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Understanding and supporting the health literacy of young men in prison: a mixed-methods study

Abstract

Purpose

Prisons offer a public health opportunity to access a group with multiple and complex needs and return them to the community with improved health. However, prisons are not conducive to optimal health and there are few frameworks to guide efforts. This study aims to generate insights into health literacy across a young adult prison population, specifically examining the level of limitations and the barriers and characteristics associated with these limitations.

Design/methodology/approach

The study took place in a single prison in England for young adult men aged 18-21 years old. A mixed-methods design was adopted with 104 young men completing a quantitative survey and qualitative semi-structured interviews with 37 young men.

Findings

Almost three-quarters (72%, n=75) of young men scored as limited in their health literacy. Barriers to improving health literacy included structural restrictions, limited access to formal support, and social and natural disruptions. No demographic characteristics or smoking intentions/behaviours predicted limited health literacy but characteristics of the prison were predictive. Physical problems (sleep, nausea, tiredness and headaches), mental health and wellbeing (anxiety, depression and affect), and somatisation problems were also predictive of limitations.

Practical implications

Prison healthcare services and commissioners should undertake regular health literacy needs assessments to support developments in reducing barriers to healthcare and increasing health improvement efforts. Action also requires greater political will and investment to consider broader action on the wider determinants of (prison) health.

Originality/value

The study provides a framework to understand and guide prison health efforts and highlights attention needed at the level of governments, prison leaders and their health systems.

Keywords: prison health, health literacy, young adulthood, healthy prison, health promotion, disease prevention, health inequality, public health

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Introduction

Health literacy refers to the ability of individuals to gain access to, understand and use information in ways which promote and maintain good health (Nutbeam, 1998). Health literacy has gained importance on the global health agenda (Kickbusch *et al.*, 2013) and is an evolving concept (Sørensen *et al.*, 2012) which not only describes the skills of individuals but also that of professionals, services and policy related constraints/facilitators set by the institutions (Rudd, 2015). Many people experience limitations in their health literacy and one large European study of 8,000 people found that 1 in 2 people (47%) experience limited health literacy, which is related to a number of worsening health outcomes (Sørensen *et al.*, 2015). Health literacy is now established as a determinant of health and one which is modifiable, thereby holding potential to reduce health inequalities (Batterham *et al.*, 2016). Eliminating health literacy barriers is posited as the ‘essential ingredient’ in the effort to increase health equity and reduce health inequalities (Kickbusch *et al.*, 2013).

Over the past few decades, health literacy research has occurred in diverse contexts but few studies have focused on prisons as a context for supporting health literacy. The case for prisons is compelling; the prison population is made up of some of the most marginalised, socially disadvantaged, socially excluded sections of society with multiple and complex needs (Senior and Shaw, 2007) including high rates of mental health issues (Fazel and Danesh, 2002), chronic health conditions (Herbert *et al.*, 2012), substance abuse (Brunton-Smith and Hopkins, 2013; Light *et al.*, 2013) and communicable diseases, such as Tuberculosis, Hepatitis C and HIV (Dolan *et al.*, 2016). The population group is large with a record number of people residing within prison establishments worldwide (Walmsley, 2018) with just under 83,000 prisoners detained across some 118 prisons in England and Wales (Her Majesty’s Prison and Probation

Service, 2019). Prisons offer an ideal opportunity to improve population health through returning prisoners back to their communities with better health than when they entered (World Health Organization, 2007).

Young adult men (aged 18-21 years) in prison are a particularly high need group within the prison population with additional increased vulnerabilities relating to histories of social exclusions, low educational attainment, violence, bereavement, abuse, neglect and time spent in local authority care (Bradley, 2009; Harris, 2015; House of Commons Justice Committee, 2016). These young people have been excluded from some of the valuable life experiences and learning opportunities such as formal education, positive peer learning, and navigating health systems which are important to support transition into healthy adulthoods. Clearly, there is a value in (re)-engaging with young adults who are detained in prison to support healthy lives and a generation-level reduction of negative health outcomes.

Translating public health intentions into action is challenging with the paradox that prisoners enter custodial settings with a range of complex health needs, yet prisons present a number of barriers to health improvement and exposes them to further risks to their health (Burgess-Allen *et al.*). Incidence of infectious diseases such as tuberculosis, Hepatitis C and HIV are much higher than in the general population (Dolan *et al.*, 2016), with increased risks of Covid-19 (Kinner *et al.*, 2020; Mehay *et al.*, 2020), with poor environmental cleanliness, personal hygiene, and close living conditions conducive to increased transition. Structurally, prisoners face barriers to accessing and engaging with prison-based and community-based health services (Herbert *et al.*, 2012) as well as limited exposure to a variety of healthy food, physical activity and fresh air, green and blue spaces (Jewkes *et al.*, 2019). Access, quality and provision of healthcare and health promotion varies across prisons both in England and Wales, and globally (MacDonald

et al., 2013; Woodall *et al.*, 2014). Psychologically, living in close proximity with others, places prisoners under considerable pressures relating to the loss of freedom and isolation from friends and family (de Viggiani, 2007) where violence and bullying are rife (Jewkes, 2005; de Viggiani, 2003) with high levels of self-harm and suicide (HM Chief Inspector of Prisons, 2018; Sirdifield *et al.*, 2020) at rates three times higher than the general population (Fazel *et al.*, 2011). The psychological ‘soft power’ of the modern prison also suggests that prisons present additional new pains, with the expectations to engage and manage indeterminacy, psychological assessments and self-government (Crewe, 2007, 2011; Crewe *et al.*, 2014). As such, young men report the challenges of living well in prison and needing to navigate and adopt a range of tactics to preserve their mental well-being (Mehay *et al.*, 2019).

Prisons are therefore regarded as unhealthy places (de Viggiani, 2007) which can be a ‘health depleting experience’ for many rather than supporting health improvement (Burgess-Allen *et al.*, 2006, p. 300). Health efforts in prison must therefore consider the social and structural reality of prison (de Viggiani, 2007; Woodall *et al.*, 2014) whilst recognising that people in prison are entitled to an equivalent standard of healthcare to that which they would receive in the community (Niveau, 2007). Although prisons are expected to undertake regular health needs assessments, there are no theoretically informed assessments which appropriately covers health needs across a range of health domains (i.e. health promotion, health service engagement and disease prevention). Health literacy, as an established determinant of health, provides a useful framework to assess needs and guide health improvement efforts in prison. This study aims to generate insights into health literacy across a young adult prison population. The study aims to:

1. determine the levels of health literacy across a young adult prison population

2. identify characteristics of young men with limitations in their health literacy
3. explore young men's experiences of the barriers to health literacy within the prison context

Methodology

Design

A mixed methods design was adopted through using quantitative and qualitative data and integrating findings (Kaur *et al.*, 2019). We utilised data from a quantitative survey to establish the levels of health literacy limitations and the association with key demographic and health characteristics. Qualitative data from semi-structured interviews were used to add insights by exploring barriers to health literacy in prison. We integrated the qualitative data with the quantitative data within a health literacy framework, and present the overall integrated findings.

Research setting

Of the 83,000 prisoners in England and Wales (Her Majesty's Prison and Probation Service, 2019), approximately ten percent of these are young adult men. The present study was conducted in a single English prison which detained approximately 390 sentenced young adult men aged 18-21 years old. At the time of the research, the most recent independent prison inspection rated the performance of the prison as either poor or not sufficiently good against pre-set healthy prison outcomes (safety, respect, purposeful activity, and rehabilitation and release planning).

Participants

Young men in this study were aged 18-21 years old and were residing in one of the general population wings or segregation unit. Those in the induction wing were excluded due to the lack of time and experience spent in the prison (usually only up to 2

weeks). Young men were also excluded from the research if they had a current active and unmanaged mental health disorder and if they had very limited understanding and ability to communicate in written or verbal English.

Ethical considerations

Prisoners are a vulnerable group and there are very specific ethical issues to be considered (King and Wincup, 2008), relating to the ability to give informed consent and risks associated with vocalising viewpoints about services and care within these highly coercive and controlled environments (Freudenberg, 2007; Klockars, 1974). As well as being granted the necessary University ethical approval and ethics approval from the National Offender Management Service (NOMS) (now Her Majesty's Prison and Probation Service), the researcher was required to inform the prison of any disclosure of offences which can be adjudicated against (i.e. disobeying lawful orders, failing a mandatory drug test or having an unauthorised item, such as a mobile phone) or any concerns relating to harms to self or others or absconding. Young men involved in the study were reassured about their anonymity and confidentiality, but were encouraged to discuss any concerns around these boundaries of confidentiality and the potential implications.

Part 1: Quantitative data

Measures

Quantitative data was collected using a series of existing measures which were adapted for this population where necessary. Measures were identified through individual discussions with 12 young men in the prison, where the researcher adapted a measure of health literacy with young men and selected potential measures relating to health behaviours and psychosocial health which young men deemed as most relevant and important to their health and wellbeing. The measures include the following:

1. *Demographic and prisoner characteristics:* Participants ethnicity, age, language, educational attainment and sentencing details (sentence length, time spent in the prison, and prisoner status on the Incentive and Earned Privileges Schemeⁱ (IEPS)).
2. *Health literacy:* an adapted version of the European Health Literacy Survey (HLS-EU-Q47) (a full explanation of the development follows in the next section).
3. *Physical health:* the Patient Health Questionnaire-15 (PHQ-15) is used to assess physical health where respondents are asked to rate if they had been bothered by 13 of the 15 items, such as sleep problems, pain, and nausea (two items removed as refer to sexual pain and menstrual pain, which are not relevant to our sample). The PHQ-15 is also used to assess the presence of somatization and somatoform disorders (Kroenke *et al.*, 2002) which refers to any mental disorder that manifests as physical symptoms.
4. *Smoking behaviours:* the Global Adult Tobacco Survey (GATS) (World Health Organisation, 2015) was included to measure tobacco use and intentions to quit. Prisons across England and Wales were moving to become ‘smoke-free’ but this had not been implemented in this prison at the time of the research fieldwork. Nor had electronic cigarettes or ‘vapes’ been introduced or popularised in the prison.
5. *Psychological health:* the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983) was administered as a measure of anxiety (HAD-A) and depression (HAD-D) and the Scale of Positive and Negative Experience (SPANE) (Diener *et al.*, 2009) to assess positive (SPANE-P), negative (SPANE-N) and overall affect (difference in negative affect and positive affect score,

where the overall affect score can vary from -24 (unhappiest possible) to 24 (highest affect balance possible)).

Adapting a measure of prison health literacy

Health literacy was measured using an adapted version of the *European Health Literacy Survey (HLS-EU-Q47)*. The original HLS-EU-Q47 survey was informed by a comprehensive, conceptual model of health literacy (Sørensen *et al.*, 2012). The model of health literacy includes four stages of information processing (accessing, understanding, appraisal, and applying) to generate knowledge and skills which enable a person to navigate the three domains of the health continuum: being ill or as a patient in the healthcare setting, as a person at risk of disease in the disease prevention system, and as a citizen in relation to the health promotion efforts (see Figure 1). Going through this process equips people to take control over their health and reflects the interactive or relational nature of health literacy by measuring the fit of personal competences with contextual or situational demands of social systems.

The HLS-EU-Q47 consists of 47 statements relating to various skills and opportunities and includes statements such as ‘understanding what the doctor or nurse says to you’, ‘understanding why you need vaccinations’, and ‘joining a sport or exercise club’ (see Figure 2 for description of information processes stages and sub-domains). For each item, respondents rated the perceived difficulty of a given task on a four-category Likert scale (i.e. very easy, easy, difficult and very difficult). Collectively, the items provide an overall score of health literacy, as well individual sub-scores for each of the three domains. Psychometric properties of the HLS-EU-Q47 has been established from administration across eight countries (Austria, Bulgaria, Germany, Greece, Ireland, the Netherlands, Poland and Spain, n = 8000 total sample). The study

confirmed appropriate cut-off points to establish limitations as well as confirmed association with a number of poor health outcomes.

Starting from this conceptual model of health literacy (Sørensen *et al.*, 2012), the HLS-EU-Q47 was examined and pre-tested for face validity with young men in prison using a think-aloud method. 12 young men volunteered to complete the HLS-EU-Q47 and were asked to describe their thoughts as they are completing items on the measures to monitor their comprehension and how they may construct meaning from the text. Where items were questioned, the researcher and young men discussed possible alternative wording and adaptations. An adapted version based on the process with young men was then presented to four prison healthcare staff members for an overall check of the relevance to prison health and healthcare. The HLS-EU-Q47 was subjected to overall minor amendments from the original to increase applicability to the prison context (i.e. reference to prison-based healthcare staff and services). The adapted HLS-EU-Q47 prison survey followed the same scoring method as outlined by the original authors. During this testing phase, we also explored young men's views on the study procedure, including how best to recruit young men for both quantitative and qualitative elements and the willingness of young men to speak with a female researcher. Young men confirmed the acceptability of a female researcher and were able to inform and guide appropriate study procedures to support recruitment. The 12 young men taking part in this initial testing were excluded from the main study.

Procedure

A sampling framework was used to ensure that young men of different ethnicities were invited to take part in the survey to gain a representative sample. The survey was completed with all consenting young men as an individual, paper-assisted, face-to-face structured interview with the researcher. Interviews were conducted in a

prison room on the prison wing and lasted approximately one hour.

Sample size

Using an online sample size calculator, a sample size of 105 young men was required to ensure enough statistical power to identify distributions of limitations and any associations with health outcomes based on findings from the large European survey of health literacy (Sørensen *et al.*, 2015).

Part 2: Qualitative data

Measures

A topic guide was developed to guide semi-structured interviews. Questions included: *How does being here affect your general health and wellbeing? How do you keep yourself healthy here? Can you tell me about your experience of health care here? Who normally supports you in your health? What difficulties do you experience?* The interviews were not audio recorded due to security constraints within the prison, where electronic recording devices were prohibited. Written notes were taken by the researcher during the interviews instead and later coded and analysed.

Procedure

Participants were recruited for semi-structured interviews by the researcher through face-to-face contact with young men on the wings using a ‘wherever/whenever’ approach. An information sheet was used to introduce the study which the young men had the option of taking away to read later or reading right there with the researcher or other representative. Interviews were conducted in a prison room on the prison wing and lasted approximately one hour.

Analyses

All quantitative data analyses were conducted in SPSS (version 21). Analyses focused on the three domains of the health literacy continuum (being ill or as a patient

in the healthcare setting, as a person at risk of disease in the disease prevention system, and as a citizen in relation to the health promotion efforts). Scores for overall health literacy and for each of the three subdomains are totalled and transformed to a unified metric with a minimum of 0 and a maximum of 50, where 0 represents the least possible and 50 the best possible health literacy score. Thresholds for identifying limited health literacy were set in line with the original authors of the HLS-EU-Q47, and include 'inadequate' (0–25), 'problematic' (>25–33), 'sufficient' (>33–42) and 'excellent' (>42–50) health literacy. To detect vulnerable groups, the 'inadequate' and 'problematic' levels were combined to a single level, called 'limited health literacy' (0–33). Mean (with standard deviations) and percentage distributions are calculated for levels of health literacy. Initial exploratory univariate analysis was conducted to identify demographic and health-related characteristics associated with health literacy. Those characteristics where there were significantly higher proportions of limited than adequate health literacy were entered into a multivariable linear regression model where logistic regression was used with the total sample to model predictors of limited health literacy. The results are presented as odds ratios (OR) with 95% confidence intervals (CI) and p-value. In all analyses, a p-value of < 0.05 was considered statistically significant (indicated with * at $p < 0.05$ and ** at $p < 0.01$), and all analyses were two-sided. Effect sizes for statistically significant findings are reported as CI (continuous) and Phi coefficient (categorical).

Written notes from qualitative semi-structured interviews were transcribed and analysed in NVivo (version 10). A thematic analysis was conducted to explore the barriers to health literacy (Ritchie *et al.*, 2003). This involved the first author gaining in-depth familiarity with the transcripts followed by a process of coding and indexing in line with health literacy subdomains. Coding and themes were discussed with the co-

authors, a pragmatic version of double coding. Interview transcripts were then revisited where codes were double-checked with the interview data. Relevant quotations were then selected based on their frequency, richness, and ability to reflect the main points within each theme. Pseudonyms are applied to protect the identity of participants.

A visual joint display is developed with data and insights integrated and further developed within an overall health literacy framework.

Findings

Quantitative findings

Sample

Overall, 110 young men were approached to take part in the survey, of which six declined, leaving a final sample size of 104. The participants' were representative of the wider prison population in relation to demographic and prison characteristics. Two-thirds (n=67, 64%) of the survey participants' self-identified as belonging to a Black, Asian or other Minority Ethnic group with a mean age of 19 years. English was a first language for 90% of the participants' (n=94). Most (n=69, 66%) reported achieving a school level qualification or higher (e.g. GCSE, A Level). Participants were serving a mean sentence of three years and five months, with sentence lengths ranging from six months up to 12 years. Participants had spent a mean time of 6 months at the prison (ranging from one week up to two years). Most participants in the survey sample (n=62, 60%) were 'standard' level, with 31% (n=29) 'enhanced' level, and 8% basic (n=8) on the prisons IEPS¹.

Participants reported a range of health characteristics; half (n=55, 53%) reported experiencing more than one somatic symptom with trouble sleeping (n=57, 55%), back pain (n=53, 51%) and feeling tired or having little energy (n=51, 49%) the most

bothersome. As measured by the HAD-A and HAD-D, 39% (n=41) and 32% (n=33) scored within a mild, moderate or severe state for anxiety or depression ('caseness'), respectively. Participants also scored a mean of 20 (of 24) on the positive SPANE sub-scale, 15 on the negative SPANE sub-scale with a mean overall affect of -5 (with scores ranging from -24 to 24). Most participants (n=70, 67%) reported that they were current smokers.

Levels of health literacy in the young adult prison population

Mean scores on the adapted HLS-EU-Q47 prison survey are outlined in Table 1. As outlined in Figure 3, 72% (n=75) of young men scored within a range indicating limitations in health literacy (30% as 'inadequate' and 42% 'problematic') and 28% (n=29) as adequate health literacy (23% as 'sufficient' and 5% as 'excellent'). High levels of limitations were reported across all three domains of health literacy, with the greatest limitations reported in relation to health promotion (n=80, 77%), followed by disease prevention (n=76, 73%) and healthcare contexts (n=61, 59%).

Characteristics of young men with limitations in health literacy

Overall health literacy

No demographic characteristic predicted if young men scored within limitations in health literacy. Young men with limitations in health literacy however tended to be on a lower IEPS status and report higher scores of depression and negative affect, lower positive affect scores and more problems with sleep, nausea and tiredness with an indication of a somatisation disorder ($\chi^2 (12, n=101) = 29.76, p = 0.00$). As shown in Table 2, increased anxiety (HAD-A) and lower feelings of positive affect (SPANE-P) made a uniquely statistically significant contribution predicting limitations, with anxiety, recording an OR of 1.26 [CI 1.01 – 1.58]. This indicates that for each increase

of 4.1 on the HAD-A, respondents were also 1.26 times more likely to report limitations in health literacy. Positive Affect scores (SPAN-E-P) also made a unique predictor of limitations, recording an OR of 0.79 [CI 0.63 – 0.99]. The OR of 0.79 for SPAN-E-P is less than 1, indicating that for each increase of 4.7 on SPAN-E-P scores, respondents were 1.26 times less likely to report limitations in health literacy.

Being ill in a healthcare context

No demographic characteristics predicted if young men scored within limitations in health literacy. Young men with limitations in health literacy as related to being ill in a healthcare context, tended to have spent more time in the prison with increased scores in anxiety and depression and more problems relating to headaches and nausea ($\chi^2 (7) = 31.28, p = 0.00$). As shown in Table 3, time in the prison was the strongest predictor of limitations where young men serving between 6 months – 1 year were over 12 times more likely to report limitations in health literacy (OR: 12.62 [CI 2.33 – 68.41]).

Risk of disease and prevention

No demographic characteristic predicted if young men scored within limitations in health literacy. Young men with limitations in health literacy as related to risk of disease and prevention, tended to have increased anxiety and depression with more problems relating to sleep ($\chi^2 (4) = 12.24, p = 0.02$). As shown in Table 4, none were individually predictive of these limitations.

Health promotion efforts

No demographic characteristic predicted if young men scored within limitations in health literacy. Young men with limitations in health literacy as related to health promotion efforts, tended to be on a lower IEPS status and also scores with increased negative affect, depression and anxiety with lower positive affect ($\chi^2 (7) = 20.54, p =$

0.01). As shown in Table 5, lower positive affect was the strongest predictor of limitations where young men were 1.26 times less likely to report limitations with increased positive affect (OR: 0.79 [CI 0.64 – 0.99]).

Qualitative findings

Six themes were elicited from qualitative data as related to the barriers to health literacy. These included: *captive anxiety*, *system-centred healthcare*, *cleanliness and hygiene*, *violence*, *authoritative paternalism*, and *disrupted connections*. The themes are described further:

Captive anxiety

Young men reflected on ‘*captive anxiety*’, where their health concerns and anxieties were exacerbated by long periods of time on ‘bang-up’ (time locked in their cell). Most young men described a bleak picture of life in the prison which was largely uneventful and unproductive. Many reported spending up to 23 hours a day ‘bang-up’, with weekends particularly challenging with little to no activities on offer. Most young men spoke of this time as challenging with many health anxieties. Harry (participant 4), for example, reflected:

“...I had a lump under my arm and I was scared because at night you have nothing to think about. I asked the nurse and he gave me paracetamol. I can’t ask my mum because she is not here but I thought it was cancer” (participant 4)

For young men like Harry, they describe how ‘bang-up’ led to high levels of health anxieties, with little support available from family or healthcare. Others reflected similar experiences and noted that parental figures were often a source of support, but in prison they had to manage these anxieties alone.

System-centred healthcare

Young men reflected on their experience engaging with prison healthcare, which was viewed as *system-centred healthcare*. In this regard, young men described the process of engaging with health information, requesting an appointment and the interactions with healthcare staff as more focused on the systems needs rather than their own needs. Young men described the lack of health information on ways to prevent and self-manage their own health and particularly relayed their frustrations as posters being placed in areas which were inaccessible to them (i.e. corridor areas which were out of reach to them). The health leaflets on offer were described as lacking relevance to their context in prison and the lived experience of the challenges they faced in managing their own health needs.

If requiring support for their health, young men were expected to request an appointment with prison healthcare through a paper-based ‘app’ system which involved completing a short form and posting in a box on the wing (which was picked up by healthcare staff once a day). All young men described their frustrations with the app system viewing it as untrustworthy and unresponsive to their needs. Young men responded that the apps would often go unanswered either through going missing or being deliberately ignored by staff, so often felt they had to submit several apps to be sure at least one would get to healthcare. The process of seeing a nurse first who would assess and triage their needs was seen as unresponsive to their needs since this was seen as too slow, particularly during episodes of ill health. For example, Emmanuel (participant 9) reflected his frustration in that:

“...you put in a sick app and they see you 24 hours later but if you are in excruciating pain then you have to still wait” (participant 9)

These frustrations were further compounded when seeing health professionals entering the wings where they reside to collect apps and conduct other structured appointments when they might be feeling particularly unwell and wanting support. Young men had a preference for more regular ‘drop-in’ sessions which would be more accessible and responsive to their needs.

Furthermore, contact with healthcare staff was also described as more system-centred, with little shared decision making or personalised care where young men could discuss their own concerns fully and utilise the opportunity to understand the causes and possible preventative action of ill health. Fred (participant 12) for example, described a recent encounter with a primary care health professional who dealt with his health issue efficiently but Fred was left not fully understanding his health condition:

“...it’s like he’s done the working out but doesn’t show you how he did it – just the end result” (participant 12)

Many felt that more consultation and collaboration would provide them with a sense of control over their health as well as the tools to prevent future problems. Furthermore, some young men expressed the system-centred focus of healthcare meant their own needs were often neglected. Harinder (participant 31) for example, reflects on the experience of being viciously attacked in prison by a group of other prisoners. The attack left him with visible scars on his face which caused him great distress as it was a visible reminder of the attack and this also affected his confidence. He explains his encounter with healthcare where;

“...I went to healthcare as I wanted some cream and oils for my scars. They just came and were worried about my asthma. But the scar thing really bothered me. I hate myself when I look in the mirror” (participant 31)

For Harinder and others, healthcare were seen to be more focused on priorities set by them rather than meeting his own needs. It was a missed opportunity to provide him with reassurance and support. This perceived lack of support and reassurance from healthcare was echoed throughout many of the interviews with young men.

Cleanliness and hygiene

Young men reflected that keeping a high standard of *cleanliness and hygiene* in prison was severely limited by the lack of resources, opportunities, and knowledge. Cleaning regimes were not seen as regular enough and young men described occasions where facilities have failed with too little action (i.e. overflowing toilets). Young men queried the appropriateness of prisoners cleaning the physical space with little knowledge (and motivation) to maintain high standards of hygiene. As such, young men felt there were high risks of diseases and infections which were hard to mitigate since much of the measures were out of their control.

Young men also reflected on similar challenges in maintaining their *personal hygiene*. The young men described a lack of opportunities within the prison regime to keep themselves clean and hygienic where, for instance, Ricardo (participant 23) reflects that:

“...personal hygiene is really important to me and it’s really bad in here for that...cell cleaning here happens once every 2 weeks – 2 weeks! Can you imagine how dirty this place gets in 2 weeks! I don’t get it as I think I should get a shower everyday
too” (participant 23)

Many young men echoed Ricardo’s frustrations where they were not provided with enough opportunities or ability to control the cleanliness of themselves and their physical surroundings.

Violence

All the young men spoke at length about the prison social environment and the daily risk of actual *violence* to themselves. Young men spoke of the high levels of violence in the prison and the conflicts they were faced with, which directly affected both their physical health as well as the toll on their mental health in staying alert, navigating risks, and dealing with the emotional aftermath of altercations. For example, Javon (participant 17) described his involvement in a gang where he says:

“...you just don't want to be weak in here. I got a lot of issues like gang dramas. So I get strong really for my own safety. I don't look for drama but I am ready for it if it comes to me... it's called 'staying on point'. You can never be relaxed or let your guard down. You're always anxious” (participant 17)

Javon here speaks of the constant vigilance to 'stay on point' and managing these risks and navigating the precariousness of the social environment – which did not allow consideration of wider health promotion efforts whilst in prison.

Authoritative paternalism

The social context was largely viewed as violent but young men reflected on the challenges of an *authoritative paternalism* approach adopted by the prison. Here, their behaviours were subject to greater controls and restrictions compared with adult prisons, due to the challenges of violence and the perceived risks presented by nature of their age. Young men were acutely aware that they were often seen and labelled as risky with increased levels of volatility meaning that the prison regime was set up to reduce these risks by restricting their behaviours. Many of the young men had spent part of their sentence in an adult prison and were able to compare the different approaches from adult prisons to what they often described as 'kiddy' prisons. Although the young men

acknowledge the challenges of the prison environment in managing risks of violence, they all felt infantilised by the prison restrictions imposed on them, which did not provide the information, guidance or opportunity to make adult choices for their own health. Ali (participant 26) for example reflects on his previous experience in prison and being released where he explains;

“being in prison takes away your independence and you don’t do anything for yourself...from being very independent and then coming here and your independence being taken away – and then going out again – it’s hard!” (participant 26)

Some of the frustrations of these restrictions focused on food choices provided in meals as well as additional food items to purchase, which were deemed too restrictive compared with adult prisons. Ricardo (participant 23) expressed his frustration and explained;

“...in adult jails, you’re given more responsibilities and you’re given more opportunities...On my wing it was really good. We even had a kitchen area where we could use a microwave and stuff and make our own food. We used to cook together and hang out there. It was proper homely. We all ended up looking out for each other there and the adults looked after the younger ones and kept some of us in check too. And they didn’t tolerate bullying at all. It was like a community and we helped each other and it was a good place to be” (participant 23)

Here Ricardo contrasts this to his life at the current ‘kiddy’ prison to the adult prison he was in previously, and reflects on the different approach in both taking control over food choices as well as the opportunity to create homely environments and develop supportive networks. For many, the rationale for placing restrictions on food choices were viewed as unreasonable, since they rarely had the effect of reducing risks of harm. Martin (participant 24), for example, highlights;

“...you can’t have tins in case you use it to cut someone or put it in a sock to hit someone but you could use your belt or a snooker ball! It doesn’t make sense. Other jails you get rice, peas, seasoning but here you can’t do none of that. The healthiest thing in the prison ends up being water!” (participant 24)

Young men also spoke of the additional restrictions over their movements compared with adult prisons, which meant they spent long periods of time locked in their cell. This in turn led to increased unhealthy behaviours such as smoking and drug use. Jason (participant 15) notes that:

“I smoke way more in here because of boredom, being homesick, and loads of different reasons. Smoking is my only coping mechanism” (participant 15)

Some young men engaged in illegal drug use to manage boredom and ‘bang-up’ time since these offered a chance of ‘escapism’. They were keen for a shift from authoritative paternalistic approaches to one which kept them safe but supported them to make better and healthier choices for themselves.

Disrupted connections

Young men reflected on broad issues associated with their experience of imprisonment, including *disrupted connections* with the social world and nature. Young men spoke of the extreme challenges in being disconnected with family and the challenges in navigating the prison system without a significant other guiding them or providing space to ‘be themselves’. Javon, for example states:

“...here, you are so concerned with just dealing with prison, even though you know you should be positive, you sometimes think I might as well be the person they think I am. But I speak to my mum and try and get myself back on track. It’s just she doesn’t see me the way others see me. She doesn’t see me as a crook, she sees me as her bambino. She helps to keep me positive and encourages me to change it up...but it gets hard and

you sometimes can't be bothered and you think fuck it so what! It feels the easier option is to be what they want you to be" (participant 17)

Young men also reflected on the challenges of being away from nature, and described the prison environment as stifling and oppressive, particularly referring to the air as thick and heavy and the environment noisy with constant echoes of talking, shouting, and music. Many young men described this overall environment as effecting their general health and wellbeing, and their inability to influence or change this. Young men reflected that this was prison and that these conditions were expected, but that they did have detrimental effects on their health.

Integration and framework for prison health literacy

The overall findings from quantitative and qualitative data are integrated in an overall framework of prison health literacy (see Figure 4). Three over-arching themes relating to barriers to health literacy were elicited through grouping the qualitative themes and related survey data (i.e. IEPS status). The over-arching themes of the barriers included: *structural restrictions*, *limited access to formal support*, and *social and natural disruptions*. These barriers were linked to the high levels of limitations reported from the survey across the young adult prison population sample (72% overall, 61-77% across the three domains of health literacy). As identified from the survey findings, those reporting limitations in their health literacy tended to report increased levels of headaches, nausea, sleep, tiredness, reduced mental wellbeing, and increased somatisation problems.

Discussion

Main findings of the study

Health literacy describes the skills of individuals as well as the skills of professionals and policy related constraints/facilitators set by the institutions (Nutbeam, 1998; Rudd, 2015). The present study aimed to generate insights into health literacy across a young adult prison population, specifically examining the level of limitations, barriers and characteristics associated with these limitations. The integrated data forms an overall framework of prison health literacy (see Figure 4) and demonstrates the high levels of limitations in health literacy across this representative prison sample, with 72% (n=75) of young men scoring as limited in their health literacy. Barriers to health literacy included structural restrictions, limitations to access to formal support, and social and natural disruptions. No demographic characteristics or smoking intentions/behaviours predicted if young men scored within limitations in health literacy but a lower IEPS status and longer time in the prison were predictive of limitations. In addition, physical problems (sleep, nausea, tiredness and headaches), mental health and wellbeing (anxiety, depression and affect), and somatisation problems were predictive of limitations in health literacy.

This study extends the evidence base on health literacy by examining health literacy in a marginalised, socially disadvantaged, socially excluded section of society with multiple and complex needs (Senior and Shaw, 2007). This study found that 72% of young adult men reported limited health literacy whilst in prison (in contrast to estimates of nearly half in a large European community sample) and these limitations are associated with common health characteristics such as physical problems and poor mental health and wellbeing. The lack of association between health literacy and

smoking behaviours are likely to interact with mental wellbeing, which may have a greater impact on behaviours than health literacy alone.

Consistent with findings from other studies, this study confirms the structural and social barriers to achieving some of the public health ambitions for prison health (de Viggiani, 2007; Woodall *et al.*, 2014). This study highlights the additional level of restrictions (and frustrations) for young men in what they refer to as ‘kiddy prisons’. Long periods of ‘bang-up’, high levels of restrictions, limited access to support, and the disruptions with social connections and nature meant there were few opportunities to learn and develop greater mastery over their health whilst in prison. Many of the young men reflected on contradictory nature of these conditions; that they were often in place for their own safety as young adult yet instead they were damaging to their health. Alongside the harsh restrictions, they were also expected to engage and take charge of aspects of their lives in prison (i.e. reaching out to healthcare, engaging in health promotion activities), yet experienced barriers in doing so – an indication of the exercising of ‘soft power’, which presents additional struggles and pains (Crewe, 2007, 2011; Crewe *et al.*, 2014). This would likely stall any transition to healthy and health literate adulthood.

Limitations

The study is limited to a single English prison and since health literacy is context-specific, future research should examine if the findings are replicated in other prison contexts. The study used a cross-sectional design, therefore the findings can only reflect associations rather than causation of health literacy with key characteristics. Furthermore, as an exploratory study, we were unable to collate and account for the full range of confounders which may support interpretation of findings. Future research should explore the psychometric properties of the prison health literacy questionnaire

and examine broader health and prison characteristics to gain a fuller profile of limitations of health literacy.

Practical implications

The findings point to a number of implications for practice and policy which prisons can action to create more health literate environments. Prison healthcare services and commissioners should undertake regular health literacy needs assessments to support development of health literate environments which reduce barriers to healthcare. Key features should include: informal drop-in sessions, use of technology for appointment requests, developing peer-based approaches, staff training in collaborative care in triage and consultation, offering greater choices and guidance around food, improved access to quality purposeful activities and reducing time in 'bang-up'. Prisons should consider creating 'health literate' wings to allow greater guidance and development of health literacy within their population groups. Clearly some of these actions require greater political will and investment to consider the broader action requires on the wider determinants of (prison) health to ensure an environment which is both safe, healthy and enables health literacy.

Originality/value

This is the first study known to the authors which examines health literacy in a prison population. The initial engagement and testing of the study procedures and measures with young men in the prison meant there was a high level of engagement and recruitment in the study to allow a thorough exploration of health literacy. The findings highlight that health literacy is a dynamic construct which concerns the interaction of individual, social and structural factors. Efforts to strengthen health literacy should not be framed as the sole responsibility of individuals, but equal attention must be given to

ensure that governments, prison leaders and their health systems present clear, accurate, appropriate and accessible information and support for young men when in prison.

These objectives have become pertinent in light of the current COVID-19 global pandemic, where prisons have been a cause of concern for public health as key vectors in the transmission and spread of infectious diseases (Kinner *et al.*, 2020; Mehay *et al.*, 2020). The case for prison health should not only be heightened during crisis points, like that during the COVID-19 epidemic, but requires long-term investment and consideration. Health literacy deficit and inequality in the young adult prison population needs to be addressed by prison and health planners and policymakers if the ambitions in public health strategies to address larger health disparities are to be fully realised.

References

- Batterham, R.W., Hawkins, M., Collins, P.A., Buchbinder, R. and Osborne, R.H. (2016), “Health literacy: applying current concepts to improve health services and reduce health inequalities”, *Public Health*, Vol. 132, pp. 3–12.
- Bradley, K. (2009), *The Bradley Report. Lord Bradley’s Review of People with Mental Health Problems or Learning Disabilities in the Criminal Justice System*, Department of Health, London, available at: <http://www.rcpsych.ac.uk/pdf/Bradley%20Report11.pdf> (accessed 20 November 2013).
- Brunton-Smith, I. and Hopkins, K. (2013), *The Factors Associated with Proven Re-offending Following Release from Prison: Findings from Waves 1 to 3 of SPCR*, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/261620/re-offending-release-waves-1-3-spcr-findings.pdf (accessed 28 April 2014).
- Burgess-Allen, J., Langlois, M. and Whittaker, P. (2006), “The health needs of ex-prisoners, implications for successful resettlement: A qualitative study”, *International Journal of Prisoner Health*, Vol. 2 No. 4, pp. 291–301.
- Crewe, B. (2007), “Power, adaptation and resistance in a late-modern men’s prison”, *British Journal of Criminology*, Vol. 47 No. 2, pp. 256–275.
- Crewe, B. (2011), “Depth, weight, tightness: Revisiting the pains of imprisonment”, *Punishment & Society*, Vol. 13 No. 5, pp. 509–529.
- Crewe, B., Liebling, A. and Hulley, S. (2014), “Heavy–light, absent–present: rethinking the ‘weight’ of imprisonment”, *The British Journal of Sociology*, Vol. 65 No. 3, pp. 387–410.

- Diener, E., Wirtz, D., Tov, W., Kim-Prieto, C., Choi, D., Oishi, S. and Biswas-Diener, R. (2009), “New Well-being Measures: Short Scales to Assess Flourishing and Positive and Negative Feelings”, *Social Indicators Research*, Vol. 97 No. 2, pp. 143–156.
- Dolan, K., Wirtz, A.L., Moazen, B., Ndeffo-mbah, M., Galvani, A., Kinner, S.A., Courtney, R., McKee, M., Amon, J.J., Maher, L., Hellard, M., Beyrer, C. and Altice, F.L. (2016), “Global burden of HIV, viral hepatitis, and tuberculosis in prisoners and detainees”, *The Lancet*, Vol. 388 No. 10049, pp. 1089-1102.
- Fazel, S. and Danesh, J. (2002), “Serious mental disorder in 23 000 prisoners: a systematic review of 62 surveys”, *The Lancet*, Vol. 359 No. 9306, pp. 545–550.
- Freudenberg, N. (2007), “Health research behind bars: a brief guide to research in jails and prisons”, in Greifinger, R.B. (Ed.), *Public Health behind Bars*, Springer, New York, pp. 415-433, doi: 10.1007/978-0-387-71695-4_24.
- Harris. (2015), *The Harris Review - Changing Prisons, Saving Lives Report of the Independent Review into Self-Inflicted Deaths in Custody of 18-24 Year Olds*, available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/439859/moj-harris-review-web-accessible.pdf (accessed 13 August 2015).
- Fazel, S., Grann, M., Kling, B., & Hawton, K. (2011). Prison suicide in 12 countries: an ecological study of 861 suicides during 2003–2007. *Social psychiatry and psychiatric epidemiology*, 46(3), 191-195.
- Her Majesty’s Prison and Probation Service. (2019), *Prison Population Bulletin: Monthly February 2019*, available at:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/784700/monthly-pop-bull-feb-2019.ods.

- Herbert, K., Plugge, E., Foster, C. and Doll, H. (2012), “Prevalence of risk factors for non-communicable diseases in prison populations worldwide: a systematic review”, *Lancet*, Vol. 379 No. 9830, pp. 1975–1982.
- HM Chief Inspector of Prisons. (2018), *HM Chief Inspector of Prisons for England and Wales Annual Report 2017–18*, HM Inspectorate of Prisons, available at: https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/724657/HMI-Prisons_Annual_Report_2017-18_Print.pdf.
- House of Commons Justice Committee. (2016), *The Treatment of Young Adults in the Criminal Justice System*, No. Seventh Report of Session 2016–17, House of Commons, available at: http://www.publications.parliament.uk/pa/cm201617/cmselect/cmjust/169/169.pdf?utm_source=169&utm_campaign=modulereports&utm_medium=module.
- Jewkes, Y. (2005), “Men Behind Bars ‘Doing’ Masculinity as an Adaptation to Imprisonment”, *Men and Masculinities*, Vol. 8 No. 1, pp. 44–63.
- Jewkes, Y., Moran, D. and Turner, J. (2019), “Just add water: prisons, therapeutic landscapes and healthy blue space”, *Criminology and Criminal Justice*, Vol. 20 No. 4, pp. 381-398, doi: 10.1177/1748895819828800.
- Kaur, N., Vedel, I., El Sherif, R. and Pluye, P. (2019), “Practical mixed methods strategies used to integrate qualitative and quantitative methods in community-based primary health care research”, *Family Practice*, Oxford Academic, Vol. 36 No. 5, pp. 666–671.
- Kickbusch, I., Pelikan, J.M., Apfel, F. and Tsouros, A.D. (2013), *Health Literacy: The Solid Facts*, World Health Organization (WHO), Copenhagen
- King, R. and Wincup, E. (2008), *Doing Research on Crime and Justice*, Oxford University Press, Oxford.

- Kinner, S.A., Young, J.T., Snow, K., Southalan, L., Lopez-Acuña, D., Ferreira-Borges, C. and O'Moore, É. (2020), "Prisons and custodial settings are part of a comprehensive response to COVID-19", *The Lancet Public Health*, Elsevier, Vol. 5 No. 4, pp. e188–e189.
- Klockars, C.B. (1974), "Professional Researchers And Prisoner Subjects: Some Ethical Problems And Practical Solutions", *The Prison Journal*, Vol. 54 No. 2, pp. 34–42.
- Kroenke, K., Spitzer, R.L. and Williams, J.B.W. (2002), "The PHQ-15: validity of a new measure for evaluating the severity of somatic symptoms", *Psychosomatic Medicine*, Vol. 64 No. 2, pp. 258–266.
- Light, M., Grant, E. and Hopkins, K. (2013), *Gender Differences in Substance Misuse and Mental Health amongst Prisoners*, available at:
https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/20060/gender-substance-misuse-mental-health-prisoners.pdf (accessed 28 April 2014).
- MacDonald, M., Rabiee, F. and Weilandt, C. (2013), "Health promotion and young prisoners: a European perspective", *International Journal of Prisoner Health*, Vol. 9 No. 3, pp. 151–164.
- Mehay, A., Meek, R. and Ogden, J. (2019), "I try and make my cell a positive place': tactics for mitigating risks to health and wellbeing in a young offender institution", *Health and Place*, Vol. 57, pp. 54-60.
- Mehay, A., Meek, R. and Ogden, J. (2020), "Coronavirus: why prison conditions can be a perfect storm for spreading disease", *The Conversation*, available at:
<https://theconversation.com/coronaviruswhy-prison-conditions-can-be-a-perfect-storm-for-spreading-disease-134106>.

- Niveau, G. (2007), “Relevance and limits of the principle of ‘equivalence of care’ in prison medicine”, *Journal of Medical Ethics*, Vol. 33 No. 10, pp. 610–613.
- Nutbeam, D. (1998), “Health promotion glossary”, *Health Promotion International*, No. 13, pp. 349–364.
- Ritchie, J., Lewis, J., Nicholls, C.M. and Ormston, R. (Eds) (2013), “*Qualitative Research Practice: A Guide for Social Science Students and Researchers*, Sage.
- Rudd, R.E. (2015), “The evolving concept of Health literacy: New directions for health literacy studies”, *Journal of Communication in Healthcare*, Vol. 8 No. 1, pp. 7–9.
- Senior, J. and Shaw, J. (2007), “Prison Healthcare”, *Handbook on Prisons*, Routledge.
- Sirdifield, C., Brooker, C. and Marples, R. (2020), “Suicide and Probation: a systematic review of the literature”, *Forensic Science International: Mind and Law*, Vol. 1, p. 100012.
- Sørensen, K., Van den Broucke, S., Fullam, J., Doyle, G., Pelikan, J., Slonska, Z., Brand, H.; (HLS-EU) Consortium Health Literacy Project European (2012), “Health literacy and public health: a systematic review and integration of definitions and models”, *BMC Public Health*, Vol. 12 No. 1, p. 80.
- Sørensen, K., Pelikan, J.M., Røothlin, F., Ganahl, K., Slonska, Z., Doyle, G., Fullam, J., Kondilis, B., Agrafiotis, D., Ueters, E. and Falcon, M. (2015), “Health literacy in Europe: comparative results of the European health literacy survey (HLS-EU)”, *European Journal of Public Health*, Vol. 25 No. 6, pp. 1053-1058.
- de Viggiani, N. (2003), *(Un)Healthy Prison Masculinities: Theorising Men’s Health in Prison*, available at: <http://eprints.uwe.ac.uk/16941/1/thesis%20b.PDF> (accessed 11 November 2014).

- de Viggiani, N. (2007), Unhealthy prisons: exploring structural determinants of prison health, *Sociology of Health & Illness*, Vol. 29 No. 1, pp. 115–135.
- Walmsley, R. (2018), *World Prison Population List*, 12th ed., International Centre for Prison Studies, London, available at:
http://www.prisonstudies.org/sites/default/files/resources/downloads/wpp1_12.pdf.
- Woodall, J., de Viggiani, N., Dixey, R. and South, J. (2014), “Moving prison health promotion along: towards an integrative framework for action to develop health promotion and tackle the social determinants of health”, *Criminal Justice Studies*, Vol. 27 No. 1, pp. 114–132.
- World Health Organisation. (2015), *WHO Report on the Global Tobacco Epidemic, 2015*, WHO, Geneva.
- World Health Organization (2007), *Health in Prisons: A WHO Guide to the Essentials in Prison Health*, WHO Regional Office for Europe, Copenhagen.
- Zigmond, A.S. and Snaith, R.P. (1983), The hospital anxiety and depression scale, *Acta Psychiatrica Scandinavica*, Vol. 67 No. 6, pp. 361–370.

Figures and Tables

FIGURE 1: CONCEPTUAL MODEL OF HEALTH LITERACY (FROM SØRENSEN ET AL., 2012, PG. 9)

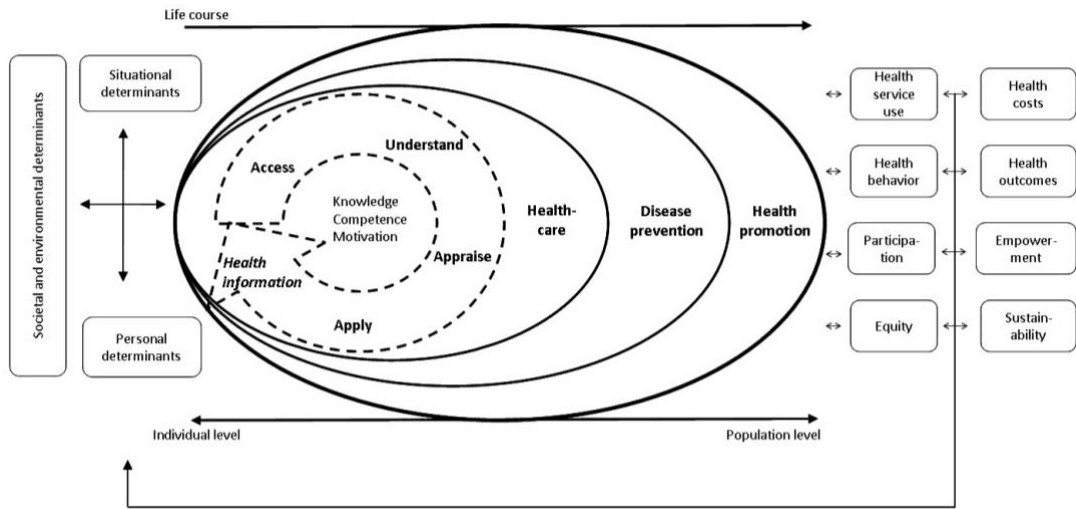


FIGURE 2: BRIEF DESCRIPTION OF HEALTH LITERACY SUBDOMAINS (FROM SØRENSEN ET AL., 2012, PG. 10)

	Access	Understand	Appraise	Apply
Health care	Ability to access information on medical or clinical issues	Ability to understand medical information and derive meaning	Ability to interpret and evaluate medical information	Ability to make informed decisions on medical issues
Disease prevention	Ability to access information on risk factors for health	Ability to understand information on risk factors and derive meaning	Ability to interpret and evaluate information on risk factors for health	Ability to make informed decisions on risk factors for health
Health promotion	Ability to update oneself on determinants of health in the social and physical environment	Ability to understand information on determinants of health in the social and physical environment and derive meaning	Ability to interpret and evaluate information on health determinants in the social and physical environment	Ability to make informed decisions on health determinants in the social and physical environment

FIGURE 3: PREVALENCE OF LIMITED HEALTH LITERACY BY DOMAINS

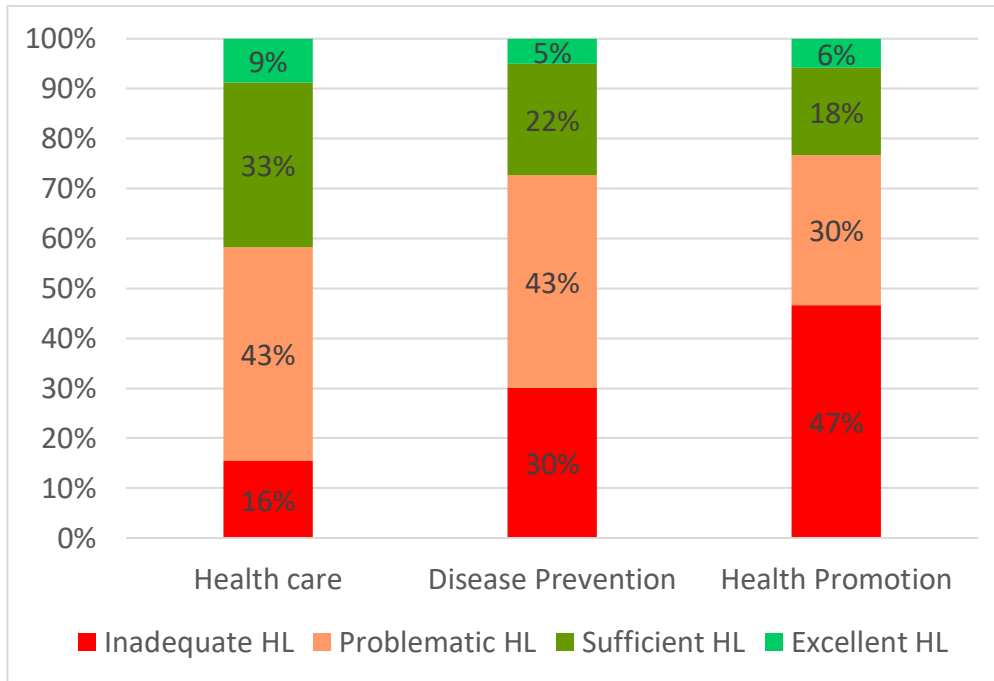


FIGURE 4: FINAL FRAMEWORK OF PRISON HEALTH LITERACY

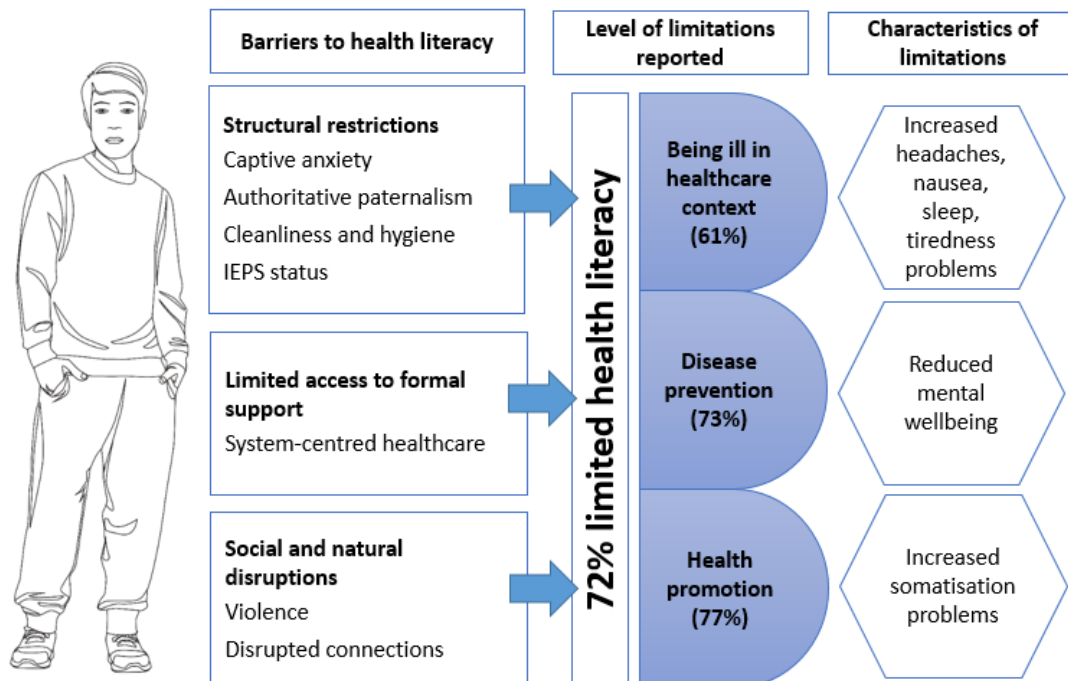


TABLE 1: MEAN SCORES ON ADAPTED HLS-EU-Q47 PRISON SURVEY

	N	Min	Max	Mean	SD
OVERALL (raw scores)	104	77	187	129.83	20.73
OVERALL (metric scores)	104	10.64	49.65	29.37	7.35
HEALTH DIMENSIONS					
Health care	104	12.5	50	32.42	6.92
Disease prevention	104	5.56	50	28.78	8.72
Health promotion	104	4.17	50	26.87	9.28

TABLE 2: LOGISTIC REGRESSION MODEL: OVERALL HEALTH LITERACY

	B	S.E.	Wald	Df	Sig.	OR	95% CI for OR	
							Lower	Upper
IEPS (basic)			2.38	2.00	0.30			
IEPS (standard)	-0.16	1.28	0.02	1.00	0.90	0.85	0.07	10.42
IEPS (enhanced)	-1.04	1.32	0.62	1.00	0.43	0.35	0.03	4.73
Sleep problems	0.28	0.63	0.20	1.00	0.65	1.32	0.39	4.52
Nausea	1.05	1.03	1.03	1.00	0.31	2.85	0.38	21.39
Feeling tired	-0.11	0.66	0.03	1.00	0.86	0.89	0.25	3.24
Somatisation disorder (none)			3.61	3.00	0.31			
Somatisation disorder (mild)	1.06	0.75	2.03	1.00	0.15	2.89	0.67	12.48
Somatisation disorder (moderate)	1.58	1.38	1.32	1.00	0.25	4.86	0.33	72.22
Somatisation disorder (severe)	-0.32	1.37	0.06	1.00	0.81	0.72	0.05	10.62
HAD-A score	0.23	0.12	4.09	1.00	0.04*	1.26	1.01	1.58
HAD-D score	-0.09	0.14	0.37	1.00	0.54	0.92	0.70	1.21
SPANE-P score	-0.23	0.12	4.00	1.00	0.05*	0.79	0.63	1.00
SPANE-N score	-0.23	0.13	3.10	1.00	0.08	0.79	0.61	1.03
Constant	7.96	3.98	4.01	1.00	0.05	2865.05		

TABLE 3: LOGISTIC REGRESSION MODEL: HEALTH LITERACY WITHIN A HEALTHCARE CONTEXT

	B	S.E.	Wald	df	Sig.	OR	95% CI for OR	
							Lower	Upper
Symptoms of headaches	0.63	0.58	1.20	1.00	0.27	1.89	0.61	5.87
Symptoms of nausea	0.90	0.69	1.71	1.00	0.19	2.45	0.64	9.38
Time served at YOI (<1 month)			11.92	3.00	0.01**			
Time served at YOI (2 - 6 months)	1.28	0.64	4.04	1.00	0.04*	3.61	1.03	12.63
Time served at YOI (6 months - 1 year)	2.54	0.86	8.65	1.00	0.00**	12.62	2.33	68.41
Time served at YOI (1 - 2 years)	-0.20	0.92	0.05	1.00	0.83	0.82	0.14	4.92
HAD-A score	0.07	0.08	0.66	1.00	0.42	1.07	0.91	1.25
HAD-D score	0.14	0.09	2.40	1.00	0.12	1.16	0.96	1.39
Constant	-2.40	0.75	10.30	1.00	0.00	0.09		

TABLE 4: LOGISTIC REGRESSION MODEL: HEALTH LITERACY RELATED TO RISK OF DISEASE AND PREVENTION

	B	S.E.	Wald	df	Sig.	OR	95% CI for OR	
							Lower	Upper
Symptoms of sleep problems	0.68	0.51	1.76	1	0.19	1.97	0.72	5.40
HAD-A scores	0.06	0.09	0.43	1	0.51	1.06	0.89	1.25
HAD-D scores	0.09	0.11	0.71	1	0.40	1.09	0.89	1.35
SPANE overall affect scores	0.02	0.04	0.23	1	0.63	1.02	0.94	1.12
Constant	-0.09	0.87	0.01	1	0.92	0.92		

TABLE 5: LOGISTIC REGRESSION MODEL: HEALTH LITERACY RELATED TO HEALTH PROMOTION

	B	S.E.	Wald	Df	Sig.	OR	95% CI for OR	
							Lower	Upper
IEPS (basic)			5.84	2.00	0.05			
IEPS (standard)	0.33	1.21	0.07	1.00	0.78	1.39	0.13	15.02
IEPS(enhanced)	-1.11	1.25	0.79	1.00	0.37	0.33	0.03	3.83

Symptoms of sleep problems	0.82	0.59	1.94	1.00	0.16	2.27	0.72	7.18
HAD-A scores	0.15	0.11	1.90	1.00	0.17	1.16	0.94	1.44
HAD-D scores	-0.15	0.13	1.31	1.00	0.25	0.86	0.67	1.11
SPANE-P scores	-0.23	0.11	4.24	1.00	0.04*	0.79	0.64	0.99
SPANE-N scores	-0.11	0.13	0.73	1.00	0.39	0.90	0.70	1.15
Constant	7.34	3.94	3.48	1.00	0.06	1541.35		

ⁱ All prisoners in England and Wales are automatically allocated to a “standard” level status on the Incentive and Earned Privileges Scheme (IEPS) which can be raised to “enhanced” (meaning additional privileges) if demonstrating good and compliant behaviour. Conversely, prisoners can be allocated “basic” as a punishment level for those who do not comply with prison regulations and protocols (meaning some removal of privileges).