

Accepted Manuscript

British Journal of General Practice

Recent GP consultation before death by suicide in middle-aged men: a national consecutive case series study

Mughal, Faraz; Bojanić, Lana; Rodway, Cathryn; Graney, Jane; Ibrahim, Saied; Quinlivan, Leah; Steeg, Sarah; Tham, Su-Gwan; Turnbull, Pauline; Appleby, Louis; Webb, Roger; Kapur, Navneet

DOI: <https://doi.org/10.3399/BJGP.2022.0589>

To access the most recent version of this article, please click the DOI URL in the line above.

Received 27 November 2022

Revised 12 February 2023

Accepted 28 February 2023

© 2023 The Author(s). This is an Open Access article distributed under the terms of the Creative Commons Attribution 4.0 License (<http://creativecommons.org/licenses/by/4.0/>). Published by British Journal of General Practice. For editorial process and policies, see: <https://bjgp.org/authors/bjgp-editorial-process-and-policies>

When citing this article please include the DOI provided above.

Author Accepted Manuscript

This is an 'author accepted manuscript': a manuscript that has been accepted for publication in British Journal of General Practice, but which has not yet undergone subediting, typesetting, or correction. Errors discovered and corrected during this process may materially alter the content of this manuscript, and the latest published version (the Version of Record) should be used in preference to any preceding versions

Title page

British Journal of General Practice

Manuscript type. Research article

Manuscript title. Recent GP consultation before death by suicide in middle-aged men: a national consecutive case series study

Faraz Mughal, Lana Bojanić, Cathryn Rodway, Jane Graney, Saied Ibrahim, Leah Quinlivan, Sarah Steeg, Su-Gwan Tham, Pauline Turnbull, Louis Appleby, Roger T Webb, Nav Kapur

Corresponding author. Dr Faraz Mughal MPhil, FRCGP, GP and NIHR Doctoral Fellow, School of Medicine, Keele University; Honorary Clinical Research Fellow, Division of Psychology and Mental Health, University of Manchester; affiliate, NIHR Greater Manchester Patient Safety Translational Research Centre, School of Medicine, Keele University. 0000-0002-5437-5962

Lana Bojanić, MSc, Research Assistant and Doctoral Candidate, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester. [0000-0003-2067-2966](https://orcid.org/0000-0003-2067-2966)

Cathryn Rodway, MA, Research Associate, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester. [0000-0003-0007-0124](https://orcid.org/0000-0003-0007-0124)

Jane Graney, MSc, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester.

Saied Ibrahim, PhD, Research Fellow, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester. [0000-0002-2657-8834](https://orcid.org/0000-0002-2657-8834)

Leah Quinlivan, PhD, Research Fellow, National Institute for Health and Care Research Greater Manchester Patient Safety Translational Research Centre, Manchester Academic Health Science Centre, Centre for Mental Health and Safety, Division of Psychology and Mental Health, School of Health Sciences, University of Manchester. 0000-0002-3944-3613

Sarah Steeg, PhD, NIHR Three Schools Mental Health Research Fellow, Centre for Mental Health and Safety, Division of Psychology and Mental Health, School of Health Sciences, University of Manchester. [0000-0002-7935-1414](https://orcid.org/0000-0002-7935-1414)

Su-Gwan Tham, BSc, MRes, Research Associate, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester. 0000-0003-2526-817X

Pauline Turnbull, PhD, Project director, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester. [0000-0003-0708-0608](tel:0000-0003-0708-0608)

Louis Appleby, MD, FRCPsych, Professor of Psychiatry, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety, School of Health Sciences, University of Manchester.

Roger T Webb, PhD, Professor of Mental Health Epidemiology, National Institute for Health and Care Research Greater Manchester Patient Safety Translational Research Centre, Manchester Academic Health Science Centre, Centre for Mental Health and Safety, Division of Psychology and Mental Health, School of Health Sciences, University of Manchester. 0000-0001-8532-2647

Nav Kapur, MD, FRCPsych, Professor of Psychiatry and Population Health, National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH), Centre for Mental Health and Safety; Manchester Academic Health Sciences Centre; Greater Manchester Mental Health NHS Foundation Trust; NIHR Greater Manchester Patient Safety Translational Research Centre School of Health Sciences, University of Manchester. 0000-0002-3100-3234

Accepted Manuscript – BJGP – BJA:2022.1589

How this fits in

Preventing suicide in middle-aged men is a global priority. In this national case series study, we found that 43% of middle-aged men who died by suicide had a final GP consultation in the preceding three months, and of these men, over half presented with a mental health problem. Men who had recent GP contact before suicide were more likely to have self-harmed in the three months prior compared to men who had no recent GP contact. Men who had a current physical illness, recent history of self-harm, attended for a mental health problem, and experienced recent work-related problems, were more likely to consult with their GP shortly before dying by suicide. GPs and primary care clinicians should be alert to these clinical factors that may be proximal to suicide, and in turn, offer personalised holistic care.

Abstract

Background

Reducing suicide risk in middle-aged men (40-54) is a national priority. People have often presented to their GP within three months before suicide thus highlighting an opportunity for early intervention.

Aim

To describe the sociodemographic characteristics and identify antecedents in middle-aged men who recently consulted a GP before dying by suicide.

Design and setting

This study was a descriptive examination of suicide in a national consecutive sample of middle-aged men in 2017 in England, Scotland, and Wales.

Methods

We obtained general population mortality data from the Office for National Statistics and National Records for Scotland. We collected information about antecedents considered relevant to suicide from data sources. Logistic regression examined associations with final recent GP consultation. We consulted men with lived experience during the study.

Results

In 2017, a quarter (n=1516) of all suicide deaths were in middle-aged men. Data were attained on 242 men: 43% had their last GP consultation within three months of suicide; and a third of these men were unemployed and nearly half were living alone. Men who saw a GP recently before suicide were more likely to have had recent self-harm and work-related problems than men who hadn't. Having a current major physical illness, recent self-harm, presenting with a mental health problem, and recent work-related issues was associated with having a last GP consultation close to suicide.

50 Conclusion

51

52 We identified clinical factors that GPs should be alert to when assessing middle-aged
53 men. Personalised holistic management may have a role in preventing suicide in these
54 individuals.

55

56

57 Keywords: Suicide, men, general practice, family practice, General Practitioners,
58 primary care

59

60

61

62

63

64

65

66

67

68

69

70

71

72

73

74

75

76

77

78

79

80

81

82

83

84

85

86

87

88

89

90

91

92

93

94

95

96

97

98

99 **Background**

100

101 In the UK, men aged 40-54 have the highest age-specific suicide rate.(1) There are
102 complex interrelated factors that are associated with suicide in these men such as
103 economic pressures, relationship difficulties, and social isolation.(2, 3, 4) Reducing
104 suicide risk in middle-aged men is a national policy priority.(5) Whilst reducing suicide
105 risk in people who contact mental health services is a key preventive focus, many
106 people do not access these services, and so primary care has an important role in
107 supporting people at risk of suicide.(6)

108

109 A study found that among people who died by suicide, 41% had contact with primary
110 care services within three months before they died; and 16%, one-week beforehand.(7)
111 Between 2003-2005 approximately 78% of final GP consultations occurred within three
112 months before suicide; and GPs describe reviewing and altering mental health
113 medication during this period.(8, 9) GPs can identify and support middle-aged men who
114 present in acute distress and/or suicidal crisis, especially in the three month window
115 before suicide.(10, 11) Research is lacking about the characteristics and antecedents of
116 men who died by suicide and had 'recent contact' (within three months) with a GP
117 before suicide.(12, 13)

118

119 We aimed to describe the sociodemographic characteristics and behavioural and clinical
120 antecedents in middle-aged men whose final GP consultation was within three months
121 before suicide. We compared medications prescribed between men with recent GP
122 contact and those who had a GP consultation more than three months before suicide.
123 We explored what antecedents may be associated with final recent GP contact. By
124 understanding clinical characteristics of men in the recent contact group, potential
125 targets for GP intervention can be identified.

126

127

128 **Method**

129

130 *Study population*

131

132 In this national case series study detailed information was collected about men aged 40-
133 54 years who died by suicide (including probable suicide) between 1st January 2017-
134 31st December 2017 in England, Scotland, and Wales. 'Middle-aged' was defined as ages
135 40-54 years.

136

137 *General population mortality data*

138

139 We received general population mortality data on men who died by suicide for deaths
140 registered in England and Wales from the Office for National Statistics (ONS) and for
141 deaths registered in Scotland, from the National Records for Scotland (NRS). As is
142 standard for suicide research, we included deaths receiving a conclusion of suicide or
143 intentional self-harm or events of undetermined intent (open verdict) by an HM coroner
144 (England and Wales) or by a Procurator Fiscal (Scotland) when a death is registered.
145 Deaths with International Classification of Diseases, Tenth Revision (ICD-10) codes X60-
146 X84, Y10-Y34 (excluding Y33.9) and Y87 were included.(14) Deaths that were

147 summarised by narrative conclusion at coronial inquest were included if ONS
148 procedures applied one of the ICD-10 codes listed above in England and Wales only.

149
150 *Sample*

151
152 In 2017, 1,516 men aged 40-54 died by suicide in England, Scotland, and Wales. We
153 aimed to obtain information on the antecedents of suicide into these deaths from official
154 investigations on a stratified, random sample of 20% of these men. We sampled a fifth
155 of all cases to ensure that sufficient data were obtained and that our research team was
156 adequately resourced to conduct the investigation. This 20% sample was stratified
157 according to the proportion of deaths in each of these groups: 1) by 5-year age band
158 (40-44, 45-49 and 50-54) within the broader 40-54 years range and 2) by country
159 (England, Wales, and Scotland). Using the SPSS random allocator function, we selected
160 the sample from the total number of deaths by suicide that we had been notified by
161 national data providers at the time of sampling (n=1,486). In total, we sampled 288
162 (19%) middle-aged men. We obtained information about the circumstances
163 surrounding their death, the stressors close to suicide, and their contact with primary
164 care from the data sources that are described below.

165
166 *Data sources*

167
168 *Coronial inquest hearings/files or police death reports*

169
170 Audio recordings of coronial inquest proceedings were requested from senior coroners
171 in the jurisdictions of all sampled deaths in England and Wales. If unavailable, inquest
172 depositions or statements were requested. Redacted police death reports were
173 requested from the Crown Office and Procurator Fiscal Service (COPFS) for all sampled
174 deaths that occurred in Scotland. Information was attained for 228 (79%) of the 288
175 suicide deaths: in 12 deaths the coroner or equivalent was unable (n=5) or did not wish
176 to provide the data (n=7); for 48 deaths data were not returned on time.

177
178 *National Confidential Inquiry into Suicide and Safety in Mental Health (NCISH)*
179 *data*

180
181 The NCISH collects data on a complete UK-wide consecutive case-series of people who
182 died by suicide within one year of being seen by mental health services. Detailed NCISH
183 data collection methods have been published.⁽¹⁵⁾ NCISH data were obtained for
184 86/288 (30%) of cases.

185
186 *NHS serious incident reports*

187
188 Where a patient suicide was identified from NCISH data, a copy of the serious incident
189 report about factors that led to the suicide was requested from the medical director of
190 the treating NHS trust/Health Board. Reports from 68 deaths (24%) were obtained. The
191 deaths of 12 men did not meet organisational review criteria, and data about six deaths
192 were not returned on time.

193
194 *Criminal justice system reports*

195

196 In England and Wales, the Prison and Probations Ombudsman (PPO) release
197 independent Fatal Incident investigation reports of deaths by apparent suicide in
198 custody. The [PPO website](#) was searched for reports for men who died in custody.
199

200 In Scotland, certain types of death are investigated at Fatal Accident Inquiries (FAI),
201 including deaths in prisons. The judgements of FAIs are published on the [Scottish
202 Courts and Tribunals \(SCT\) website](#). The SCT website was searched to locate FAIs
203 relating to suicide in men who died in custody. Three reports of suicides were identified
204 across England, Wales, and Scotland.
205

206 *Procedures*

207

208 Information about antecedents of suicide were extracted using a pre-defined proforma
209 informed by literature and PPI, and then transferred into a standardised database for
210 aggregate analysis. Information was collected on demographic factors (relationship
211 status, employment status, living circumstances), medical history (physical health
212 conditions, alcohol misuse, illicit drug use), psychiatric history (psychiatric disorders,
213 medication), disclosure of suicidal ideas and/or intent, history of self-harm, and recent
214 events (problems with family, work, finance, or accommodation in the 3 months prior to
215 death). The last known contact with GPs and secondary care (emergency department
216 and mental health) was recorded.
217

218 We recorded factors when they were referred to in any data source as having been
219 present in the man's life at any time, or specifically in the three months prior to death
220 (definition of 'recent'). Reference to an antecedent factor (definitions in Supplementary
221 Table 1) at an investigation suggests that it was seen as relevant to the death.
222

223 To ensure interrater reliability of data extraction approximately a tenth of cases (n=30)
224 were reviewed by JG, CR, SGT and a Fleiss' Kappa reliability test performed.(16) Initial
225 levels of agreement were 58-100%. Upon disagreement information was independently
226 re-evaluated and discussed until agreement reached: concordance increased to 100%.
227

228 *Patient and public involvement (PPI)*

229

230 Three male members of the Mutual Support 4 Mental Health Research PPI group with
231 lived experience of suicidal distress informed the development of the data extraction
232 pro-forma and contributed to interpretation of findings.
233

234 *Statistical analysis*

235

236 If an antecedent was not mentioned in a data source, we assumed that it was unlikely to
237 have been present and it was recorded as absent/not relevant. Pearson's chi-square or
238 Fisher's exact test were used to test for associations between subgroups. Antecedents of
239 men in the recent final GP consultation group prior to suicide were examined using
240 descriptive analysis and compared to men who did not have recent GP contact before
241 suicide, including no GP contact at all. A subgroup analysis comparing medications
242 prescribed in men with a recent GP contact versus men whose GP consult was more
243 than three months prior to death was conducted. Univariate logistic regression models
244 were initially fitted with final recent GP consultation before death by suicide as the

245 outcome variable. A multivariable model was then generated using a backwards
246 elimination variable selection approach: the variable with the highest p value was
247 deleted first.(17) Results with $p < 0.05$ (two-sided) were considered statistically
248 significant. Analyses were undertaken in Stata v16.1.(18)

249

250 When reporting results, we suppressed cell counts below three (including zero), in
251 accordance with ONS guidance on disclosure control to protect confidentiality.(19)
252 Results from England, Wales and Scotland are presented as aggregate values.

253

254 **Results**

255

256 The NCISH was notified through ONS and NRS of 5,950 deaths by suicide in England,
257 Wales, and Scotland that occurred between 1st January 2017 and 31st December 2017,
258 with 1,516 deaths among men aged 40-54. This demographic subgroup constituted a
259 quarter (25%) of all deaths by suicide, and more than a third (34%) of all suicides
260 among men. The most common method of suicide was by hanging or strangulation
261 ($n=932$, 61%) followed by self-poisoning ($n=227$, 15%), with a fifth of suicide deaths by
262 self-poisoning being from opioid/opiate substances ($n=45$).

263

264 We obtained information about the sociodemographic characteristics and antecedents
265 of suicide deaths for 242 (84%) of the 288 middle-aged men in our sample. The mean
266 age of these men was 47 (40-54), and they were from England ($n=193$), Scotland
267 ($n=34$), and Wales ($n=15$). Information was attained mostly from coronial inquest
268 hearings or police death reports ($n=228$).

269

270 Ninety percent (219/242) of the men in our sample were registered with a general
271 practice when they died by suicide. The mean age of these men was 47 (40-54). Overall,
272 12% ($n=29$) of the 242 men had a final consultation with a GP during the preceding
273 week prior to death; 31% ($n=76$) between day 8 to 12 weeks, and 27% ($n=66$) more
274 than three months before. In 12% ($n=28$) the time since last GP consultation before
275 suicide was unspecified, and in 18% ($n=43$) last GP contact was not indicated. From
276 men with a known time of final GP consultation (171/242) before suicide, 61% ($n=105$)
277 last consulted a GP within three months (including one week), and 39% ($n=66$) more
278 than three months before suicide.

279

280 Final recent GP contact compared to no recent GP contact before suicide

281

282 Forty three percent (105/242) of men had a last recent GP consultation before dying by
283 suicide. As shown in Table 1, a third of these men were unemployed at that time, and
284 63% were single, divorced, separated, or widowed. Nearly half were living alone. Of
285 men who recently saw a GP before dying by suicide, 8% were from an ethnic minority
286 background.

287

288 Men whose GP consultation before suicide was recent were more likely than men who
289 had no recent GP contact to have had a history of self-harm within three months before
290 suicide and to have had a history of suicidal ideation. They were also significantly more
291 likely to have had a major physical illness (Table 1).

292

293 Men who had a recent GP consultation before suicide were more likely than men who
294 hadn't to have presented to a GP with a mental health or psychological problem (Table
295 1). From the outcomes of last GP consultation (either patient's mental health team
296 informed, GP consultation only, referral to other services, other specified reason, or not
297 applicable), men who had a recent consultation were more likely to have had a GP
298 consultation with no other service involvement and they were more likely to have been
299 referred in their last GP consultation (Table 1).

301 Men who had a recent GP consultation before suicide were more likely to report
302 experiencing recent work-related problems, including being on sick leave. Men with a
303 recent GP consultation were also more likely to have presented to a hospital emergency
304 department during the three months before suicide (Table 1).

306 Prescribed medications in recent compared to more than three-month GP contact 307 groups

309 As listed in Table 2, men who saw a GP recently were more likely to have been
310 prescribed an SSRI/SNRI type anti-depressant, oral antipsychotic, benzodiazepine, or
311 other psychotropic medication by a GP, mental health, or emergency department
312 clinician (see Supplementary Table 2 for medication list) compared to men who saw a
313 GP more than three months before suicide.

315 Clinical predictors of final recent GP contact

317 All significant variables in Table 1 (except GP consultation outcome variables) were
318 entered into model A simultaneously and then insignificant variables were removed
319 individually till the final model was fitted. In model D (n=242), having a major physical
320 illness, recent self-harm, presenting for a mental health or psychological problem, and
321 recent problems in the workplace (including being on sick leave, bullying, or a change
322 or loss of job) was associated with men who had a GP consultation within three months
323 of suicide (Table 3). The fit of models (likelihood ratio test) improved from 66.67
324 (model A), to 63.65 (model D).

326 **Discussion**

328 *Summary*

330 This study found that 43% of men saw a GP within three months of suicide and of these
331 men, over half presented to the GP with a mental health or psychological problem. Men
332 who last saw a GP in the 3 months before suicide were more likely than those who
333 hadn't to have a recent history of self-harm. Men who saw a GP within 3 months of
334 death were more likely to have been taking an SSRI/SNRI antidepressant, oral
335 antipsychotic, benzodiazepine, or other psychotropic medication compared to men who
336 saw a GP more than three months before suicide. Men who had a major physical illness,
337 recent self-harm, presented for a mental health problem, and had work-related issues
338 were more likely to have had recent GP contact before suicide.

340 *Strengths and limitations*

341

342 This is the first study to our knowledge to have examined antecedents of suicide in
343 middle-aged men who had recent GP consultations before suicide. Data predominantly
344 came from coroners who independently obtain evidence from several sources including
345 personal narratives of families, friends, and professionals in contact with men before
346 suicide. We involved men with lived experience improving the credibility of our
347 findings.

348
349 There are however several limitations. This was a case series study thus causal
350 inferences cannot be made about observed relationships. Men who had a major physical
351 illness or work-related problems may have been frequently seeing a GP and therefore
352 more likely to have had a recent GP consult close to suicide. The findings are aggregated
353 for England, Wales, and Scotland; and in turn will be driven by a larger number of
354 suicide deaths in England. Ethnicity was poorly recorded therefore likely
355 underreported. We may have underestimated the true figure for some antecedents,
356 particularly if they were viewed as sensitive (e.g., separation from partner); and other
357 figures may be overestimates as families/friends search for meaning following deaths
358 and may focus on self-perceived relevant factors.(20) Some data may have been
359 influenced by recall bias. We did not specifically collect data on the number or
360 frequency of GP consultations and so were unable to identify patterns in GP
361 consultations before suicide. This study does not tell us about final recent GP
362 consultations during COVID-19.

363
364 *Comparison with existing literature*

365
366 Stanistreet et al compared health service contacts before suicide and accidental deaths
367 in young men (15-39years) in 1995 and found that 56% (45/97) of men who died by
368 suicide had seen a GP in the three months before suicide;(21) we found 43% of men had
369 their final GP consultation within three months before suicide. A Norwegian study of
370 suicide deaths from 2006-2015 found that 33% of men aged 30-44 years and 39% of
371 men 45-59 years had a GP consultation one month before suicide highlighting an
372 opportunity of GP intervention in the month before suicide.(13) Among French men
373 who visited their family doctor during 2019, 24% suffered from a work-related mental
374 health problem:(22) we found men who had recent GP contact before suicide were
375 more likely to have experienced recent work-related stress compared to those who had
376 not, highlighting the importance of enquiring about work-related problems. Risk factors
377 identified in general practice for suicide in men include past self-harm and major life
378 stresses: we found men who had a recent GP consult were more likely to have recently
379 self-harmed.(23)

380
381 *Implications for research and practice*

382
383 Our findings contribute new evidence that GPs should consider when managing middle-
384 aged men. We identified antecedents like current major physical health illness and a
385 recent history of self-harm that are more likely to occur in men who consult a GP three
386 months before suicide than those who hadn't. It is important to examine the
387 associations of antecedents before suicide and the timing of GP contact in the three-
388 month window. Exploring the mental health impact of having a major physical illness or
389 experiencing work-related problems can lead to understanding how GPs can intervene.

390 We need to research acceptable ways GPs can acutely intervene to reduce the chances
391 of suicide in middle-aged men.

392

393 Suicide in a middle-aged man may be a rare occurrence for GPs; but a patient suicide
394 can have a detrimental effect on GPs wellbeing.(24) Men in midlife have the highest
395 suicide rates in the UK, and with COVID-19 exacerbating known suicide risks, it is
396 crucial GPs are alert to identified antecedents that are more likely in men who died by
397 suicide with recent GP contact. Men who present with an identified antecedent such as a
398 mental health problem, recent self-harm, or suicidal ideation should receive a risk
399 formulation, focusing on clinical needs, and tailoring treatment to needs using a
400 strengths-based approach. The 2022 NICE self-harm guidance states that risk
401 stratification into low, medium or high risk to predict future suicide or repetition of self-
402 harm should not be used.(25)

403

404 GPs attempting to implement the 'Making Every Contact Count' approach (delivering
405 healthy lifestyle messages to encourage behaviour change, for example about alcohol
406 intake or stress reduction techniques, and directing to appropriate services)could
407 potentially prevent suicide in midlife men, specifically for men with a major physical
408 illness, recent self-harm, work-related problems, and present with a mental health
409 problem.(6) Longer-term intervention can include referral to mental health services,
410 talking therapies, or third-sector teams; self-help resources; and treatment of
411 underlying mental illness.(10)

412

413 Men prescribed an SSRI/SNRI antidepressant, oral antipsychotic, or benzodiazepine
414 were more likely to have seen their GP within three months of suicide which may
415 indicate that mental health reviews were conducted or there was a deterioration in
416 their mental health. In practice it's important to recognise this and explore self-harm
417 and suicidal thoughts in men taking these medications. GPs may consider allocating
418 more time or arranging follow-up appointments to carefully assess middle-aged men, in
419 particular for those who present with a new mental health problem or work-related
420 problems. Preventing suicide in middle-aged men remains a national priority and GPs
421 have a key role, especially in early assessment and intervention, in a system-wide
422 approach to suicide prevention in these individuals.(26)

423

424

425

426

427

428

429

430

431

432

433

434

435

436

437

438

439 Funding

440

441 Faraz Mughal, Doctoral Fellowship, NIHR300957, is funded by the NIHR for this study.
442 The National Confidential Inquiry into Suicide and Safety in Mental Health is
443 commissioned by the Healthcare Quality Improvement Partnership (HQIP) on behalf
444 of NHS England, NHS Wales, the Scottish Government Health and Social Care
445 Directorate, the Northern Ireland Department of Health, the States of Guernsey and
446 the States of Jersey (funding reference: HQIP NCA 2069). This work was supported by
447 the NIHR Greater Manchester Patient Safety Translational Research Centre (award
448 number: PSTRC-2016-003). The views expressed are those of the authors and not
449 necessarily those of the NIHR, NHS, HQIP, or the UK Department of Health and Social
450 Care.

451

452 *Ethical approval*

453

454 The following approvals were obtained: the University of Manchester Research
455 Governance and Ethics; the National Research Ethics Service (NRES) Committee North
456 West (19/NW/0156) on March 25th 2019; the Health Research Authority Confidential
457 Advisory Group (HRA-CAG; 19/CAG/0109) provided exemption under Section 251 of
458 the NHS Act 2006, enabling access to confidential and identifiable information without
459 informed consent in the interest of improving care on July 29th 2019; and Public Benefit
460 and Privacy Panel for Health and Social Care (PBPP; 1819-0270) on October 11th 2019;
461 and individual NHS Health Boards in Scotland. NHS Trusts and Health Boards in
462 England and Wales were not required to formally confirm capacity and capability.

463

464 Competing interests

465

466 FM was a member of the updated 2022 NICE clinical guideline on self-harm and co-
467 chairs the International Association for Suicide Prevention special interest group in
468 suicide prevention in primary care. LA chairs the National Suicide Prevention Strategy
469 Advisory Group (NSPAG) at the Department of Health and Social Care in England; NK is
470 a member of the Group and is supported by Greater Manchester Mental Health NHS
471 Foundation Trust. NK chaired the 2022 NICE guideline development group for
472 depression in adults and was a topic expert member for the NICE suicide prevention
473 guideline. NK chaired the guideline development group for the NICE guidelines on the
474 longer-term management of self-harm 2011 and was a topic advisor on the 2022 NICE
475 guideline on self-harm.

476

477 Acknowledgements

478

479 The study was carried out as part of the NCISH. We thank the other members of the
480 research team: Alison Baird, James Burns, Huma Daud, Isabelle Hunt, Julie Hall, Rebecca
481 Lowe, Phil Stones, and Nicola Richards. We also offer special thanks to coroners and
482 their staff and administrative staff from NHS Trusts and Health Boards for their
483 invaluable contribution to the study. We would also like to thank members of the
484 MS4MH-R patient and public involvement group affiliated with the NIHR Greater
485 Manchester Patient Safety Translational Research Centre and Centre for Mental Health
486 and Safety, University of Manchester for their contribution to the study design and
487 interpretation of results.

488 References

489
490
491

- 492 1. Office for National Statistics. Suicides in England and Wales: 2021 registrations 2022
493 [Available from:
494 [https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/death](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/suicidesintheunitedkingdom/2021registrations#main-points)
495 [s/bulletins/suicidesintheunitedkingdom/2021registrations#main-points](https://www.ons.gov.uk/peoplepopulationandcommunity/birthsdeathsandmarriages/deaths/bulletins/suicidesintheunitedkingdom/2021registrations#main-points).
496 2. Wong PW, Chan WS, Chen EY et al. Suicide among adults aged 30-49: a psychological
497 autopsy study in Hong Kong. *BMC Public Health*. 2008;8:147.
498 3. Mallon S, Galway K, Rondon-Sulbaran J, et al. When health services are powerless to
499 prevent suicide: results from a linkage study of suicide among men with no service contact
500 in the year prior to death. *Prim Health Care Res Dev*. 2019;20:e80.
501 4. National Confidential Inquiry into Suicide and Safety in Mental Health. Suicide by
502 middle-aged men. The University of Manchester; 2021.
503 5. HM Government. Preventing suicide in England: Fourth progress report of the cross-
504 government outcomes strategy to save lives. 2019.
505 6. Samaritans, Centre for Mental Health. Strengthening the frontline: investing in
506 primary care for effective suicide prevention. 2019.
507 7. Stene-Larsen K, Reneflot A. Contact with primary and mental health care prior to
508 suicide: A systematic review of the literature from 2000 to 2017. *Scand J Public Health*.
509 2019;47(1):9-17.
510 8. Leavey G, Mallon S, Rondon-Sulbaran J, et al. The failure of suicide prevention in
511 primary care: family and GP perspectives - a qualitative study. *BMC psychiatry*.
512 2017;17(1):369.
513 9. Pearson A, Saini P, Da Cruz D, et al. Primary care contact prior to suicide in
514 individuals with mental illness. *Br J Gen Pract*. 2009;59(568):825-32.
515 10. Mughal F, House A, Kapur N, et al. Suicide prevention and COVID-19: the role of
516 primary care during the pandemic and beyond. *Br J Gen Pract*. 2021;71(706):200-1.
517 11. Mughal F, Troya MI, Dikomitis L, et al. Role of the GP in the management of patients
518 with self-harm behaviour: a systematic review. *Br J Gen Pract*. 2020;70(694):e364-e73.
519 12. John A, DelPozo-Banos M, Gunnell D, et al. Contacts with primary and secondary
520 healthcare prior to suicide: case-control whole-population-based study using person-level
521 linked routine data in Wales, UK, 2000-2017. *Br J Psychiatry*. 2020:1-8.
522 13. Hauge LJ, Stene-Larsen K, Grimholt TK, et al. Use of primary health care services prior
523 to suicide in the Norwegian population 2006-2015. *BMC Health Serv Res*. 2018;18(1):619.
524 14. Gunnell D, Bennewith O, Simkin S, et al. Time trends in coroners' use of different
525 verdicts for possible suicides and their impact on officially reported incidence of suicide in
526 England: 1990-2005. *Psychol Med*. 2013;43(7):1415-22.
527 15. National Confidential Inquiry into Suicide and Safety in Mental Health. Annual
528 report: England, Northern Ireland, Scotland, and Wales. 2018.
529 16. Fleiss JL. Measuring nominal scale agreement among many raters. *Psychological*
530 *Bulletin*. 1971;76(5):378-82.
531 17. Chowdhury MZI, Turin TC. Variable selection strategies and its importance in clinical
532 prediction modelling. *Fam Med Community Health*. 2020;8(1):e000262.
533 18. StataCorp. 16.1 ed1985-2019.

534 19. Office for National Statistics. *Policy on protecting confidentiality in tables of birth and*
535 *death statistics*, [Available from:
536 <https://www.ons.gov.uk/methodology/methodologytopicsandstatisticalconcepts/disclosure>
537 [control/policyonprotectingconfidentialityintablesofbirthanddeathstatistics](https://www.ons.gov.uk/methodology/methodologytopicsandstatisticalconcepts/disclosure/control/policyonprotectingconfidentialityintablesofbirthanddeathstatistics).
538 20. Begley M, Quayle E. The lived experience of adults bereaved by suicide: a
539 phenomenological study. *Crisis*. 2007;28(1):26-34.
540 21. Stanistreet D, Gabbay MB, Jeffrey V, Taylor S. The role of primary care in the
541 prevention of suicide and accidental deaths among young men: an epidemiological study. *Br*
542 *J Gen Pract*. 2004;54(501):254-8.
543 22. Rivière M, Plancke L, Leroyer A, et al. Prevalence of work-related common
544 psychiatric disorders in primary care: The French Héraclès study. *Psychiatry Res*.
545 2018;259:579-86.
546 23. Haste F, Charlton J, Jenkins R. Potential for suicide prevention in primary care? An
547 analysis of factors associated with suicide. *Br J Gen Pract*. 1998;48(436):1759-63.
548 24. Saini P, Chantler K, While D, Kapur N. Do GPs want or need formal support following
549 a patient suicide?: a mixed methods study. *Fam Pract*. 2016;33(4):414-20.
550 25. National Institute for Health and Care Excellence. Self-harm: assessment,
551 management and preventing recurrence [NG225] 2022 [Available from:
552 <https://www.nice.org.uk/guidance/ng225>.
553 26. National Institute for Health and Care Excellence. Suicide prevention Quality
554 Standard [QS189] 2019 [Available from: <https://www.nice.org.uk/guidance/qs189>.
555

Table 1. Sociodemographic, behavioural, and clinical characteristics of middle-aged men who died by suicide with a known recent GP consultation before suicide (n=242)

Data items	Recent last GP consultation (n=105) N (%)	Did not have recent last GP consultation (n=137) N (%)	p value
<i>Socio-demographic</i>			
Single	38 (36%)	61 (45%)	0.191
Unemployed	35 (33%)	37 (27%)	0.286
Living alone	49 (47%)	60 (44%)	0.656
Ethnic minority group	8 (8%)	12 (9%)	0.750
<i>Behavioural</i>			
History of self-harm within three months of death	33 (31%)	13 (9%)	<0.001**
History of self-harm more than three months	23 (22%)	38 (28%)	
History of suicidal thoughts	34 (32%)	28 (20%)	0.035*
History of alcohol misuse	37 (35%)	51 (37%)	0.750
History of drug misuse	33 (31%)	41 (30%)	0.802
<i>Clinical</i>			
Major physical illness at time of death	54 (51%)	46 (34%)	0.005**
Respiratory disease	12 (11%)	15 (11%)	0.906
Chronic pain	13 (12%)	9 (7%)	0.119

Musculoskeletal disease	6 (6%)	4 (3%)	0.224 ¹
<i>Psychiatric diagnosis:</i>			
Depressive or anxiety illness	42 (40%)	39 (29%)	0.060
Schizophrenia/delusional disorders	10 (10%)	9 (7%)	0.397
Alcohol or drug misuse	13 (12%)	13 (9%)	0.472
<i>Reasons for last GP contact:</i>			
Mental health or psychological problem	54 (51%)	21 (15%)	<0.001**
Physical health problem	35 (33%)	28 (42%)	0.230
Alcohol and/or drug misuse	7 (7%)	7 (5%)	0.607
<i>Outcome at last GP consult:</i>			
GP consultation only	35 (33%)	29 (21%)	0.033*
Referral	22 (21%)	10 (7%)	0.002**
<i>Last ED attendance within three months</i>			
	23 (22%)	12 (9%)	0.004**
<i>Social events in the three months before suicide:</i>			
Separation from partner	24 (23%)	24 (18%)	0.302
Social isolation	14 (13%)	10 (7%)	0.120

Recent work related problems (including on sick leave)	30 (29%)	15 (11%)	<0.001**
In debt	17 (16%)	18 (13%)	0.504
*p<0.05, **p<0.01, ¹ one-sided Fisher's exact test			

Table 2. Subgroup analysis of prescribed medications in men and the relationship with time of last GP consultation before suicide (n=171)

<u>Data items</u>	Last GP consultation before suicide		χ^2	p value
	GP consultation within three months (n=105)	GP consultation more than three months (n=66)		
<u>Prescribed medications</u>				
SSRI/SNRI and related	56 (53%)	15 (23%)	15.634	<0.001**
Oral antipsychotic	20 (19%)	5 (8%)	4.272	0.039*
Depot antipsychotic	<3 (2%)	4 (6%)		0.156 ¹
Tricyclic antidepressant	7 (7%)	3 (5%)		0.414 ¹
Lithium/mood stabilisers	4 (4%)	3 (5%)		0.551 ¹
Other antidepressants	14 (13%)	8 (12%)	0.053	0.818
Benzodiazepines	15 (14%)	3 (5%)		0.035 ^{1*}
Other psychotropic drugs	27 (26%)	3 (5%)		<0.001** ¹
Opiate for pain relief	14 (13%)	4 (6%)		0.103 ¹
*p<0.05, **p<0.01, ¹ one-sided Fisher's exact test				

Table 3. Results of backwards elimination logistic regression for middle-aged men who died by suicide with final GP consultation before suicide (n=242)

	<u>Model A</u>			<u>Model B</u>			<u>Model C</u>			<u>Model D</u>		
	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value	OR	95% CI	p-value
<i>Constant</i>	0.22	0.13-0.38	<0.001**	0.23	0.14-0.38	<0.001**	0.23	0.14-0.38	<0.001**	0.21	0.13-0.34	<0.001**
History of self-harm within three months	2.53	0.98-6.50	0.054	2.53	0.98-6.49	0.054	2.89	1.27-6.56	0.011*	3.49	1.60-7.61	0.002**
History of self-harm >three months ago	0.55	0.26-1.16	0.116	0.54	0.26-1.15	0.110	0.55	0.26-1.16	0.117			
History of suicidal thoughts	1.15	0.57-2.33	0.690									
Major physical illness	2.62	1.42-4.83	0.002**	2.62	1.42-4.84	0.002**	2.63	1.43-4.84	0.002**	2.39	1.32-4.32	0.004**
Last GP consult for mental health/psychological problem	5.50	2.70-11.20	<0.001**	5.74	2.90-11.36	<0.001**	5.66	2.87-11.15	<0.001**	4.92	2.58-9.37	<0.001**
Recent work-related problems (including on sick leave)	2.99	1.37-6.54	0.006**	2.98	1.37-6.51	0.006**	3.09	1.43-6.67	0.004**	3.07	1.43-6.61	0.004**
Recent ED attendance within three months	1.34	0.48-3.75	0.578	1.34	0.48-3.74	0.576						

*p<0.05, **p<0.01, OR – odds ratio; CI – confidence interval.