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The development of the Adapted Firesetting Assessment Scale

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Abstract:	Background: Treatment for adults who set fires relies upon valid and reliable assessment, but there are currently no empirically validated tools available for use with adults with intellectual and other developmental disabilities. Method: This study aimed to gain consensus on the accessibility of item adaptations made to the Fire Interest Ratings Scale, Fire Attitudes Scale and the Identification with Fire Questionnaire. Using a Delphi exercise and focus group with experts and adults with intellectual and other developmental disabilities, adapted items were presented and evaluated. Results: Current tools used in the assessment and treatment of adults who set fires are not accessible to adults with intellectual and other developmental disabilities and require adaptation. Conclusion: Following feedback, revisions to current tools were implemented leading to the development of the Adapted Firesetting Assessment Scale, with improved validity and accessibility for adults with intellectual and other developmental disabilities.

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Abstract

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Method: This study aimed to gain consensus on the accessibility of item adaptations made to the Fire Interest Ratings Scale, Fire Attitudes Scale and the Identification with Fire Questionnaire. Using a Delphi exercise and focus group with experts and adults with intellectual and other developmental disabilities, adapted items were presented and evaluated.

Results: Current tools used in the assessment and treatment of adults who set fires are not accessible to adults with intellectual and other developmental disabilities and require adaptation.

Conclusion: Following feedback, revisions to current tools were implemented leading to the development of the Adapted Firesetting Assessment Scale, with improved validity and accessibility for adults with intellectual and other developmental disabilities.

Key Words

Intellectual disabilities; Learning disabilities; Autism; Developmental disabilities; Firesetting; Arson

Introduction

Within England and Wales, deliberate fire setting is estimated to cost £1.45 billion per year (Arson Prevention Forum, 2017), with 69,846 incidents of deliberate fire setting results in 55 deaths and 485 non-fatal causalities in 2019 to 2020 (Home Office, 2020). Some of those who set fires will have intellectual and other developmental disabilities (Collins et al., 2021), but we know little about the actual prevalence of this crime amongst this population, while those with intellectual and other

developmental disabilities who set fires appear to be over-represented in secure hospitals (e.g., Alexander et al., 2011; Chester et al., 2018).

Collins et al. (2021) reported that those with intellectual and other developmental disabilities who set fires had similar developmental experiences to people without developmental disabilities who set fires, which may have contributed to their risk of fire setting. These included being male, Caucasian, of low socio-economic status, and having a history of trauma, aggression, impulsivity, and difficulties with relationships and adaptive coping strategies. However, those with intellectual and other developmental disabilities had difficulties communicating with others, lacked appropriate support, had significantly lower self-esteem, and difficulties with assertiveness skills relative to those without these disabilities who set fires (Collins et al., 2021). The authors went on to suggest that these additional factors are not reflected within current fire setting assessment tools for use with those who have intellectual and other developmental disabilities (Collins et al., 2021).

Robust fire-related assessment tools for use with those with developmental disabilities are needed to help inform individual case management within inpatient and community settings (Lindsay & Beail, 2004). Assessment can determine treatment need, inform level of risk (Marshall, 1996), clarify who is suitable for treatment, and index change following treatment (Keeling et al., 2007). However, self-report assessments require the respondent to understand the instructions, questions, and the response format (Chester et al., 2015). The use of poorly adapted measures could have several implications, including low response rates, high response bias, poor reliability, and validity (Sigelman et al., 1981; Heal & Sigelman, 1995; Finlay & Lyons, 2002). In the absence of reliable and valid tools, local services may develop or adapt their own assessments, which can lead to difficulties when comparing findings across services.

Several self-report measures have been specifically developed for adults with intellectual disabilities who have engaged in sexual or violent offending. For example, the Sexual Attitudes and Knowledge Questionnaire (Heighway & Webster, 2007), the Sexual Offenders Self Appraisal Scale (Bray & Foreshaw, 1996), the Questionnaire on Attitudes Consistent with Sexual Offending

(Broxholme & Lindsay, 2003; Lindsay et al., 2000; Lindsay et al., 2006; Lindsay, et al., 2007), and the Socio-Sexual Knowledge and Attitudes Assessment – Revised (Griffiths and Lunsky, 2003) have all been developed for and used with adults with intellectual disabilities. Others have adapted existing measures (e.g., Victim Empathy Scale-Adapted; Beckett & Fisher, 1994; Langdon et al., 2007). Similarly, research has been conducted to demonstrate the validity of risk assessments for violent offending (e.g., Fitzgerald et al., 2013; Gray et al., 2007). However, very few studies have focused upon the development and evaluation of assessments for fire setting by adults with intellectual or other developmental disabilities.

Tools available for use with adults who set fires focus upon risk assessment or appraise characteristics likely to be associated with the risk of firesetting (e.g., Pathological Fire-Setters Interview, Taylor et al., 2004; Fire Attitudes Scale, Muckley, 1997; the Identification with Fire Questionnaire, Gannon et al., 2011; Fire Setting Scale, Gannon & Barrowcliffe, 2012). However, the psychometric properties of current tools have not been sufficiently explored with adults with developmental disabilities, bearing in mind that The Fire Attitudes Scale (Muckley, 1997) had poor internal consistency when used with adults without developmental disabilities (α = .64; Barrowcliffe & Gannon, 2015), while The Identification with Fire Questionnaire (Gannon et al., 2011) had acceptable internal consistency when used with adults without developmental disabilities (α = .71; Barrowcliffe & Gannon, 2015).

Few tools have been developed specifically for adults with intellectual and other developmental disabilities who set fires. The Northgate Firesetter Risk Assessment (NFRA; Taylor & Thorne, 2005) was developed from the HCR-20 (Webster et al., 1997) to incorporate a wide range of historical and clinical risk factors related to firesetting. However, the HFRA has not been published or empirically evaluated. The St Andrew's Fire and Arson Risk Instrument (SAFARI; Long et al., 2014) is a semi-structured interview examining the antecedents, behaviour, and consequences of firesetting, as well as readiness to change, firesetting self-efficacy, perceived probability of future firesetting, barriers to change, and understanding of firesetting behaviours. The Fire Interest Rating Scale (FIRS;

Murphy & Clare, 1996) was developed for use with adults with intellectual disabilities and those who had set fires scored significantly higher than those who had not. The Firesetting Assessment Schedule (FASch; Murphy & Clare, 1996) examines the events, feelings and cognitions prior to and after setting fires. As with the other tools developed to assess firesetting behaviour among adults, large validation studies have not been completed.

The properties of the Fire Attitudes Scale, the Identification with Fire Questionnaire and The Fire Interest Rating Scale were examined by O' Ciardha et al. (2015) who identified four factors, relevant to treatment need for people without developmental disabilities who set fires: (i) identification with fire, (ii) serious fire interest, (iii) poor fire safety, (iv) firesetting as normal. Low to acceptable scale reliabilities (αs = .63 to .87) for each of the factors were reported. Data collected to validate these measures was obtained from adults without developmental disabilities. Despite a lack of evidence concerning the validity of these measures when used with adults with intellectual or other developmental disability, the Five Factor Fire Scale (Ó Ciardha et al., 2015), which combines items from the three measures, is currently used in practice when assessing adults who set fires for treatment suitability and for therapeutic evaluation (Gannon et al., 2013; Gannon et al., 2015). However, research does not support the validity of these measures when used with this population, therefore limiting our knowledge, and understanding of firesetting behaviour. Nevertheless, the research by Ó Ciardha et al. suggested the fire specific factors need to be addressed when offering treatment. Consequently, both researchers and practitioners would benefit from the development of an empirically evaluated tool, specific to adults with intellectual and other developmental disabilities that focuses on the fire-related factors proposed by Ó Ciardha et al. (2015). An adapted tool, which is empirically validated for this population would provide a useful resource for professionals, and ultimately better inform treatment need for this population.

Aims

The current study has the following aims:

1. To develop an accessible self-report tool to appraise the fire specific factors likely to be associated with firesetting behaviour informed by expert opinion obtained from a Delphi exercise.
2. To evaluate the assessment tool using a focus group discussion with adults with intellectual and other developmental disabilities.

Method

Stage 1: Delphi

This study employed the Delphi technique, a multistage process commonly used in medical, nursing, and health service research. The technique seeks to obtain consensus on the opinion of 'experts' through a series of structured questionnaires completed anonymously on the topic of interest (Linstone & Turoff, 1975). McKenna (1994 p. 1221) defined participants as `a panel of informed individuals', who are therefore considered `experts'. The process was designed to combine opinion into group consensus (McKenna, 1994), whereby the responses from each round of data collection were fed back in a summarised form to the experts. For the current study, the Delphi technique was employed using email and online surveys to allow for experts from different geographically locations to be more easily involved. Additionally, a qualitative element in the Delphi exercise responses were sought to obtain deeper and richer data to allow for greater understanding of reasoning behind responses.

Participants. A total of 19 experts completed round one (13 females and 6 males), aged between 25 and 60 (M = 40.78, SD = 10.69), 17 of whom completed round two and 15 of whom completed round three. This led to an overall attrition rate of 21%, which is no larger than is to be expected for a Delphi exercise (Walker & Selfe, 1996). Participants were eligible to participate if they were a registered healthcare professional working in a service for adults with intellectual and other developmental disabilities (e.g., nurses, psychologists, social workers, speech and language

therapist, and psychiatrists). No specific exclusion criteria were applied given the purposive sampling method. An intended sample size of ten experts was sought in line with Delphi recommendations (Linstone & Turoff, 2002; Murphy et al., 1998). Most experts (n = 17) were from the UK, one expert was from the Cayman Islands and one expert was from Australia. Although most experts were psychologists (n = 11), other roles included an academic in nursing and health (n = 1), psychiatrist (n = 1), hospital manager (n = 1), speech and language therapist (n = 1), and nurses (n = 4).

The majority of participants had over ten years of experience working with adults with intellectual and other developmental disabilities (n = 12), and over five years of experience working with adults who had set a fire (n = 12) in areas of assessment, treatment, care planning and research (see Table 1). One expert had no experience of working with adults who had set a fire but 20 years of experience working with adults with intellectual and other developmental disabilities. A second expert, an academic in mental health nursing and health, had 15 years of experience researching firesetting behaviour.

Table 1

Relevant experience

[INSERT TABLE 1]

Procedure. Eligible experts were contacted by email and invited to take part in the study. The invitation email included the rationale, intended aims of the Delphi exercise, and the web link to the survey. On opening the link, experts were provided with a hyperlink to the full information sheet and consent form containing further information about the study and the researchers contact details. If respondents consented to continue, they were asked to complete some demographic questions (i.e., age, gender) and provide brief professional background information (i.e., job role, type of service they were working in, their experience of working with adults with intellectual and other developmental disabilities, and their experience of working with adults who had set a fire).

Next, experts were asked some general questions about the assessment of adults with intellectual and other developmental disabilities, which included how long an assessment should take, what is required for an assessment to be accessible, the type of response an assessment should aim to achieve (i.e., quantitative, or qualitative data), and how many response options should be presented to adults with intellectual and other developmental disabilities.

Experts were then presented with each item from the Fire Interest Ratings Scale (Murphy & Clare, 1996), Fire Attitudes Scale (Muckley, 1997), and the Identification with Fire Questionnaire (Gannon et al., 2011). Experts were asked to rate each of the 44 assessment tool items along a Likert scale from 1 (not at all complex) to 3 (far too complex). When ratings items, experts were encouraged to consider the complexity of the language used and whether adults with intellectual and other developmental disabilities were likely to understand what was being asked of them. Where an item was rated 'a little complex' or 'far too complex' experts were encouraged to provide an explanation for their response. An opportunity to provide additional comments at the end of the survey was provided.

Based on the results of round one, items were adapted. Those who completed the first round were invited to take part in the second round of data collection. An email was sent to participants with a web link and a summary of findings from round one. On consenting to complete round two, experts were presented with a hyperlink to the adapted items. As with round one, experts were asked to rate items and were invited to provide further comments. In round two, if a consensus of 'not at all complex' was reached for an item, it was considered suitable to retain, and was removed from the subsequent round of data collection. No more than three rounds of data collection were conducted, as this is considered an acceptable number to obtain sufficiently detailed feedback during a Delphi exercise (Chang et al., 2010).

Analysis. Results of the Delphi exercise were downloaded in an anonymous format onto an encrypted computer. Descriptive methods were used to report findings. Frequency data were

generated to describe the professional background of participants. Percentages were calculated to describe the ratings made in round one, two, and three. The consensus level for items rated using the Likert scale for round two was set at 80% (i.e., 80% of experts rated the item 'not at all complex') based on guidelines reported by Hasson et al. (2000). Free text responses were used to inform changes made to assessment tool items leading to the development of the Adapted Firesetting Assessment Scale.

Stage 2: Focus Group

An online focus group, using Zoom video conferencing software, was used to further evaluate the items within the Adapted Firesetting Assessment Scale. Focus group methodology allowed the participants to explore and clarify their views of the assessment items in ways that are not as accessible in traditional individual interview formats. Furthermore, it allowed participants an opportunity to engage and interact using a format to which they felt comfortable.

Participants. Three adults (2 males and 1 female) with intellectual and other developmental disabilities provided their informed consent to partake in the focus group discussion. Participants were recruited from the community, and where possible, because they had a history of setting fires.

Procedure. Purposive sampling was used, whereby potential participants were contacted via email and invited to take part in the online focus group. Participants were provided with an information sheet and given the opportunity to provide either written or verbal informed consent, which included permission to record the discussion. Questionnaire items were shared with participants over Zoom and they were asked to comment verbally on the clarity of the written text and pictures for each item, as well as the response format and overall impression of the questionnaire. The focus group discussion was led by the first author. The second and third authors

were present throughout to support respondents, focus the conversations, and encourage participants to proportionally contribute to the deliberation.

Analysis. The focus group was recorded and consensus ratings for each item were obtained. Feedback from participants was used to inform the development of the Adapted Firesetting Assessment Scale. Responses were kept confidential, and any direct quotations were anonymized.

Ethical Approval

The research study received Health Research Authority and a favourable opinion from the Social Care Research Ethics Committee. Informed consent was obtained electronically prior to participation.

Results

Assessment of adults with developmental disabilities

Assessment length. The majority of participants reported that an assessment for adults with intellectual and other developmental disabilities should take 20-30 minutes (see Table 2). The three participants who did not specify a time highlighted the importance of taking the individual service users' strengths and challenges into consideration.

Table 2

Preferred length of time for assessment

[INSERT TABLE 2]

Areas requiring improvement. When asked how assessment tools for adults with intellectual and other developmental disabilities could be improved, experts identified three main

areas requiring improvement: sentence structure (i.e., sentences need to be concise and simple), language (i.e., language needs to be clear, simple, and without metaphors) and the additional need for visual aids to support understanding of instructions, questions, and rating scales. Experts also highlighted the importance of obtaining information from other sources (e.g., file review and family/carers).

Format of response. Most participants reported that adults with intellectual and other developmental disabilities would benefit from having some structured response options in the form of a Likert scale. However, they also highlighted the importance of participants being able to elaborate on their responses, where appropriate. Most participants reported that to improve the accuracy of outcome data, Likert scales should have no less than three response options and a maximum of five (see Table 3).

Table 3

Preferred number of response options

[INSERT TABLE 3]

Ratings

Round One. Participants were asked to rate all 44 items drawn from existing instruments on a three-point Likert scale from one (not at all complex) to three (far too complex) and provide a justification for their response. Despite 14 items being rated 'not at all complex' by at least 80% of participants in round one (see Table 4), free text feedback suggested the need for visual prompts for all items, and gender-neutral terminology (i.e., 'firefighter' instead of 'fireman') or modernisation for others (e.g., 'lighter' instead of 'matches'). Consequently, all 44 items were included for review in round two.

Table 4

Expert Ratings

[INSERT TABLE 4]

Round Two. Prior to round two, all 44 assessment tool items were adapted using feedback from round one. Round two then followed the same review procedure as round one. Findings indicated that 31 items were rated 'not at all complex' by at least 80% of participants, three items ('I do not need fire in my life', 'Fire makes me who I am', and 'Fire is a big part of who I am') were removed as they were too repetitive, and 10 items required further adaptations (see Table 4). Of the 10 items that were amended, the sentence structure for several was considered too complex. Several items contained a double negative, for example the item, 'If I did not see another fire again, I would be ok' was amended to, 'I would be ok If I never saw a fire again'. One item was amended to account for individuals who may have set a fire in a hospital environment rather than a community setting and several items were considered too abstract. These items referred to the concept of personal identity, for example 'Fire is a part of who I am' was amended to 'I describe myself as someone who sets fires'.

Round Three. Following round two, 10 items had still been rated by over 20% of experts as either a 'little complex' or 'far too complex'. Therefore, round three followed the same review procedure as round two. Again, experts were asked to rate the remaining 10 assessment tool items on a three-point Likert scale from one (not at all complex) to three (far too complex) and provide a justification for their response. Five items were rated 'not at all complex' by at least 80% of participants (see Table 4) and one item was removed as it was considered too repetitive ('I usually go along with what my mates decide'). Where free text feedback was provided, further adaptations to the remaining four items were made. Visual prompts were amended to better support understanding of the written text (e.g., police uniform was made clearer for the item 'The police talk to lots of people

about setting fires') and language further clarified (e.g., the word 'set' was replaced with the word 'start' for the item, 'I would describe myself as someone who sets fires').

Focus Group

Participants reviewed each item of the Adapted Firesetting Assessment Scale and agreed that 23 of the 41 items were accessible and that the images supporting the text aided understanding of items. Following discussion, participants reached a consensus on the remaining 18 items and their recommendations were used to make final amendments leading to a further refined version of the Adapted Firesetting Assessment Tool Scale.

Broad categories identified in participant discussions about questionnaire items included, the usefulness of pictorial content, the clarity of written text, and the questionnaire item response options. Feedback concerning the clarity of pictures used to support understanding for questionnaire items, including the importance of using familiar emojis to represent emotional states and the use of colour to enhance images. These recommendations led to several amendments to the assessment. Primary colours were added to visual prompts to support understanding of the written text. For example, blue, red and yellow were added to the image of the fire engine to support the written text for the following item, 'Watching a fire engine come down the road' and red was added to all images of a fire extinguisher. A Likert scale representing a broader range of emotions was used and the response options were amended from 'upset/scared', 'ok' and 'excited/fun' to 'very upset/scared', 'a little upset', ok', and 'excited/fun'. Other recommendations included simplifying words (e.g., the words 'low', 'moderate', 'substantial' and 'critical' were amended to 'low', 'medium' and 'high' to support understanding of the item 'I need fire in my life'). Recommendations to improve the accuracy of visual prompts were implemented for several items including 'I have put a fire out', which was amended from being an image of a fire extinguisher next to ashes on the ground to a fire being extinguished by a person. Other recommendations included adding a red triangle with an explanation mark to the item 'Playing with a lighter can be dangerous' and amending the visual

prompt for the item, 'People who set fires should be sent to prison' to show the face and body of an unhappy person behind bars. Lastly, participants raised concerns that some questionnaire items were too suggestive, commenting that the use of a green thumbs up to represent happy may prompt a respondent to automatically agree with the questionnaire item. This led authors to remove the green thumbs up from one visual prompt.

Discussion

This is the first study to develop of an adapted assessment of fire specific factors, which was informed by expert opinion and evaluated by participants from the population for whom its use is intended. The current study provides some preliminary validation for the Adapted Firesetting Assessment Scale and represents the first step towards developing an adapted measure to assess the fire specific treatment needs of adults with intellectual and other developmental disabilities.

Ó Ciardha et al. (2015) developed the four-factor fire scale, which measures several fire specific treatment needs of adults who set fires, including identification with fire (i.e., fire as essential to a person's identity or functioning), serious fire interest (i.e., excitement associated with destructive or life-threatening fires), firesetting as normal (i.e., setting fires is a relatively usual occurrence), and poor fire safety (i.e., a perceived lack of fire safety knowledge and minimization of fire safety importance). However, the questionnaire items had not been adapted, and the validity of the Four Factor Fire Scale when used with adults with intellectual and other developmental disabilities remains untested. Nevertheless, the research by Ó Ciardha et al. suggested the fire specific factors need to be addressed when offering treatment. Therefore, an adapted tool, grounded in evidence pertaining to fire related factors specific to adults with developmental disabilities (e.g., fire interest), will inform treatment need for this population and improve evidence-based practice.

During development of the Adapted Firesetting Assessment Scale experts were consulted on items of the Fire Interest Ratings Scale (Murphy & Clare, 1996), Fire Attitudes Scale (Muckley, 1997), and the Identification with Fire Questionnaire (Gannon et al., 2011), which were adapted to better

suit the needs of adults with intellectual and other developmental disabilities. Feedback obtained across three rounds of a Delphi exercise was used to adapt items and develop the Adapted Firesetting Assessment Scale. Recommendations led to the inclusion of visual aids to support understanding of written text, simple sentence structures (e.g., double negatives were removed), and less complex language being used. Additionally, more abstract concepts (e.g., identity) were explained, and items were adapted to ensure their relevance to service-users in both inpatient and community settings. A further evaluation of the Adapted Firesetting Assessment Scale during a focus group with adults with intellectual and other developmental disabilities, some of whom had set a fire, provided additional evidence for the validity of the items.

However, the importance of acknowledging the individual needs of service-users was highlighted by experts in this study, particularly regarding the time an assessment should take to complete. Service-users should also be provided with an opportunity to elaborate on their responses, suggesting adults with intellectual and other developmental disabilities should be assessed using a more structured self-report assessment tool alongside other forms of information gathering (e.g., file review, interview, third party information). Nevertheless, findings of the current research suggest measures assessing offending behaviour among adults with intellectual and other developmental disabilities need to be adapted and empirically evaluated.

Limitations

Experts were recruited from a range of inpatient and community services and encouraged to share the invitation to participate in the research with relevant colleagues. However, it is likely the invitation to participate did not reach all eligible practitioners. A small sample of three adults with intellectual and other developmental disabilities, considered to be the minimum group size for a focus group (Edmunds, 1999), could be construed as problematic. The recruitment of participants who were able to take part in the study online proved challenging as this part of the study was conducted during the Covid-19 lockdown restrictions within England (2020-2021). However, running

a focus group with three people allowed participants a greater opportunity to engage with the material and make valued contributions, as taking part in a larger focus group would place greater demands upon individuals. Nevertheless, the generalisability of the findings from the current study are limited, and further views from people with intellectual and other developmental disabilities should be captured within further validation work. This study provides a sound basis for researchers and practitioners on which to base further research and incorporate future developments in the field.

Implications for policy and practice

The current study highlighted the need to develop and empirically evaluate assessment tools specifically for adults with intellectual and other developmental disabilities who present with firesetting behaviour. The needs of this group during assessment may include additional visual material to aid understanding of the written text, structured response options, and flexibility in the time given to complete the assessment. Furthermore, the use of complex sentence structures and language, abstract concepts and double negatives are unhelpful, impeding the ability to understand what is being asked and increasing the likelihood of an inaccurate and unreliable response. Although further empirical evaluation, in the form of a pilot study and future factor analytic work is required, findings of the current study suggest the Adapted Firesetting Assessment Scale is a resource that can be used to inform future research, assessment, treatment and care planning for this sub-group of adults who set fires.

References

Alexander, R., Hiremath, A., Chester, V., Green, F., Gunaratna, I., & Hoare, S. (2011). Evaluation of treatment outcomes from a medium secure unit for people with intellectual disability. *Advances in Mental Health and Intellectual Disabilities*. https://doi.org/10.5042/amhid.2011.0013

Arson Prevention Forum. (2017). *State of the Nation Report.* Retrieved from http://www.stoparsonuk.org/arson/documents/Arson-Prevention-Forum-Booklet.pdf

Barrowcliffe, E. R., & Gannon, T. A. (2015). The characteristics of un-apprehended firesetters living in the UK community. *Psychology, Crime & Law*, 21(9), 836-853. https://doi.org/10.1080/1068316X.2015.1054385

Beckett, R. C., & Fisher, D. (1994, November). Assessing victim empathy: A new measure. In *13th annual conference of the Association for the Treatment of Sexual Abusers, San Francisco*.

Bray, D. & Forshaw, N. (1996). *Sex Offender's Self Appraisal Scale*. Version 1.1. Lancashire Care NHS Trust; North Warwickshire NHS Trust.

Broxholme, S. L., & Lindsay, W. R. (2003). Development and preliminary evaluation of a questionnaire on cognitions related to sex offending for use with individuals who have mild intellectual disabilities. *Journal of Intellectual Disability Research*, 47, 472-482. https://doi.org/10.1046/j.1365-2788.2003.00510.x

Chang, A. M., Gardner, G. E., Duffield, C., & Ramis, M. A. (2010). A Delphi study to validate an advanced practice nursing tool. *Journal of Advanced Nursing*, *66*(10), 2320-2330. https://doi.org/10.1111/j.1365-2648.2010.05367.x

Chester, V., McCathie, J., Quinn, M., Ryan, L., Popple, J., Loveridge, C., & Spall, J. (2015). Clinician experiences of administering the Essen Climate Evaluation Schema (EssenCES) in a forensic intellectual disability service. *Advances in Mental Health and Intellectual Disabilities*. https://doi.org/10.1108/AMHID-06-2014-0024

Chester, V., Völlm, B., Tromans, S., Kapugama, C., & Alexander, R. T. (2018). Long-stay patients with and without intellectual disability in forensic psychiatric settings: comparison of characteristics and needs. *BJPsych open*, 4(4), 226-234. https://doi.org/10.1192/bjo.2018.24

Collins, J., Barnoux, M., & Langdon, P. (2021). Adults with intellectual disabilities and autism who deliberately set fires: A systematic review. *Aggression & Violent Behaviour.* 101545. https://doi.org/10.1016/j.avb.2020.101545

Curtis, A., McVilly, K., & Day, A. (2012). Arson treatment programmes for offenders with disability: a systematic review of the literature. *Journal of Learning Disabilities and Offending Behaviour,* 3 (4): 186-205. https://doi.org/10.1108/20420921211327347

Edmunds, H. (1999). *The Focus Group Research Handbook*. Illinois: NTC.

Finlay, W. M., & Lyons, E. (2002). Acquiescence in interviews with people who have mental retardation. *Mental Retardation*, 40, 14–29. https://doi.org/10.1352/0047-6765(2002)040<0014:AIlWPW>2.0.CO;2

Fitzgerald, S., Gray, N. S., Alexander, R. T., Bagshaw, R., Chesterman, P., Huckle, P., ... & Snowden, R. J. (2013). Predicting institutional violence in offenders with intellectual disabilities: the predictive efficacy of the VRAG and the HCR-20. *Journal of Applied Research in Intellectual Disabilities*, *26*(5), 384-393. https://doi.org/10.1111/jar.12032

Gannon, T. A., & Barrowcliffe, E. (2012). Firesetting in the general population: The development and validation of the Fire Setting and Fire Proclivity Scales. *Legal and Criminological Psychology*, 17(1), 105-122. https://doi.org/10.1348/135532510X523203

Gannon, T. A., Ó Ciardha, C., & Barnoux, M. F. L. (2011). The Identification with Fire Questionnaire (Unpublished manuscript). CORE-FP, School of Psychology, University of Kent, Kent, UK.

Gannon, T., Ó Ciardha, C., Barnoux, M., Tyler, N., Mozova, K., & Alleyne, E. (2013). Male imprisoned firesetters have different characteristics to other imprisoned offenders and require specialist treatment. *Psychiatry: Interpersonal and Biological Processes*, 76(4), 349-364. https://doi.org/10.1521/psyc.2013.76.4.349

Gray, N. S., Fitzgerald, S., Taylor, J., MacCulloch, M. J., & Snowden, R. J. (2007). Predicting future reconviction in offenders with intellectual disabilities: The predictive efficacy of VRAG, PCL-SV, and the HCR-20. Psychological Assessment, 19(4), 474. https://doi.org/10.1037/1040-3590.19.4.474

Griffiths, D., & Lunsky, Y. (2003). Sociosexual knowledge and attitudes assessment tool (SSKAAT-R). *Wood Dale, IL: Stoelting*.

Hasson, F., Keeney, S., & McKenna, H. (2000). Research guidelines for the Delphi survey technique. *Journal of advanced nursing*, *32*(4), 1008-1015. https://doi.org/10.1046/j.1365-2648.2000.t01-1-01567.x

Heal, L. W., & Sigelman, C. K. (1995). Response biases in interviews of individuals with limited mental ability. *Journal of Intellectual Disability Research*, 39, 331–40. https://doi.org/10.1111/j.1365-2788.1995.tb00525.x

Heighway, S. M., & Webster, S. K. (2007). *STARS: Skills training for assertiveness, relationships building and sexual awareness*. Arlington, Texas: Future Horizons Inc.

Home Office. (2020*). Detailed Analysis of Fires Attended by Fire and Rescue Services in England*. Retrieved from: https://www.gov.uk/government/statistical-data-sets/fire-statistics-data-tables

Keeling, J. A., Beech, A. R., & Rose, J. L. (2007). Assessment of intellectually disabled sexual offenders: The current position. Aggression and Violent Behavior, 12(2), 229-241. https://doi.org/10.1016/j.avb.2006.08.001

Langdon, P. E., Maxted, H., Murphy, G. H., & Group, S. I. (2007). An exploratory evaluation of the Ward and Hudson Offending Pathways model with sex offenders who have intellectual disability. *Journal of Intellectual and Developmental Disability*, *32*(2), 94-105. https://doi.org/10.1080/13668250701364686

Lindsay, W. R., & Beail, N. (2004). Risk assessment: Actuarial prediction and clinical judgement of offending incidents and behaviour for intellectual disability services. Journal of Applied *Research in Intellectual Disabilities*, 17(4), 229-234. https://doi.org/10.1111/j.1468-3148.2004.00212.x

Lindsay, W. R., Michie, A. M., Whitefield, E., Martin, V., Grieve, A., & Carson, D. (2006). Response patterns on the questionnaire on attitudes consistent with sexual offending in groups of sex offenders with intellectual disabilities. *Journal of Applied Research in Intellectual Disabilities*, 19(1), 47-53. https://doi.org/10.1111/j.1468-3148.2005.00288.x

Lindsay, W. R., Whitefield, E., & Carson, D. (2007). An assessment for attitudes consistent with sexual offending for use with offenders with intellectual disabilities. *Legal and Criminological Psychology*, 12(1), 55-68. https://doi.org/10.1348/135532505X85882

Lindsay, W.R., Carson, D. & Whitefield, E. (2000). Development of a questionnaire on attitudes consistent with sex offending for men with intellectual disabilities. Journal of Intellectual Disability Research, 44, 368.

Linstone, H. A., & Turoff, M. (2002). *General applications: introduction. In The Delphi Approach: Techniques and Applications*, Turoff, M., & Linstone, H. A. (eds). Addison-Wesley Publishing Company Inc.: Reading, MA; 71–79. Retrieved from: http://www.is.njit.edu/pubs/delphibook.

Linstone, H. A., & Turoff, M. (Eds.). (1975). *The delphi method*. Reading, MA: Addison-Wesley.

Long, C. G., Banyard, E., Fulton, B., & Hollin, C. R. (2014). Developing an assessment of fire-setting to guide treatment in secure settings: The St Andrew's fire and arson risk instrument (SAFARI). *Behavioural and cognitive psychotherapy*, *42*(5), 617-628. https://doi.org/10.1017/S1352465813000477

Marshall, W. L. (1996). Assessment, treatment, and theorizing about sex offenders: Developments during the past twenty years and future directions. *Criminal Justice and Behavior*, 23(1), 162-199. https://doi.org/10.1177/0093854896023001011

McKenna, H. P. (1994) The Delphi technique: a worthwhile approach for nursing? *Journal of Advanced Nursing*, 19, 1221-1225. https://doi.org/10.1111/j.1365-2648.1994.tb01207.x

Muckley, A. (1997). *Firesetting: Addressing Offending Behaviour.* Redcar and Cleveland Psychological Service, Redcar, Cleveland.

Murphy, G. H., & Clare, C. (1996). Analysis of motivation in people with mild learning disabilities (mental handicap) who set fires. Psychology, *Crime and Law*, 2(3): 153-164. https://doi.org/10.1080/10683169608409774

Murphy, M. K., Black, N. A., Lamping, D. L., McKee, C. M., Sanderson, C. F. B., Askham, J., et al. (1998). Consensus development methods and their use in clinical guideline development. *Health Technol Assess*, 2, 1–88. https://doi.org/10.3310/hta2030

O' Ciardha, C., Tyler, N., & Gannon, T. A. (2015). A practical guide to assessing adult firesetters' fire-specific treatment needs using the four factor fire scales. *Psychiatry*, 78 (4): 293-304. https://doi.org/10.1080/00332747.2015.1061310

Sigelman, C. K., Budd E. C., Spanhel, C. L., & Schoenrock, C. J. (1981). Asking questions of retarded persons: a comparison of yes–no and either–or formats. *Applied Research in Mental Retardation,* 2, 347–57. https://doi.org/10.1016/0270-3092(81)90029-1

Taylor, J. L., Robertson, A., Thorne, I., Belshaw, T., & Watson, A. (2006). Responses of female fire-setters with mild and borderline intellectual disabilities to a group intervention. *Journal of Applied Research in Intellectual Disabilities*, 19(2), 179-190. https://doi.org/10.1111/j.1468-3148.2005.00260.x

Taylor, J. L., Thorne, I., Robertson, A., & Avery, G. (2002). Evaluation of a group intervention for convicted arsonists with mild and borderline intellectual disabilities. *Criminal Behaviour and Mental Health*, 12(4), 282-293. https://doi.org/10.1002/cbm.506

Taylor, J.L. & Thorne, I. (2005). *Northgate Firesetter Risk Assessment*. Unpublished manual: Northumberland, Tyne & Wear NHS Foundation Trust.

Taylor, J.L., Thorne, I., & Slavkin, M. (2004). *Treatment of firesetters*. In. W.R. Lindsay, J.L. Taylor, & P. Sturmey (Eds.) Offenders with Developmental Disabilities. (pp. 221-240). Chichester: Wiley.

Walker, A. M., & Selfe, J. (1996). The Delphi method: a useful tool for the allied health researcher. *British Journal of Therapy and Rehabilitation*, 3(12), 677-681. https://doi.org/10.12968/bjtr.1996.3.12.14731

Table 1

Relevant experience

Experience	Percentage of participants working with adults with intellectual and other developmental disabilities	Percentage of participants working with adults who set fires
Less than 1 year	5.3	10.5
1-5 years	21.1	26.3
6-10 years	10.5	26.3
11-20 years	31.6	31.6
Over 20 years	31.6	5.3

Note. N = 19.

Table 2

Preferred length of time for assessment

Preferred time in minutes	**Percentage of participants**
5-10	5.3
10-20	15.8
20-30	36.8
30-40	5.3
40-50	5.3
50-60	15.8

Note. N = 16.

Table 3

Preferred number of response options

Preferred number of responses	Percentage of participants
2	0
3	31.6
4	21.1
5	36.8
6	0
7	5.3
More than 7	5.3

Note. N = 19

Table 4

Expert ratings

Item	Percentage of participants providing rating (n)		
	Not at all complex	A little complex	Far too complex
The Identification with Fire Questionnaire			
Fire is an important part of my identity (n=19)	0 (0)	47.4 (9)	52.6 (10)
Fire is an important part of me (n=17)	23.5 (4)	52.9 (9)	23.5 (4)
*Fire is very important to me (n=15)	80 (12)	20 (3)	0 (0)
I don't need fire (n=19)	31.6 (6)	47.4 (9)	21.1 (4)
I do not need fire in my life (n=17)	64.7 (11)	35.3 (6)	0 (0)
Fire is almost part of my personality (n=19)	10.5 (2)	57.9 (11)	31.6 (6)
Fire is a part of who I am (n=17)	35.3 (6)	52.9 (9)	11.8 (2)
I would describe myself as someone who sets fires (n=15)	46.7 (7)	53.3 (8)	0 (0)
If I never saw another fire again it wouldn't bother me (n=19)	36.8 (7)	42.1 (8)	21.1 (4)
If I did not see another fire again, I would be ok (n=17)	47.1 (8)	52.9 (9)	0 (0)
*I would be ok if I never saw a fire again (n=15)	86.7 (13)	13.2 (2)	0 (0)
*Fire is an important part of my life (n=19)	89.5 (17)	5.3 (1)	5.3 (1)
*Fire is a big part of my life (n=17)	88.2 (15)	11.8 (2)	0 (0)
I don't know who I am without fire (n=19)	26.3 (5)	47.4 (9)	26.3 (5)
Fire makes me who I am (n=17)	58.8 (10)	35.3 (6)	5.9 (1)
*I need fire in my life (n=19)	89.5 (17)	5.3 (1)	5.3 (1)
*I need fire in my life (n=17)	88.2 (15)	11.8 (2)	0 (0)
Without fire, I am nobody (n=19)	47.4 (9)	47.4 (9)	5.3 (1)
Fire is a big part of who I am (n=17)	47.1 (8)	47.1 (8)	5.9 (1)
Fire is a part of me (n=19)	47.4 (9)	47.4 (9)	5.3 (1)
I am not me without fire (n=17)	35.3 (6)	29.4 (5)	35.3 (6)
I am nobody without fire (e.g. nobody notices me) (n=15)	40 (6)	53.3 (8)	6.7 (1)
I have to have fire in my life (n=19)	78.9 (15)	15.8 (3)	5.3 (1)
*I must have fire in my life (n=17)	82.4 (14)	17.6 (3)	0 (0)
The Fire Attitudes Scale			
*Most people carry a box of matches or a lighter around (n=19)	89.5 (17)	10.5 (2)	0 (0)
*Most people carry a lighter with them (n=17)	88.2 (15)	11.8 (2)	0 (0)

*People often set fires when they are angry (n=19)	84.2 (16)	15.8 (3)	0 (0)
*People often set fires when they are angry (n=17)	94.1 (16)	5.9 (1)	0 (0)
*I would like to work as a fireman (n=19)	100 (19)	0 (0)	0 (0)
*I would like to work as a firefighter (n=17)	94.1 (16)	5.9 (1)	0 (0)
The best thing about fire is watching it spread (n=19)	68.4 (13)	31.6 (6)	0 (0)
*I like watching fires get bigger (n=17)	94.1 (16)	5.9 (1)	0 (0)
I have never put a fire out (n=19)	78.9 (15)	15.8 (3)	5.3 (1)
*I have put a fire out (n=1)	94.1 (16)	5.9 (1)	0 (0)
I know a lot about how to prevent fires (n=19)	36.8 (7)	52.6 (10)	10.5 (2)
*I know a lot about how to stop a fire (n=17)	88.2 (15)	11.8 (2)	0 (0)
Setting just a small fire can make you feel a lot better (n=19)	63.2 (12)	36.8 (7)	0 (0)
*Setting a small fire can make you feel better (n=17)	94.1 (16)	5.9 (1)	0 (0)
Fires can easily get out of control (n=19)	73.7 (14)	26.3 (5)	0 (0)
*I can stop a fire from getting too big (n=17)	94.1 (16)	5.9 (1)	0 (0)
*I get bored very easily in my spare time (n=19)	89.5(17)	10.5 (2)	0 (0)
*I get bored easily (n=17)	100 (17)	0 (0)	0 (0)
People who set fires should be locked up (n=19)	78.9 (15)	21.1 (4)	0 (0)
*People who set fires should be sent to prison (n=17)	88.2 (15)	11.8 (2)	0 (0)
When you're with your mates you act now and think later (n=19)	31.6 (6)	57.9 (11)	10.5 (2)
When you are with your friends, you do not think about what you are doing (n=17)	23.5 (4)	70.6 (12)	5.9 (1)
*I often copy what my friends do without thinking (n=15)	80 (12)	20 (3)	0 (0)
If you've got problems, a small fire can help sort them out (n=19)	73.7 (14)	26.3 (5)	0 (0)
*If you have problems, a small fire can help you sort them out (n=17)	82.4 (14)	17.6 (3)	0 (0)
Most families have had a fire accident at home (n=19)	68.4 (13)	26.3 (5)	5.3 (1)
Most people have had an accident at home that involved fire (n=17)	76.5 (13)	17.6 (3)	5.9 (1)
*Most people have had an accident at home/in hospital that involved fire (n=15)	86.7 (13)	13.3 (2)	0 (0)
Parents should spend money on buying a fire extinguisher (n=19)	63.2 (12)	36.8 (7)	0 (0)
*Parents/carers should spend money on buying a fire extinguisher (n=17)	88.2 (15)	11.8 (2)	0 (0)
Most people have set a few small fires just for fun (n=19)	68.4 (13)	31.6 (6)	0 (0)
*Most people have set a small fire for fun (n=17)	88.2 (15)	11.8 (2)	0 (0)
I usually go along with what my mates decide (n=19)	68.4 (13)	31.6 (6)	0 (0)
I usually follow what my friends do (n=17)	76.5 (13)	23.5 (4)	0 (0)
*I usually copy what my friends do (n=15)	93.3 (14)	6.7 (1)	0 (0)
*Playing with matches can be very dangerous (n=19)	100 (19)	0 (0)	0 (0)

*Playing with a lighter can be dangerous (n=17)	94.1 (16)	5.9 (1)	0 (0)
Most people have been questioned about fires by the police (n=19)	68.4 (13)	31.6 (6)	0 (0)
Most people have been questioned about fire by the police (n=17)	64.7 (11)	35.3 (6)	0 (0)
The police talk to lots of people about setting fires (n=15)	73.3 (11)	26.7 (4)	0 (0)
They should teach you about fire prevention at school (n=19)	52.6 (10)	47.4 (9)	0 (0)
*They should teach you how to stop fires at school (n=17)	94.1 (16)	5.9 (1)	0 (0)
Most people's friends have lit a fire or two (n=19)	68.4 (13)	31.6 (6)	0 (0)
*Most people's friends have started a fire or two (n=17)	82.4 (14)	17.6 (3)	0 (0)
The Fire Interest Rating Scale			
*Having a box of matches in your pocket (n=18)	83.3 (15)	11.1 (2)	5.6 (1)
*Having a lighter in my pocket (n=15)	86.7 (13)	13.3 (2)	0 (0)
Watching an ordinary coal fire burn in a grate (n=18)	33.3 (6)	50 (9)	16.7 (3)
*Watching a fire burn in a fireplace (n=15)	86.7 (13)	13.3 (2)	0 (0)
*Watching a bonfire outdoors, like on bonfire night (n=18)	88.9 (16)	11.1 (2)	0 (0)
*Watching a bonfire on fireworks night (n=15)	86.7 (13)	13.3 (2)	0 (0)
*Seeing firemen get their equipment ready (n=18)	83.3 (15)	16.7 (3)	0 (0)
Seeing a firefighter put their jacket on, put their helmet on and get their water hose out (n=15)	73.3 (11)	26.7 (4)	0 (0)
*Seeing a firefighter put their uniform on (e.g. helmet) (n=15)	100 (15)	0 (0)	0 (0)
*Watching a fire engine come down the road (n=18)	94.4 (17)	5.6 (1)	0 (0)
*Watching a fire engine come down the road (n=15)	86.7 (13)	13.3 (2)	0 (0)
Striking a match to light a cigarette (n=18)	66.7 (12)	27.8 (5)	5.6 (1)
*Using a lighter to start a cigarette (n=15)	80 (12)	13.3 (2)	6.7 (1)
*Watching a house burn down (n=18)	94.4 (17)	5.6 (1)	0 (0)
*Watching a house burn down (n=15)	86.7 (13)	12.3 (2)	0 (0)
Going to a police station to be questioned about fire (n=18)	72.2 (13)	27.8 (5)	0 (0)
Being asked about fire at a police station (n=15)	73.3 (11)	26.7 (4)	0 (0)
Being questioned by the police about a fire that has happened in the neighbourhood (n=15)	66.7 (10)	33.3 (5)	0 (0)
*Watching people run from a fire (n=18)	88.9 (16)	11.1 (2)	0 (0)
*Watching people run from a fire (n=15)	86.7 (13)	13.3 (2)	0 (0)
*Watching a person with his clothes on fire (n=18)	88.9 (16)	11.1 (2)	0 (0)
*Watching a person with his/her clothes on fire (n=15)	86.7 (13)	13.3 (2)	0 (0)
Striking a match to set fire to a building (n=18)	66.7 (12)	21.8 (5)	5.6 (1)
*Using a lighter to set fire to a building (n=15)	86.7 (13)	13.3 (2)	0 (0)
Seeing a hotel on fire in the TV news (n=18)	72.2 (13)	22.2 (4)	5.6 (1)

*Seeing a hotel on fire in the TV news (n=15)	86.7 (13)	13.3 (2)	0 (0)
Seeing firemen hosing a fire (n=18)	72.2 (13)	16.7 (3)	11.1 (2)
*Seeing a firefighter use water to put a fire out (n=15)	86.7 (13)	13.3 (2)	0 (0)
Giving matches back to someone (n=18)	66.7 (12)	22.2 (4)	11.1 (2)
*Giving a lighter back to someone (n=15)	86.7 (13)	13.3 (2)	0 (0)

Note. *Those items that reached 80% consensus for being 'not at all complex'. The first row for each questionnaire item reports the results of round one. The following rows report the results of subsequent rounds.

Appendix A.

Adapted Firesetting Assessment

[INSERT APPENDIX A]