+).

Secondary Traumatic Stress Scale (STSS). Participants completed a 17-item-self-report questionnaire with three subscales: intrusion, avoidance and arousal, which was originally designed to assess levels of STS in working professionals (Bride et al., 2004). Participants were asked to read a statement and rate how frequently the statement is true for them on a five-point scale from 'never ' to 'very often '. A high score indicates a high level of STS. The STSS was modified for this study with the wording of the instruction and questions altered to reflect knife crime viewed on social media rather than 'client exposure '. The STSS is a standard tool used for measuring STS and is used internationally (Jacobs et al., 2019). It possesses good psychometrics showing good overall reliability (Cronbach 's α = .93) and for the subscales (Intrusion α = .80, Avoidance α = .87 and Arousal α = .83) (Bride et al., 2004; Roden-Foreman et al., 2017). Furthermore, Bride et al. (2004) provide evidence of the scale′s convergent, discriminant and factorial validity. Previous research has also found the scale to achieve good levels of factor intercorrelations, internal consistency reliability and validity (Badger et al., 2008; Benuto et al., 2018; Dominguez-Gomez & Rutledge, 2009; Mirsaleh et al., 2014;).

Confounders. Participants self-reported their highest educational qualification, and the social media platform most commonly used when news related to knife crime was viewed. These variables were included in the main analyses as confounders.

Data analysis

First, the distribution of the variables was examined, and descriptive statistics reported. The STSS subscales were created by summing the items which corresponded with each subscale, and the total STSS score was a sum of all the items. To address the hypotheses, four multiple linear regressions were conducted with the total STSS score, and each subscale, entered as the dependant variables. The following variables were entered in a step-wise fashion. Step 1: highest educational qualification and social media platform most frequently used were entered as confounders. Step 2: the main predictor variables (age, gender, place of residence, and frequency of knife crime viewed on social media) were entered. Lastly, at step 3, the interaction variables (frequency of knife viewed on social media X gender/age/location) were entered. The interaction variables were created using centred and standardised variables to avoid multicollinearity. Main effects and interactions are reported along with 95% confidence intervals (CI) and *p*-values. All data were analysed using the Statistical Package for the Social Sciences 26 (SPSS), and the data analysis plan and hypotheses were pre-registered (https://osf.io/6n5a9).

RESULTS

Summary descriptive statistics for the sample, and split by gender, are displayed in Table 1. 63.23% of participants indicated some level of STS and 9.68% showed severe STS levels.

Tests of assumption were conducted using histograms and skewness statistics, which showed normally distributed data with some slight skewness for gender and the STSS total score and subscales. Initial regressions were performed, and diagnostic data was saved. From examining the scatterplot of residuals, two data points were found to be more than 3 *SD*s from zero for each outcome. The data met the assumption of no multicollinearity evidence from the variance inflation factor and tolerance scores (Daoud, 2017). Although there is a violation assumption of no outliers, it was decided that the data would not be transformed as the skewness was only slight and the costs of transformation do not outweigh the benefits in this case (Siegel, 2016).

Total STS score

The first regression examined predictiveness of the variables on total STS scores (see Table 2). Step 1 showed the covariates to account for 1% of the variance in STS scores (Adjusted R^2 = 0.01). Including the main predictors at step 2 significantly improved the model fit (F_{change} = 7.88, p < .001), adding 15.9% to the prediction of STS scores which in total explained 16% of variance in STS scores (Adjusted R^2 = 0.16). According to Cohen′s (1988) conventions, this is considered a medium effect size. However, adding the interaction variables at step 3 did not significantly improve the model fit (F_{change} = 1.31, p = .275). Overall, the three-step model was significant, (F(9, 145) = 4.32, p < .001) but showed a larger f-value with the 2-step model (F(6, 148) = 5.79, p < .001). The results indicated that frequency of knife crime viewed on social media was positively associated with STS scores (β = 0.21, p = .014), indicating that those who spend more time viewing knife crime related news on

social media reported higher STS scores. Gender was also associated with STS scores (β = 0.21, p = .007), and further examination of the data revealed that women scored higher on the STSS (M = 34.21, SD = 11.71) than men (M = 27.20, SD = 7.24). There was a negative association between age and STSS score, indicating that younger participants reported higher STS symptoms (β = -0.33, p < .001). There was no association between place of residence and STS scores. At stage 3, none of the interaction variables were associated with STSS scores.

Table 1. Demographic Characteristics and Secondary Traumatic Stress Scale Scores of the sample

	All sample N = 155	Females N = 125	Males N = 30
Age: M *(SD)*	34.19(±14.19)	33.45(±14.37)	37.27(±14.31)
Education level: n *(%)*			
No formal education	1 (0.60)	1 (0.80)	0 (0.00)
Entry-level functional skills	1 (0.60)	0(0.00)	1 (3.30)
Secondary Education	20 (12.90)	15 (12.00)	5 (16.70)
Post-Secondary Education	52 (33.50)	40 (32.00)	12 (40)
Undergraduate Degree	61 (39.40)	54 (43.20)	7 (23.30)
Postgraduate Degree	19 (12.30)	14 (11.20)	5 (16.70)
Doctorate (PhD)	1 (0.60)	1 (0.80)	0 (0.00)
Place of residence: *n (%)*			
City	34 (21.90)	28 (22.40)	6 (20.00)
Town	92 (59.40)	73 (58.40)	19 (63.3)
Village	29 (18.70)	24 (19.20)	5 (16.70)
Frequency of knife crime viewed on social media in the past 12 months: n *(%)*			
1-3	39 (25.2)	29 (23.2)	10 (33.3)
4-6	50 (32.3)	42 (33.6)	8 (26.7)
7-9	14 (9)	12 (9.6)	2 (6.7)
10+	52 (33.5)	42 (33.6)	10 (33.3)
Total STSS: m (SD)	32.85 (±11.32)	34.21(±11.71)	27.20(±7.24)
Intrusion Subscale Score, m (SD)	10.12(±3.65)	10.62(±3.74)	8.07(±2.38)
Avoidance Subscale Score, m (SD)	13.40(4.37)	13.81(±4.50)	11.70(±3.35)
Arousal Subscale Score, m (SD)	9.33(±4.12)	9.78(±4.29)	7.43(±2.65)

KC = knife crime, SM = social media

STS intrusion subscale score

The second linear regression explored the association between the variables of interest and intrusion scores (*see Table 3 for results).* Step 1 accounted for 2% of the variance in intrusion scores (Adjusted R^2 = 0.02), adding the main predictors at step 2 significantly improved the model (F_{change} = 8.84, p < .001) explaining 19% of variance (Adjusted R^2 = 0.19) showing a medium effect size (Cohen, 1988). However, adding the interaction variables at step 3 did not significantly improve the model (F_{change} = 1.41, p = .242). The model as a whole was significant (F(9,145) = 5.08, p < .001) and, as for the total STSS score, frequency of knife crime viewed on social media (β = 0.17, p = .044), gender (β = 0.24, p = .001) and age (β = -0.33, p <.001) were associated with intrusion scores. There was no association between place of residence and STS scores.

At step 3 there was a significant interaction between frequency of knife crime viewed via social media and place of residence on intrusion scores (β = -.15, p = .047). Further exploration of the data revealed a small significant correlation between frequency of viewing knife crime on social media and intrusion score for those participants living in a town (r = .25, p = .018) and a village (r = .39, p = .037). There was no association between frequency of viewing knife crime on social media and STSS score for those participants living in a city.

Table 2. Summary of Multiple Linear Regression Analysis for Total STSS Scores and Measured Variables

	Total STS Scores			
Predictor variables	***B***	**β**	***t***	***p***
Step 1				
Education level	−0.07	-0.01	-0.07	.946
KC news platform	0.85	0.13	1.64	.104
Step 2				
Age	−3.69	-0.33	-4.11	<.001**
Gender	2.94	0.21	2.73	.007*
Place of residence	1.06	0.06	0.78	.436
KC SM Frequency	2.81	0.21	2.49	.014*
Step 3				
KC SM Frequency X age	-0.52	-.04	-0.51	.613
KC SM Frequency X gender	0.03	0.002	0.03	.98
KC SM Frequency X POR	3.04	0.15	1.96	.052

Note: $N = 155$, data from participants scores on the Secondary Traumatic Stress Scale. KC = knife crime, SM = social media. *$p < .05$, ** $p < .001$.

Table 3. Summary of Multiple Linear Regression Analysis for Intrusion Subscale Scores and Measured Variables

	Intrusion Subscale Scores			
Predictor variables	***B***	**β**	***t***	***p***
Step 1				
Education level	0.05	0.01	0.17	.868
KC news platform	0.37	0.18	2.19	.03*
Step 2				
Age	−1.22	−0.33	−4.28	<.001**
Gender	1.11	0.24	3.25	.001*
Place of residence	0.41	0.07	0.95	.344
KC SM Frequency	0.73	0.17	2.03	.044*
Step 3				
KC SM Frequency X age	−0.15	−0.04	−0.47	.643
KC SM Frequency X gender	0.14	0.03	0.36	.719
KC SM Frequency X POR	0.99	0.15	2.01	.047*

Note: $N = 155$, data from participants scores on the Secondary Traumatic Stress Scale. KC = knife crime, SM = social media. *$p < .05$, ** $p < .001$.

Table 4. Summary of Multiple Linear Regression Analysis for Avoidance Subscale Scores and Measured Variables

	Avoidance Subscale Scores			
Predictor variables	***B***	**β**	**t**	***p***
Step 1				
Education level	−0.08	−0.02	−0.22	.829
KC news platform	0.19	0.08	0.92	.361
Step 2				
Age	−1.04	−0.24	−2.86	.005*
Gender	0.88	0.16	2.02	.045*
Place of residence	0.37	0.05	0.67	.507
KC SM Frequency	0.97	0.18	2.11	.036*
Step 3				
KC SM Frequency x age	−0.16	−0.03	−0.38	.702
KC SM Frequency x gender	−0.19	−0.04	−0.37	.711
KC SM Frequency x POR	1.26	0.16	2.01	.047*

Note: $N = 155$, data from participants scores on the Secondary Traumatic Stress Scale. KC = knife crime, SM = social media. *$p < .05$, ** $p < .001$.

Table 5. Summary of Multiple Linear Regression Analysis for Arousal Subscale Scores and Measured Variables

	Arousal Subscale Scores			
Predictor variables	*B*	β	*t*	*p*
Step 1				
Education level	−0.04	−0.01	−0.10	.920
KC news platform	0.30	0.13	1.59	.114
Step 2				
Age	−1.43	−0.35	−4.38	< .001**
Gender	0.95	0.18	2.44	.016*
Place of residence	0.29	0.04	0.58	.564
KC SM Frequency	1.12	0.23	2.72	.007*
Step 3				
KC SM Frequency x age	−0.21	−0.44	−0.56	.576
KC SM Frequency x gender	0.08	0.02	0.17	.868
KC SM Frequency x POR	0.79	0.11	1.40	.164

Note: N = 155, data from participants scores on the Secondary Traumatic Stress Scale. KC = knife crime, SM = social media. *p < .05, ** p < .001.

STS avoidance subscale score

The third linear regression explored the association between the variables with avoidance scores (*see Table 4 for results).* The covariates at step 1 accounted for 0% of the variance in avoidance scores (Adjusted R^2 = -0.01), adding the main predictors at step 2 improved the model (F_{change} = 4.26, p = .003 accounting for 7% (Adjusted R^2 = 0.07) showing a small effect size (Cohen, 1988). However, adding the interaction variables at step 3 did not significantly improve the model (F_{change} = 1.39, p = .249) but the whole model was statistically significant (F(9,145) = 2.49, p = .011). Frequency of knife crime viewed on social media (β = 0.18, p = .036) and gender (β = 0.16, p = .045) were associated with avoidance. There was no association was between age or place of residence and avoidance scores.

There was a significant interaction between frequency of knife crime viewed through social media and place of residence on avoidance scores (β = 0.16, p = .047). Further analysis revealed that for those participants who lived in a village, there was a positive correlation between frequency of knife crime viewed on social media and avoidance scores (r = .45, p = .015).

STS arousal subscale score

The final linear regression tested the association between the variables and arousal scores (*see Table 5 for results).* Step 1 accounted for 0.4% of the variance in intrusion scores (Adjusted R^2 = 0.004), step 2 significantly improved the model (F_{change} = 8.23, p = < .001) explaining 16% of variance (Adjusted R^2 = 0.16), showing a medium effect size (Cohen, 1988). Step 3 however, did not significantly improve the model (Adjusted R^2 = 0.16, F_{change} = 0.72, p = .54). The overall model was statistically significant (F(9,145) = 4.22, p < .001) with frequency of knife crime viewed on social media (β = .23, p = .007), gender (β = 0.18, p = .016) and age (β = −0.35, p <.001) associated with arousal scores. There was no association between place of residence and arousal scores. Additionally, none of the interaction variables at Step 3 were associated with the arousal subscale.

DISCUSSION

This study examined the association between the frequency of viewing posts relating to knife crime on social media and levels of STS, and investigated the potential moderating effects of gender, age and place of residence. As hypothesised, participants who viewed more information relating to knife crime through social media scored higher on the STSS (H1). This finding supports previous literature, which reported that frequency of viewing tragic events through social media significantly increases the prevalence of STS/PTSD symptoms (Ahern et al., 2004; Comstock & Platania, 2017; Ramsden, 2015; Schlenger et al., 2002;). The results of the current study extend existing findings by showing that this trend can specifically apply to knife crime viewed on social media and levels of STS. We further investigated the impact of viewing knife crime related news on the STSS subscales: arousal, intrusion and avoidance. Contrary to our hypotheses, frequency of knife crime viewed on social media was most strongly associated with arousal scores, followed by intrusion and then avoidance scores (H2). This suggests that participants most commonly experienced symptoms within the arousal subscale, which includes bodily reactions such as troubled sleeping or emotional outbursts (APA, 2013; Figley, 1999).

We hypothesised that gender would moderate the association between viewing knife crime on social media and STSS scores (H3). Although women reported higher STSS scores overall, we found no evidence for the moderating role of gender in this association. Our findings are consistent with existing literature which shows that women report more PTSD symptoms than men (Christiansen & Hansen, 2015; Irish et al., 201; Olff, 2017). Contrary to hypothesis H4, age did not moderate the association between viewing knife crime on social media and STS symptoms. However, we did find that younger participants reported higher STS symptoms than older participants did; the age category 18-25 scored highest on total STSS. As younger participants also reported much higher levels of social media use than older participants, a possible explanation is that increased social media usage in general, leads younger participants to potentially experience greater anxiety (Brooks, 2015; Vannucci et al., 2017).

We additionally hypothesised that residential location would moderate the association between knife crime viewed on social media and STSS scores, and we specifically predicted that those participants who lived in cities would be most at risk (H5). We found that residential location did moderate the association between viewing knife crime on social media and symptoms of intrusion and avoidance. However, it was those participants who lived in towns and villages who showed the greatest association between viewing knife crime and symptoms of intrusion and arousal. Fear of crime could potentially explain this result. Although knife crime is more prevalent in cities (ONS, 2020) research shows that the fear of crime is generalised within the population, with even individuals who are considered a low risk of experiencing crime showing fear (Prieto Curiel & Bishop, 2017). Fear of crime is increasing in rural areas (Gilling, 2016), possibly due to crime being increasingly broadcast, especially on social media which contributes towards a fear culture (Hardie, 2016). Meško (2020) stated that the fear of crime is more serious than the actual crime itself in some rural communities. This could possibly explain why participants who live in villages scored significantly higher on the avoidance subscales compared to those living in towns/cities, as one of the main aspects of this subscale is actively avoiding areas were the traumatic events (knife crime) may take place (e.g., cities) (Figley, 1999; APA, 2013). Furthermore, previous research has found that those living in rural settings show less trust and lower satisfaction in the police with some communities feeling ignored and isolated (Meško, 2020; National Rural Crime Network, 2018;).

This is the first study to demonstrate that viewing knife-crime related news on social media is associated with STS symptoms. Implications of these finding could be to help target prevention and intervention strategies towards those most at risk and also to raise awareness within social media users and platform owners of the nature of the risk and the profile of those most at risk. As Brooks (2015) stated, social media will continue to grow with more people experiencing adverse effects. Therefore, understanding the risks, who is most at risk and most importantly, how to remedy them will be increasingly important to ensure safe use. A large proportion of the sample (63%) rated some level of STS with 28% reporting clinical levels of PTSD (scoring 38 or more), indicating they could need professional help (Bride, 2007). This is perhaps the most concerning finding of this study, and a similar rate to that reported by Ramsden (2015) and Comstock and Platania (2017) of nearly a quarter of participants reporting clinical levels of STS.

It is important to acknowledge the limitations of the research presented here. First, as this research is cross-sectional, it is difficult to obtain causal relationships due to its one-time measurement of exposure and outcome (Setia, 2016). Therefore, future research into this subject could utilise different research methods, including longitudinal data and incorporating qualitative research methods to develop a more holistic picture and improve the conclusions that can be made (Solem, 2015). There are also sample limitations of the study as there were more female participants (81%) than male participants (19%) which is unrepresentative of the general population and could have explained the gender difference in total STSS scores. Gender bias a common issue with online survey research as previous research highlights that women are more likely to partake in online surveys compared to men (Smith, 2008). Similarly, the sample included more young participants, which may explain the result found for age. Thus, future research should try to obtain a more representative demographic sample. Additionally, future research should consider ethnicity as a potential moderator of the association between viewing knife crime on social media and STS, which the present study did not address. Due to the sensitive nature of this topic, response/non-response bias may have occurred. Individuals with strong feelings towards knife crime may be more likely to partake in the online survey due to personal importance, or less likely due to avoidance of this topic (Ting et al., 2005). It is also important to note that data collection for the current study took place throughout July 2020 during the COVID-19 pandemic when the first UK national lockdown had just ended, but many local restrictions remained (World Health Organisation, 2020; Gov UK, 2020). This may have impacted participants' attitudes towards knife crime as COVID-19 was the main media focus at the time, and individuals were more likely to stay at home, making knife crime less of a threat. However, research shows that COVID-19 has had a negative psychological impact on many individuals inducing psychiatric symptoms such as depression and anxiety (Ho et al., 2020). This may have deterred

individuals from partaking in the current study to avoid further stress from the unpleasant topic (knife crime) or may have caused participants to respond with heightened stress, biasing the results. Supporting evidence of this comes from James and Xiaowei (2020), who found that young individuals and women experienced the largest declines in mental health due to COVID-19, which is interestingly compliant with the findings of the current study in that young women experienced the highest levels of STS.

This is the first study to demonstrate an association between viewing knife crime on social media and STS. However, it is unknown what social media platforms participants viewed the knife crime on. A suggestion for future research would be to examine whether the impact of viewing knife crime related news has different salience and effects when viewed on different social media platforms. Previous research suggests that social anxiety is a predictor of problematic internet use (Lee & Stapinski, 2012). This type of problematic internet use can be compounded by the algorithms within social media, which may further bias the users use of the platform towards similar content (Eslami et al., 2015). This can cause an overrepresentation of certain phenomena (such as knife crime), exaggerating the issue and exacerbating an individual's anxiety towards the issue. Therefore, future research could also examine the moderating effects of social anxiety on the relationship between the frequency of knife crime viewed on social media and STSS scores.

CONCLUSION

In conclusion, the current study was the first to demonstrate that viewing more knife crime content on social media is associated with higher STS levels. We also found that individuals who live in villages/towns and who view more knife crime content on social media are at an increased risk of experiencing higher levels of STS. The arousal subscale, with symptoms including bodily reactions (such as problems with sleeping and angry outbursts), was the most commonly experienced category of symptoms for participants who viewed more knife crime on social media. Additionally, younger women reported higher STS scores in general, but this was not in interaction with levels of knife crime viewed on social media. This study is a valuable contribution to literature in this field, as it expands previous research on STS induced by media and is the first to focus specifically on knife crime and social media. As the use of social media increases, it is vital to understand and raise awareness of the adverse consequences. The results of this study can improve our knowledge and inspire further research to improve our understanding and promote safer usage of social media.

REFERENCES

Ahern, J., Galea, S., Resnick, H., & Vlahov, D. (2004) 'Television images and probable posttraumatic stress disorder after September 11: The role of background characteristics, event exposures, and perievent panic. *The Journal of Nervous and Mental Disease*, *192*(3)217–226. https://doi.org/10.1097/01.nmd.0000116465.99830.ca

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.).

Andrade, C. (2019). The p value and statistical significance: Misunderstandings, explanations, challenges, and alternatives. *Indian Journal of Psychological Medicine*, *41(3)*, 210–215. https://doi.org/10.4103/IJPSYM.IJPSYM_193_19

Badger, K., Royse, D., & Craig, C. (2008). Hospital social workers and indirect trauma exposure: An exploratory study of contributing factors. *Health and Social Work*, *33(1)*, 63–71. https://doi.org/10.1093/hsw/33.1.63

Banks, J., & Xu, X. (2020). The mental health effects of the first two months of lockdown and social distancing during the Covid-19 pandemic in the UK. *IFS Working Papers*, W20/16. http://dx.doi.org/10.1920/wp.ifs.2020.1620

Baum, N., Rahav, G., & Sharon, M. (2014). Heightened susceptibility to secondary traumatization: A meta-analysis of gender differences. *American Journal of Orthopsychiatry*, *84(2)*, 111. https://doi.org/10.1037/h0099383

Benuto, L. T., Yang, Y., Ahrendt, A., & Cummings, C. (2018). The secondary traumatic stress scale: Confirmatory factor analyses with a national sample of victim advocates. *Journal of Interpersonal Violence*, 1–20. https://doi.org/10.1177/088626051875957

Booth, R. (2019). *Anxiety on rise among the young in social media age*. The Guardian. Retrieved from https://www.theguardian.com/society/2019/feb/05/youth-unhappiness-uk-doubles-in-past-10-years

Bride, B. E. (2007). Prevalence of secondary traumatic stress among social workers. *Social Work*, *52(1)*, 63–70. https://doi.org/10.1093/sw/52.1.63

Bride, B. E., Robinson, M. M., Yegidis, B., & Figley, C. R. (2004). Development and validation of the secondary traumatic stress scale. *Research on Social Work Practice*, *14(1)*, 27–35.

https://doi.org/10.1177/1049731503254106
British Psychological Society. (2018, July). *Code of Ethics and Conduct July 2018*.
Brooks, S. (2015). Does personal social media usage affect efficiency and well-being? *Computers in Human Behavior*, *46*, 26–37. https://doi.org/10.1016/j.chb.2014.12.053
Cameron, J. J., & Stinson, D. A. (2019). Gender (mis) measurement: Guidelines for respecting gender diversity in psychological research. *Social and Personality Psychology Compass*, *13(11)*, e12506. https://doi.org/10.1111/spc3.12506
Christiansen, D. M., & Hansen, M. (2015). Accounting for sex differences in PTSD: A multi-variable mediation model. *European Journal of Psychotraumatology*, *6(1)*, 26068. https://doi.org/10.3402/ejpt.v6.26068
Comstock, C., & Platania, J. (2017). The role of media-induced secondary traumatic stress on perceptions of distress. *American International Journal of Social Science*, *16(1)*.
Daoud, J. I. (2017, December). Multicollinearity and regression analysis. *Journal of Physics: Conference Series, 949(1)*, 012009. https://doi.org/10.1088/1742-6596/949/1/012009
De Vaus, D. (2013). *Surveys in Social Research* (6th ed.). Routledge.
Dominguez-Gomez, E., & Rutledge, D. N. (2009). Prevalence of secondary traumatic stress among emergency nurses. *Journal of Emergency Nursing*, *35(3)*, 199–204. https://doi.org/10.1016/j.jen.2008.05.003
Eslami, M., Rickman, A., Vaccaro, K., Aleyasen, A., Vuong, A., Karahalios, K., Hamilton, K., & Sandvig, C. (2015, April). *"I always assumed that I wasn't really that close to [her]" Reasoning about Invisible Algorithms in News Feeds.* Proceedings of the 33rd annual ACM conference on human factors in computing systems, 153–162. https://doi.org/10.1145/2702123.2702556
Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G* Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39(2)*, 175–191. https://doi.org/10.3758/bf03193146
Figley, C. R. (1983). Catastrophes: An overview of family reactions. In C. R. Figley, & H. I. McCubbin (Eds.), *Stress and the family* (pp. 3–20). Brunner/Mazel.
Figley C. R. (1999). Compassion fatigue: Toward a new understanding of the cost of caring. In B.H. Stamm (Ed.), *Secondary traumatic stress* (pp. 3–28). Sidran Institute.
Figley, C. R. (1995). Compassion fatigue: Coping with secondary traumatic stress in those who treat the traumatized. In C. R. Figley (Ed.), *Compassion fatigue: Coping with secondary traumatic stress in those who treat the traumatized* (pp. 1–20). Brunner/Mazel.
Flintham, M., Karner, C., Bachour, K., Creswick, H., Gupta, N., & Moran, S. (2018). Falling for fake news. *Proceedings of the 2018 CHI Conference on Human Factors in Computing Systems*. https://doi.org/10.1145/3173574.3173950
Gilling, D. (2016). Governing crime in rural UK: risk and representation. In R. I. Mawby & R. Yarwood (Eds.), *Rural policing and policing the rural* (pp. 83–90). Routledge. https://doi.org/10.4324/9781315607191
Gov.uk. (2019, September,). *News Story: National campaign to recruit 20,000 police officers launches today.* Home Office, The Tr Hon Boris Johnson MP, and the Rt Hon Patel MP. https://www.gov.uk/government/news/national-campaign-to-recruit-20000-police-officers-launches-today
Gov.uk. (2020, July). *Collection: Local restrictions: Areas with an outbreak of coronavirus (COVID-19).* Department of Health and Social Care. https://www.gov.uk/government/collections/local-restrictions-areas-with-an-outbreak-of-coronavirus-covid-19
Grimshaw, R., & Ford, M. (2018). Young people, violence and knives: Revisiting the evidence and policy discussions. *Centre for Crime and Justice Studies*.
Hardie, H. (2016). *How the media perpetuates fear culture.* The Hamilton Spectator. Retrieved from https://www.thespec.com/community-story/6249611-how-the-media-perpetuates-fear-culture/
Harding, S. (2020). Getting to the point? Reframing narratives on knife crime. *Youth Justice*, *20(1-2)*, 31–49. https://doi.org/10.1177/1473225419893781
Ho, C. S., Chee, C., & Ho, R. (2020). Mental health strategies to combat the psychological impact of Coronavirus disease 2019 (COVID-19) beyond paranoia and panic. *Annals of the Academy of Medicine, 49*, 1–3. https://doi.org/10.47102/annals-acadmedsg.202043
Intravia, J., Wolff, K. T., Paez, R., & Gibbs, B. R. (2017). Investigating the relationship between social media consumption and fear of crime: A partial analysis of mostly young adults. *Computers in Human Behavior*, *77*, 158–168. https://doi.org/10.1016/j.chb.2017.08.047
Irish, L. A., Fischer, B., Fallon, W., Spoonster, E., Sledjeski, E. M., & Delahanty, D.L. (2011). Gender differences in PTSD symptoms: An exploration of peritraumatic mechanisms. *Journal of Anxiety Disorders*, *25(2)*, 209–216. https://doi.org/10.1016/j.janxdis.2010.09.004

Jacobs, I., Charmillot, M., Martin Soelch, C., & Horsch, A. (2019). Validity, reliability, and factor structure of the secondary traumatic stress scale-French version. *Frontiers in Psychiatry*, *10*. https://doi.org/10.3389/fpsyt.2019.00191

Lasorsa, D. L., Lewis, S. C., & Holton, A. E. (2012). Normalizing Twitter. *Journalism Studies*, *13(1)*, 19–36. https://doi.org/10.1080/1461670x.2011.571825

Lee, B. W., & Stapinski, L. A. (2012). Seeking safety on the internet: Relationship between social anxiety and problematic internet use. *Journal of Anxiety Disorders*, *26(1)*, 197–205. https://doi.org/10.1016/j.janxdis.2011.11.001

Liszewski, W., Peebles, J. K., Yeung, H., & Arron, S. (2018). Persons of nonbinary gender – awareness, visibility, and health disparities. *New England Journal of Medicine*, *379(25)*, 2391–2393. https://doi.org/10.1056/nejmp1812005

MacEachern, A. D., Dennis, A. A., Jackson, S., & Jindal-Snape, D. (2019). Secondary traumatic stress: Prevalence and symptomology amongst detective officers investigating child protection cases. *Journal of Police and Criminal Psychology*, *34(2)*, 165–174. https://doi.org/10.1007/s11896-018-9277-x

McNally, R. J. (2009). Can we fix PTSD in DSM-V? *Depression and Anxiety*, *26(7)*, 597–600. https://doi.org/10.1002/da.20586

Meško, G. (2020). Rural Criminology – A Challenge For the Future. *European Journal of Crime, Criminal Law and Criminal Justice*, *28(1)*, 3–13. https://doi.org/10.1163/15718174-02801001

Mirsaleh, Y. R., Ahmadi, K., Davoudi, F., & Mousavi, S. Z. (2014). Validity, Reliability, and Factor Structure of Secondary Trauma Stress Scale (STSS) in a Sample of Warfare Victims' Children. *Iranian Journal of Psychiatry and Clinical Psychology*, *20(2)*, 134–143. https://doi.org/10.3389/fpsyt.2019.00191

Nation Rural Crime Network. (2018). *Living on the edge: Why crime and anti-social behaviour is leaving rural communities and businesses frustrated, undervalued and isolated.* National Rural Crime Survey.

Neria, Y., DiGrande, L., & Adams, B. G. (2011). Posttraumatic stress disorder following the September 11, 2001, terrorist attacks: A review of the literature among highly exposed populations. *American Psychologist*, *66(6)*, 429–446. https://doi.org/10.1037/a0024791

Nosek, B. A., Beck, E. D., Campbell, L., Flake, J. K., Hardwicke, T. E., Mellor, D. T., van't Veer, A. E., & Vazire, S. (2019). Preregistration is hard, and worthwhile. *Trends in Cognitive Sciences*, *23(10)*, 815–818. https://doi.org/10.1016/j.tics.2019.07.009

Ofcom. (2019, July 24). *News consumption in the UK: 2019.* Jigsaw Research. Retrieved from https://www.ofcom.org.uk/__data/assets/pdf_file/0027/157914/uk-news-consumption-2019-report.pdf

Ofcom. (2020, June 24). *Adults' media use & attitudes report 2020.* Retrieved from https://www.ofcom.org.uk/__data/assets/pdf_file/0031/196375/adults-media-use-and-attitudes-2020-report.pdf

Office for National Statistics [ONS] (2020, January 23). *Crime in England and Wales: Year ending September 2019.*

Olff, M. (2017). Sex and gender differences in post-traumatic stress disorder: an update. *European Journal of Psychotraumatology*, *8(4)*, 1351204. https://doi.org/10.1080/20008198.2017.1351204

Pai, A., Suris, A. M., & North, C. S. (2017). Posttraumatic stress disorder in the DSM-5: Controversy, change, and conceptual considerations. *Behavioral Sciences*, *7(1)*, 7. https://doi.org/10.3390/bs7010007

Palmer, P. B., & O'Connell, D. G. (2009). Regression analysis for prediction: Understanding the process. *Cardiopulmonary Physical Therapy Journal*, *20(3)*, 23–26. https://doi.org/10.1097/01823246-200920030-00004

Prieto Curiel, R. & Bishop, S. (2017). Modelling the fear of crime. *Proceedings of the Royal Society A: Mathematical, Physical and Engineering Sciences*, *473(2203)*, 20170156. https://doi.org/10.1098/rspa.2017.0156

Ramsden, P. (2015, May 6). *Viewing violent news on social media can cause trauma* [Conference presentation]. The Annual Conference of the British Psychology Society, Liverpool.

Schlenger, W. E., Caddell, J. M., Ebert, L., Jordan, B. K., Rourke, K. M., Wilson, D., Thalji, L., Dennis, J. M., Fairbank, J. A., & Kulka, R. A. (2002). Psychological reactions to terrorist attacks. *JAMA*, *288*(5), 581. https://doi.org/10.1001/jama.288.5.581

Scott, C. F., Bay-Cheng, L. Y., Prince, M. A., Nochajski, T. H., & Collins, R. L. (2017). Time spent online: Latent profile analyses of emerging adults' social media use. *Computers in Human Behavior*, *75*, 311–319. https://doi.org/10.1016/j.chb.2017.05.026

Secker, R. M. M. &, Braithwaite, E. C. (2020). Social media induced secondary traumatic stress. Open Science Framework [OSF].

Setia M. S. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology*, *61(3)*, 261. https://doi.org/10.4103/0019-5154.182410

Shaw, D. (2020). Knife crime in England and Wales rise to record high, ONS figure shows: Analysis by Danny Shaw home affairs correspondent. BBC.

Shu, K., Sliva, A., Wang, S., Tang, J., & Liu, H. (2017). Fake news detection on social media. *ACM SIGKDD Explorations Newsletter*, *19(1)*, 22–36. https://doi.org/10.1145/3137597.3137600

Siegel, F. A. (2016). *Practical Business Statistics* (7th ed.). Academic Press.

Smith, G. (2008). Does gender influence online survey participation: A record-linkage analysis of university faculty online survey response behavior (ERIC Document Reproduction Service No. ED 501717) [San José State University].

Solem, R. C. (2015). Limitation of a cross-sectional study. *American Journal of Orthodontics and Dentofacial Orthopedics*, *148(2)*, 205. https://doi.org/10.1016/j.ajodo.2015.05.006

Swart, J., Peters, C., & Broersma, M. (2016). Navigating cross-media news use. *Journalism Studies*, *18(11)*, 1343–1362.

Ting, L., Jacobson, J. M., Sanders, S., Bride, B. E., & Harrington, D. (2005). The secondary traumatic stress scale (STSS) confirmatory factor analyses with a national sample of mental health social workers. *Journal of Human Behavior in the Social Environment*, *11(3–4)*, 177–194. https://doi.org/10.1300/j137v11n03_09

Vannucci, A., Flannery, K. M., & Ohannessian, C. M. (2017). Social media use and anxiety in emerging adults. *Journal of Affective Disorders*, *207*, 163–166. https://doi.org/10.1016/j.jad.2016.08.040

Wayne, T. (2016, September 10). *The trauma of violent News on the Internet*. The New York Times. https://www.nytimes.com/2016/09/11/fashion/the-trauma-of-violent-news-on-the-internet.html

World Health Organisation. (2020). *Coronavirus disease (COVID-19) Pandemic.* https://www.who.int/emergencies/diseases/novel-coronavirus-2019

Wright, K. B. (2005). Researching internet-based populations: Advantages and disadvantages of online survey research, online questionnaire authoring software packages, and web survey services. *Journal of Computer-mediated Communication*, *10(3)*, JCMC1034. https://doi.org/10.1111/j.1083-6101.2005.tb00259.x