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Observational Studies

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Inequalities and inequities in the types of chronic pain services available in areas of differing deprivation across England

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Abstract

Objectives: In England, the prevalence of chronic pain is higher in more deprived compared to less deprived areas. Patients in such areas also experience more severe and disabling pain than those in less deprived areas. However, little is known about whether the distribution of services for chronic pain reflect these ranging levels of need. This study examines how the types of services available for chronic pain patients vary between healthcare providers in England, serving areas of differing deprivation.

Methods: National guidelines regarding primary as well the 8 commonest causes of secondary chronic pain (in the United Kingdom) were used to compile a list of services that have been recommended for supporting chronic pain patients. After searching the websites of 63 randomly selected National Health Service (NHS) Trusts and contacting their pain receptionists and/or secretaries, it was recorded whether the Trusts were providing each of these recommended chronic pain services. Mean Index of Multiple Deprivation 2019 scores were used to compare deprivation levels of areas covered by each NHS Trust.

Results: There was no significant difference in the overall number of types of chronic pain services provided by NHS Trusts serving areas of differing deprivation, but deprived areas were being disadvantaged with regards to specific services. These areas were significantly ($p<0.05$) less likely to have occupational therapy, return-to-work programmes, and hand therapy services. Areas with fewer types of professionals (≤3) in their pain multidisciplinary team were also significantly ($p<0.05$) more deprived than those with more types (>3).

Conclusion: There are significant differences in the provision of certain types of chronic pain services between areas of differing deprivation. Similar research across Europe is recommended to inform policy to combat the widespread chronic pain related health inequalities.

Keywords: chronic pain; health personnel; healthcare status disparities; pain clinics; socioeconomic factors.

Introduction

Socioeconomic disadvantage

Socioeconomic disadvantage can be described at both an individual-level (socioeconomic status (SES)) and an area-level (deprivation). SES is a composite measure which considers an individual's income, education and occupation. However, the standard measure of deprivation of the 32,844 'small areas' in England (average population of 1,500) is the Index of Multiple Deprivation (IMD) which has 7 contributing domains (income, education, employment, health, crime, living environment and barriers to housing/service) [1].

Chronic pain epidemiology

Many chronic diseases are more prevalent amongst those who are socioeconomically disadvantaged [2], and chronic pain is no exception to this. 2017 Health Survey for England [3] revealed that the prevalence of chronic pain is higher in more deprived compared to less deprived areas. Similarly, a 2021 meta-analysis [4] of 45 international studies found that there is a moderate increase in the risk of chronic pain for those of low (OR=1.32; 95% CI: 1.21, 1.44) and medium (OR=1.16; 95% CI: 1.09, 1.23) SES compared to those of high SES.

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Furthermore, patients in deprived areas experience more severe and disabling pain [5–8] as well as suffer greater mental distress [5] compared to their counterparts in less deprived areas. 2017 Health Survey for England [3] found that people who experience high interference chronic pain (pain that moderately or severely limits daily, social and work-related activities, Von Korff Graded Chronic Pain Scale [9]) are twice as likely to live in the most deprived quintile (30%) compared to the least deprived quintile (15%).

Chronic pain service provision in England

In England, healthcare services are provided by NHS England, which is a subdivision of the NHS, a national tax funded healthcare system that is free at the point of delivery. NHS England has organisational units (NHS Trusts) that each serve specific geographical areas. The same area can be served by several Trusts providing different services. The National Institute of Health and Care Excellence (NICE) is the public body of the Department of Health which publishes healthcare guidelines and quality standards.

The National Pain Audit 2010–2014 [10, 11] investigated NHS-provided pain clinics across England and Wales. Among other shortcomings, it found that only 56% of clinics were meeting the minimum multidisciplinary standard (presence of a psychologist, physiotherapist, and physician) and very few clinics were meeting recommended evidence-based waiting times [11]. However, the audit did not report the specific services offered within pain clinics or how the provision of these services varied according to the level of deprivation of an area. The Inverse Care Law [12] states that healthcare services and professionals are often sparse where they are most in need. To our knowledge, no research has been published exploring if the Inverse Care Law [12] applies in the context of services for chronic pain in England and if so, to what extent.

Aim

To examine how the types of services available for chronic pain patients vary between England NHS Trusts, serving areas of differing deprivation.

Methods

Defining ‘ideal’ provision of chronic pain services

Firstly, a list of primary chronic pain services that NHS Trusts should ideally provide was generated. All recommendations made in the management section of NICE guidelines for primary chronic pain [13] excluding the pharmacological therapies (outside main aim of this study), were included in the list. The 3-tier grading system of pain services outlined in NHS England standards for specialised pain services [14] and the types of members for pain multidisciplinary teams (MDTs) recommended in Faculty of Pain Medicine Core Standards for Pain Management Services [15] were also included.

Two refinements were then made to produce the final list of primary chronic pain services that NHS Trusts should ideally provide (Table 1). Psychological therapies were removed because the provider of such services (psychologist) was also on the list. The categories Tier 2 and Tier 3 on the list were merged because of difficulty in determining the level of speciality of a service using chosen data collection methods.

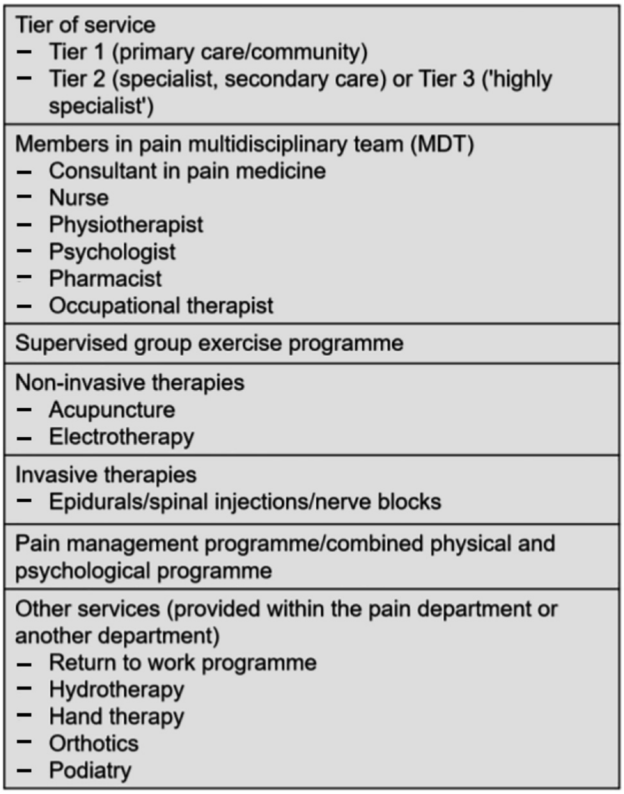
Table 1: Final list of services for primary chronic pain that NHS Trusts should ideally provide.

Tier of service – Tier 1 (primary care/community) – Tier 2 (specialist, secondary care) or Tier 3 ('highly specialist')
Members in pain multidisciplinary team (MDT) – Consultant in pain medicine – Nurse – Physiotherapist – Psychologist – Pharmacist – Occupational therapist
Supervised group exercise programme
Acupuncture

Next, services for patients with secondary chronic pain were added to the list. For this, NICE guidelines on the 8 commonest causes of secondary chronic pain in the UK were considered [16]. These are headache, low back pain and sciatica, rheumatoid arthritis, osteoarthritis, spondyloarthritis, endometriosis, neuropathic pain and irritable bowel syndrome [16]. All pain-related service recommendations, excluding pharmacological therapies and surgical interventions (outside main aim of this study), were included in the list.

One refinement was then made to produce the final list (Table 2); manual therapy was removed since physiotherapists, who most commonly provide this intervention in the NHS, were on the list.

Table 2: Final list of services for primary and secondary chronic pain that NHS Trusts should ideally provide.



Tier of service
- Tier 1 (primary care/community)
- Tier 2 (specialist, secondary care) or Tier 3 ('highly specialist')

Members in pain multidisciplinary team (MDT)
- Consultant in pain medicine
- Nurse
- Physiotherapist
- Psychologist
- Pharmacist
- Occupational therapist

Supervised group exercise programme

Non-invasive therapies
- Acupuncture
- Electrotherapy

Invasive therapies
- Epidurals/spinal injections/nerve blocks

Pain management programme/combined physical and psychological programme

Other services (provided within the pain department or another department)
- Return to work programme
- Hydrotherapy
- Hand therapy
- Orthotics
- Podiatry

Trust selection and data collection

England NHS Trusts from the NHS provider directory [17] were numbered from 1 to 217. Random numbers were then generated, and duplicate numbers were removed as they arose until there were 100 different numbers (representing 46% of England NHS Trusts). Next, numbers corresponding to Trusts that either no longer exist or solely provide mental health or ambulance or limited community services were removed, leaving 63 Trusts. Trust websites were then searched, and it was recorded whether each of the ideal chronic pain services (listed in Table 2) were being provided or not. For 34 Trusts, the website had enough information to determine this. Then pain receptionists and/or secretaries from remaining 29 Trusts were contacted to clarify which services were being provided. Pain receptionists and/or secretaries were contacted because unlike healthcare professionals, they were easily accessible via telephone numbers available on Trust websites. Healthcare professionals would have had to be contacted via email, to which non-response is more likely.

Three Trusts were unreachable so where information about a service was missing from their websites, it was assumed that the service was not provided. The process of trust selection and data collection is summarised in Figure 1.

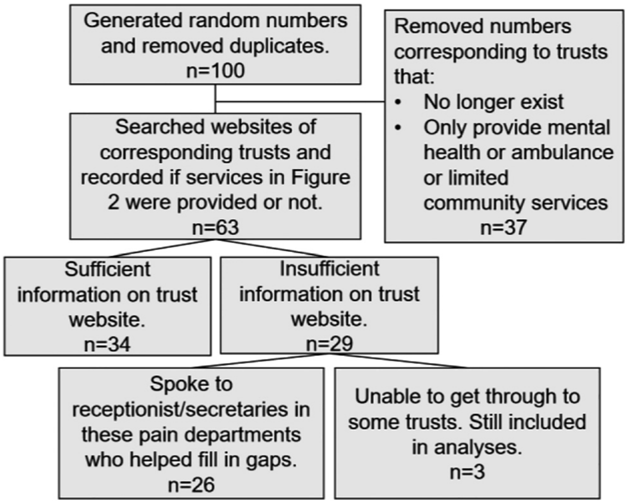


Figure 1: Summary of process of NHS Trust selection and data collection. Data was collected in June and July 2021.

Calculating deprivation scores

Next, deprivation score of the area that each Trust covered was recorded. For this, a mean of the IMD 2019 scores [1] of the 'small areas' that the Trust covered [18] was calculated. Mean was weighted on population size [19].

Tertiary Trusts provide care for their local area as well as highly specialised services for areas beyond this. However, only the IMD 2019 scores of the local 'small areas' were considered in the above calculation. Given that some of these Trusts receive referrals nationally, it was not possible to include IMD 2019 scores of all areas covered by these Trusts. Furthermore, this would not demonstrate the true accessibility of services because access to highly specialised services in tertiary care hides whether there is adequate secondary care service provision locally. Finally, the provision of cordotomy and neuromodulation, two interventions only provided in tertiary Trusts were not evaluated, again making the distinction between secondary and tertiary Trusts unnecessary.

Statistical analysis

Analyses were performed using GraphPad Prism (version 9.1.2 for Windows). Spearman's Correlation Coefficient was calculated to assess the relationship between deprivation level of areas and number of types of chronic pain services provided available. Mann–Whitney U and Kruskal–Wallis tests were used to compare IMD 2019 scores of Trust areas with and without each service in Table 2.

Results

All 63 NHS Trusts were included in the analyses.

Figure 2A shows weak negative (ρ_s=−0.165, 95% CI: −0.403, 0.093) but insignificant (p=0.195) correlation

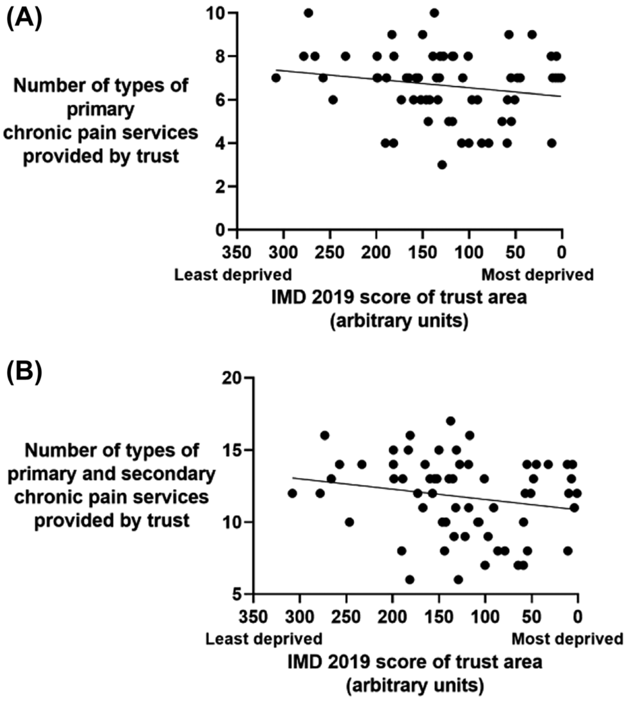


Figure 2: (A) The correlation between the index of multiple deprivation 2019 (IMD 2019) score of an area and the number of types of services for primary chronic pain (out of those in Table 1) the Trust covering it provides (B) The correlation between the IMD 2019 score of an area and the number of types of services for primary and secondary chronic pain (out of those in Table 2) the Trust covering it provides.

between the deprivation level of an area and the number of types of services for primary chronic pain available.

Figure 2B shows that similarly to when primary chronic pain services are considered alone (Figure 2A), there is weak negative (ρ_S=−0.213, 95% CI: −0.444 to 0.044) but insignificant (p=0.093) correlation between the deprivation level of an area and the number of types of services for primary and secondary chronic pain available.

Figure 3A reveals the distribution of deprivation scores of Trusts with different numbers of types of professionals in their pain MDTs. No Trust had just one type of professional. The deprivation scores of Trusts with 2 or 3 types were not significantly different from each other (*U*=29, p=0.157) nor were the scores of Trusts with 4 or 5 or 6 types from each other (*H*=1.692, p=0.429). However, there was a significant difference between the 2 sets – areas served by Trusts with 2 or 3 types of professionals were significantly more deprived than those that were served by Trusts with 4 or 5 or 6 (*U*=265, p=0.014). This is represented in Figure 3B.

However, there was no significant difference between deprivation scores of areas where Trusts met the minimum multidisciplinary standard (presence of a psychologist, physiotherapist and physician) and areas where they did not (*U*=377, p=0.240).

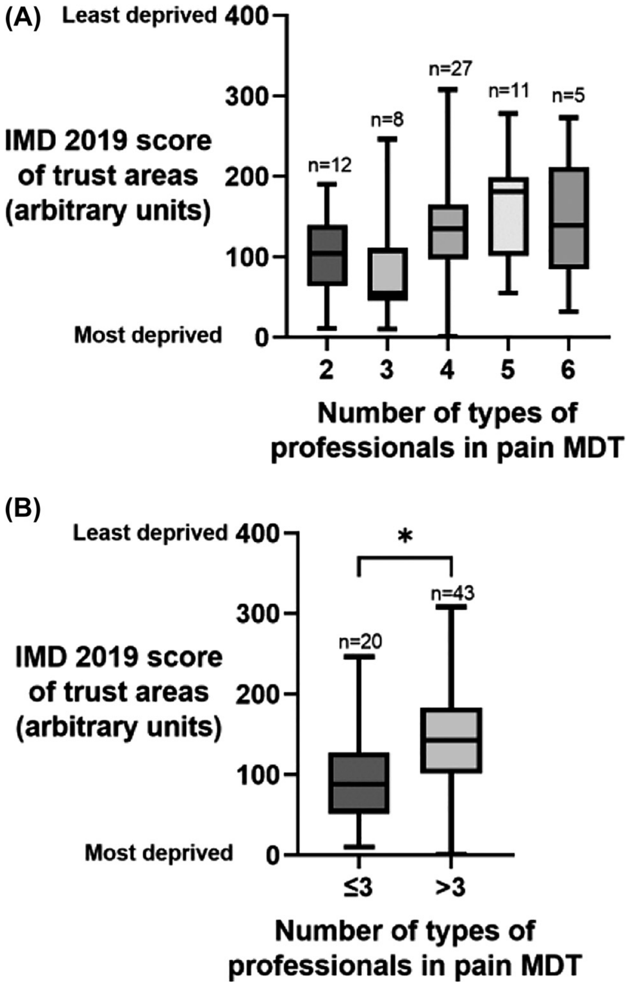


Figure 3: (A) The distribution of index of multiple deprivation 2019 (IMD 2019) scores of areas covered by Trusts with different numbers of types of professionals in their pain multidisciplinary teams (MDTs) (B) The distribution of IMD 2019 scores of areas covered by Trusts with ≤3 types of professionals in their pain multidisciplinary team (MDT) and those with >3.

The majority (75%) of MDTs with 2 types of professionals were made up of consultants and nurses. The majority (75%) with 3 types had consultants, nurses then either psychologists or physiotherapists. No Trusts with 2 or 3 types of professionals had an occupational therapist or pharmacist. Therefore, Trusts that had fewer types of professionals in their pain MDT (and Figure 3B shows that these were the Trusts in more deprived areas) often had consultants and nurses but lacked occupational therapists, pharmacists and then either psychologists or physiotherapists.

Figure 4 shows that areas where the pain MDT did not have an occupational therapist were significantly more deprived than areas that did (*U*=252, p=0.008). This did not

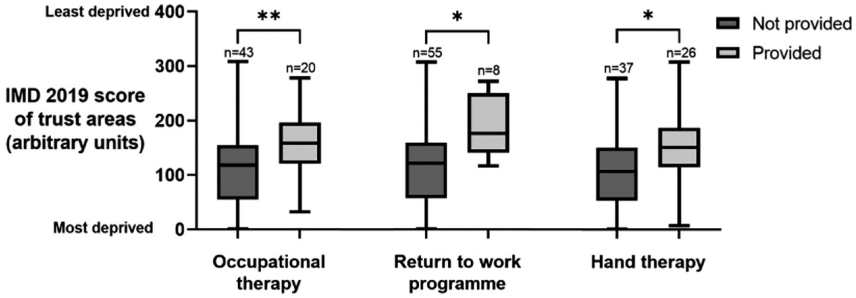


Figure 4: The distribution of index of multiple deprivation 2019 (IMD 2019) scores of areas covered by Trusts that provide occupational therapy, return-to-work programmes and hand therapy compared to those that do not.

apply for any other professional group. However, only 8 out of 63 Trusts had a pharmacist.

The only other services out of the ones in Table 2 where there was a significant difference in deprivation levels between Trusts that provided it and those that did not were return-to-work programmes (*U*=98, p=0.010) and hand therapy (*U*=321, p=0.025) (Figure 4).

Discussion

There was no significant difference in the number of types of services for primary and secondary chronic pain provided by England NHS Trusts, serving areas of differing deprivation (Figure 2A and B). This represents equality since on average, deprived areas have the same number of types of chronic pain services as less deprived areas. However, it does not represent equity, a concept which is distinct to equality. Equity recognises that individuals/sub-groups may have different levels of need and will thus require different amounts of (not equal) resources and opportunities to reach equality in outcomes. An equity approach would therefore suggest that since patients in deprived areas have more severe and disabling pain [5–8] and are at a higher risk of developing chronic pain in the first place [3, 4], they may require more services (not equal) in their area to support them compared to patients in less deprived areas.

Although there was no significant difference in the overall number of types of chronic pain services provided by Trusts serving areas of differing deprivation, deprived areas were still being disadvantaged with regards to specific chronic pain services including the multidisciplinary standard of pain clinics.

The percentage of pain clinics in England and Wales meeting the minimum multidisciplinary standard was 56% at the end of the National Pain Audit [11]. 7 years on from this, our study shows a rise to only 63.5% (for England). Furthermore, it was found that even though deprived areas are equally likely as less deprived areas to meet the minimum multidisciplinary standard, they are still more likely to have fewer types of professionals in their pain MDT than less deprived areas are. Specifically, areas served by Trusts that had ≤3 types of professionals in their MDT were significantly more deprived than those with >3 types (Figure 3B). These findings suggest that the Inverse Care Law [12] applies in the context of chronic pain professionals. This can be interpreted because patients in deprived areas experience more severe and disabling pain [5–8] which would likely require more than one treatment and thus greater multidisciplinary support (not less). To create an equitable pain service, further research should be done to understand why Trusts in deprived areas are being disadvantaged with regards to chronic pain professionals and what can be done to help in this aspect. A useful starting point is that out of the 6 recommended professionals (see Table 2), these Trusts were likely to have pain consultants and nurses but unlikely to have an occupational therapist, pharmacist and then one of physiotherapist or psychologist.

Trusts serving deprived areas were equally likely as those serving less deprived ones to have all of the other services for chronic pain (that are listed in Table 2) apart from occupational therapy, return-to-work programmes, and hand therapy. Areas where there was no provision of these services were significantly more deprived than areas with provision of them (Figure 4). But future improvements to the nation's pain services should not just be based on simply bringing deprived areas up to scratch with less deprived areas. Commissioners should not assume that deprived populations require and respond to the same types of chronic pain services as less deprived ones. For example, some studies [20, 21] have found that the association between SES and chronic pain can in part be explained by psychological factors (such as depressive symptoms and pain-catastrophising). This could mean that patients in deprived areas need more psychological support than those in less deprived areas. Therefore, another important step in creating more equitable provision of services for chronic pain is through further research that can aid understanding of the mechanisms of chronic pain specifically in deprived populations (which is currently understudied) and identify which interventions would be most helpful to this subgroup.

Limitations and future work

Websites were used for data collection which may not be regularly updated. However, they provided an important dimension to the results. Patients who are looking to access the pain service and General Practitioners wanting to refer patients often use the websites. Therefore, an inadequate website could reduce the use of services despite them being available.

Guidelines on only the eight commonest causes of secondary chronic pain were considered.

Only the provision of services was recorded; their quality or effectiveness was not investigated. Future work could use validated pain severity and quality-of-life questionnaires pre- and post-treatment to evaluate outcomes in areas of differing deprivation.

Additionally, future research and practice interventions should consider that a service being available does not necessarily mean that it is accessible. For example, a group at a tertiary paediatric chronic pain service [22] found that proportionately fewer children from deprived areas were being referred to the service. These children were also less likely to attend appointments. Furthermore, the National Pain Audit found that low numbers of non-English speaking patients were accessing the pain services.

Despite the above limitations, this study still makes an important first step in uncovering some of the inequalities and inequities that exist in the provision of chronic pain services in England. This research hopes to prompt further investigation into the true magnitude and impact of these issues and consequent improvement to the provision of chronic pain services in England, particularly in deprived areas.

Similar research across Europe is recommended to inform effective policy decisions to combat the widespread health disparities in chronic pain [4–8].

Conclusions

There was no significant difference in the number of types of services for primary and secondary chronic pain provided by England NHS Trusts, serving areas of differing deprivation. However, there are significant inequalities and inequities in the provision of certain types of chronic pain services (including multidisciplinary levels of pain clinics) between areas of differing deprivation. Further studies should assess the true magnitude and impact of these inequalities and inequities. Investigation of the effectiveness of and engagement with specific services for chronic pain in patient subgroups from areas of differing deprivation is also recommended. Findings from these studies could then facilitate iterative improvements to chronic pain services based on local need.

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Informed consent: Not applicable.
Ethical approval: Ethical approval was not sought because this was an evaluation of existing services.

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