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Social deprivation and oral health: A narrative review

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Abstract

Deprivation is a state of observable and demonstrable disadvantage of an individual relative to the society to which he belongs. Deprivation can be material or social. Non-participation of the individual in their roles, relationships, customs, functions, rights and responsibilities implied by membership of society is social deprivation. The indicators of deprivation are either direct/indirect and ranges from relatively simple single item asset-based measures to more complex measures. The most used indices are Townsend's Index of Material Deprivation, the Jarman Deprivation Score and the Index of Multiple Deprivation (IMD). Deprived adults have greater prevalence of dental caries and periodontitis, higher rates of tooth loss, less dental service utilization and more dental risk behaviors when compared with advantaged population. Despite the fact that overall population dental diseases levels have declined in recent decades, the socially deprived population are still suffering from many of the dental related diseases and its consequences.

Keywords: Deprivation, oral health, social deprivation

1. Introduction

Within societies, whether countries or states, there seems to exist a consistent and strong relationship between the size of the gap separating the rich from the poor^[1]. Numerous studies have demonstrated that the health of individuals from the lower end of the socioeconomic scale is markedly worse than that of individuals from the upper end^[2]. Higher morbidity and mortality rates from all causes have been reported at each lower level of the social hierarchy^[3]. Different plausible mechanisms have been postulated to explain these social inequalities^[3]. They include material, behavioral, environmental, and psychosocial characteristics^[3]. Studies found that relatively deprived areas were associated with standardized mortality rates, cancer mortality rates, suicide rates, coronary heart disease, dental caries, number of sound teeth remaining, and depression symptoms^[4].

Deprivation refers to unmet need, which is caused by a lack of resources of all kinds, not just financial^[5]. A person is considered deprived to the extent that he or she falls below the level attained by the majority of the population or below what is considered socially acceptable^[6]. The disadvantages of deprivation may occur at various levels, for example, with regard to food, clothing, housing, education or work^[6]. A distinction needs to be drawn between material and social forms of deprivation^[6]. The former involves "the lack of goods, services, resources, amenities and physical environment which are customary or widely approved in the society under consideration" while the latter involves "non participation in the roles, relationships, customs, functions, rights and responsibilities implied by membership of society"^[6].

Black's report outlines the distinction between the medical model (the engineering approach of body structure and function and disease processes) and the social model, which emphasizes "the complex effects of the economy and different forms of social organization, including the family, upon levels of health"^[7]. Taking their lead from Townsend *et al.*, and reflecting the emphasis placed on material deprivation by the Black Report, most measures attempt to reflect lack of access to resources rather than social participation^[6]. It is important also to distinguish between measurement of deprivation in different areas and the kind of people experiencing that deprivation^[5].

There is no commonly accepted definition of deprivation and no theoretical framework to guide the selection of appropriate indicators [2]. Measures of deprivation vary considerably, in terms of both the variables used as indicative of deprivation and the level at which they have been constructed [2]. They range from relatively simple single item asset based measures such as income, car and house ownership to more complex measures incorporating from four to 40 variables [2]. In addition, the finding of high correlations between deprivation scores and health does little to bring us nearer to understanding the underlying real determinants of health that may not be captured in the indices themselves [2].

While the existence of health disparities is a near universal problem, the extent to which social factors matter for health has been shown to vary by country [8]. This relationship exists across a broad range of health indicators, including dental health [2]. Oral diseases are a major global public health problem affecting over 3.5 billion people [9]. Despite considerable scientific progress in the understanding of the pathogenesis and causes of oral diseases over recent decades, the global burden of oral conditions has persisted, and is indeed likely to worsen [9]. Dental health is also related to social class whether measured by occupational status, income, parent's level of education, family income, housing tenure, car ownership and a combination of both education and income. (1) While measures of deprivation identify areas with especially poor health, the nature of the link has not been considered in dental research [2].

2. Deprivation

The word deprivation usually implies a situation that is unacceptably below some minimum standard, even though more general inequality may be accepted as at least inevitable, if not desirable [6]. Deprivation may be defined as "a state of observable and demonstrable disadvantage relative to the local community or the wider society or nation to which an individual, family or group belongs" [6]. Runciman formulates the concept that a person's feeling of deprivation arises out of comparing his situation with others those who are better off in the society: 'The magnitude of a relative deprivation is the extent of the difference between the desired situation and that of the person desiring it' [10].

The idea of deprivation is applied to conditions (that is, physical, environmental and social states or circumstances) rather than resources [6]. People with the same resources may display a different relationship to forms of deprivation while people with fewer resources than others may be much more likely to experience forms of deprivation even when their resources remain considerably above the 'poverty line' [6].

3. Types of deprivation

Deprivation takes different forms in every known society. People who lack the proper diet, housing, household facilities, clothing, environmental, educational, working and social conditions, activities and facilities which are customary, or at least widely approved and encouraged, in the societies to which they belong can be considered as deprived [6].

Peter Townsend classified deprivation in to two forms: material and social:

Material deprivation involves "the lack of goods, services, resources, amenities and physical environment which are customary or widely approved in the society under consideration" such as a car, a television or a neighborhood with green space [2]. Material deprivation should be distinguished from "poverty," which is more related to lack of

the resources-especially the financial resources-needed to acquire modern goods and commodities [11]. From a theoretical point of view, material deprivation is multidimensional poverty [12]. In particular, a multidimensional poverty measure takes into consideration all the dimensions of well-being that may be of relevance (including nonmaterial attributes, such as health status and political participation) [12]. People who enjoy a higher material standard of living are less probable to be deprived of basic material needs [2].

On the other hand, social deprivation involves "non-participation in the roles, relationships, customs, functions, rights and responsibilities implied by membership of society" [2]. It refers to relationships among individuals in the family, the workplace and the community [11]. It is more closely related to the concept of "social capital," reflecting certain characteristics of social organization, such as isolation or cohesion, individualism or cooperation, mutual assistance and trust [11].

Social exclusion emphasizes both a person's or a groups inability to participate in social, economic, political, and cultural life and also their relationships with others [3]. People experience a multitude of different types of social exclusion processes such as homelessness, school exclusions, or long term unemployment in the most disadvantaged social groups and communities [3]. Those who are relatively poor but not excluded may experience similar deprivations, such as poor living conditions or unemployment [3]. However their exposure to the range and length of deprivations may be limited compared with those who are socially excluded [3]. Both material and social deprivation falls as income per capita grows and are lower in countries where incomes are distributed more equally [13].

4. Indicators and measurements of deprivation

Deprivation is generally recognized as a composite concept, in that there is no single variable that can be said to measure it but rather a number of variables must be combined in some way [14]. Indicators of deprivation may be direct or indirect, representing conditions or states or victims of those conditions or states [6].

Measures of deprivation vary considerably, in terms of both the variables used as indicative of deprivation and the level at which they have been constructed [2]. These differences arise because there is no commonly accepted definition of deprivation and no theoretical framework to guide the selection of appropriate indicators [2]. Many indicators were developed because conventional measures of socio-economic status, such as social class and household income, are increasingly difficult to apply to modern populations [2].

Measures of deprivation have been applied at the level of the individual, household and area [2]. They range from relatively simple single-item asset-based measures such as income, car and house ownership to more complex measures incorporating from four to forty variables [2]. Single-item measures like the percentage of unemployed in an area or the percentage of households without a car have been used and shown to predict health outcomes as well as, or better than, more complex indicators [2]. However, composite measures, which combine several indicators, have been more frequently used because of concerns that a single variable may be inadequate to address what is probably a multidimensional phenomenon [2].

4.1 Material Deprivation: Includes dietary deprivation (6 indicators); physical and mental health (5 indicators); clothing

(4 indicators); housing (8 indicators); household facilities (9 indicators); environment (5 indicators); work (conditions, security and amenities) (12 indicators).

4.2 Social Deprivation: Includes social—family activities (4 indicators); social—social support and integration (4 indicators); social—recreational (2 indicators); social—educational (1 indicators). This included rights to employment, family activities, integration into community, formal participation in social institutions, recreation and education^[6].

Generally used deprivation indices are Jarman Index (1983), the DoE Indicators of Urban Deprivation (1983), the Townsend Index (1988), the Carstairs Index (1989), the LWT Breadline Britain Index (1991) the Index of Local Conditions (DoE, 1995)^[15]. In dental research Townsend's Index of Material Deprivation, the Jarman Deprivation Score and the Index of Multiple Deprivation (IMD) are used commonly^[16].

Jarman underprivileged area score (UAI) index, a general measure of deprivation, was specifically designed to help decide the allocation of resources in the health service^[14]. The Jarman UAI is a more complex index to measure deprivation, involving a summation of eight weighted variables, which attempts to measure deprivation and to assess levels of need for primary care and general medical practitioner workloads^[2]. Jarman UAI is a good example of a weighted index^[2].

The DoE Indicators of Urban Deprivation (1983) includes list of eight indicators: Percentage of economically active persons who are unemployed, overcrowded households, single parent family households, those households lacking exclusive use of two basic amenities, pensioners living alone households, population change percentage, standardized mortality rate and percentage of households in which the head was born in the New Commonwealth or Pakistan^[15].

Townsend Index uses four indicators to assess material deprivation, namely: percentage of economically active persons who are unemployed, percentage of households with no car, percentage of households not owner-occupied and percentage of households overcrowded^[2].

Carstairs & Morris used a similar array of variables: overcrowding, no car, male unemployment and percentage of all persons in households where the head is in a semi skilled or unskilled occupation^[2].

The IMD has seven domains which are measured separately with various indicators in each domain^[16]. The seven domains are: income, employment, health, education (skills and training), barriers to housing, crime and living environment^[16]. A weighting of these seven domains provides an overall area level aggregate score^[16].

There is a need to develop social deprivation indices to determine the socially deprived individuals and communities and apply these indexes to find out the relationship and long term association of social deprivation and oral health for implementation of policies and regulations to protect the socially deprived.

5. Social class, deprivation and health

Socio-economic factors are pivotal determinants in health^[17]. The relationships between socioeconomic status (SES) and health are well investigated and established^[18]. A 'social gradient' in health exists where increasing quantities of social resources such as education, social class, or income correspond with increasing levels of health in a dose-response relationship^[8]. Epidemiological studies have shown that health and diseases are not equally distributed in social

classes^[17]. Certain diseases (e.g., coronary heart disease, hypertension, diabetes) have shown a higher prevalence in upper classes than in the lower classes^[17]. There is a relationship between income distribution and life expectancy among industrialized countries^[10]. Individuals in the upper social classes have a longer life expectancy and better health and nutritional status than those in the lower social classes^[17]. This suggests that it is not the richest societies which have the best health, but the most egalitarian^[1]. The extent of inequality, or relative poverty, determines health^[1].

Health is one of the most important factors in the multidimensional process of social exclusion and it has significant implications for a number of socio economic outcomes determining wellbeing at an individual and social level^[13]. Deteriorating health can lead to loss of income, poverty and social exclusion and thus helps to understand the effect of health on deprivation and social exclusion^[13]. At the same time social exclusion may further contribute to ill-health^[13].

Material and social deprivation are with increased mortality, morbidity and is also associated with mental health, such as short term and long term use of psychiatric services and criminal behavior^[11]. These forms of deprivation may be used as a guide in managing public health services, especially in the area of medical resources^[11].

The finding of high correlations between health and deprivation scores does little to bring us nearer to understanding the underlying real determinants of health that may not be captured in the indices themselves^[2]. They suggest that the influence of different elements of deprivation need to be explored in order to establish the causal links between modifiable aspects of daily life and the environment which affect mortality and morbidity^[2]. However, a truly social model of health would focus not only on the characteristics of communities but also on the broader economic and social structures that determine the distribution of material goods and resources and thereby create deprivation^[2].

6. Social deprivation and oral health

Oral health is an important part of general health. Poor oral health can have adverse effects on general health^[19]. Social factors are involved not just with the etiology of oral problems, they are also implicated with the very processes by which those problems come to be defined and seen as socially significant^[20]. In oral health care, there is an array of clearly defined actions that individuals can perform to maintain and enhance their health^[20]. These actions or practices, however vary strongly by social group and reflect powerful society-wide cultural influences that are more closely linked to behavior^[20]. An important way in which social factors determine oral health is in patterns of active prevention and self-care^[2]. Many measures of mortality, morbidity and self-reported health vary across deprivation categories, it would be alarming to say the least if patterns of oral disease did not show a similar distribution^[2]. Although many studies have explored the relationships between oral health status and conventional measures of socioeconomic status, the study of the links between oral health and social deprivation is in its infancy^[2]. Most of them repeat rather than extend previous research which used social class as an indicator of socioeconomic status^[2].

Commonly used indices in dental research are Townsend's Index of Material Deprivation, the Jarman Deprivation Score and the Index of Multiple Deprivation (IMD). All studies

conducted to date confirm the link between deprivation and oral health and convincingly demonstrate the relatively poor health experience of individuals living in areas of deprivation. In addition, it is unclear in the dental and other research conducted to date if deprivation is being used as an alternative to social class or is posited as the mechanism which links social class and health outcomes^[2].

It is argued that oral epidemiology is held back by the absence of a theoretical framework of the causal pathways between social structure, social life and oral health and disease. This theoretical void impacts on the ability of oral epidemiology to explain the social causes of oral disease, and understand the biological pathways through which the social is embodied. Although many studies have explored the relationships between oral health status and conventional measures of socioeconomic status, the study of the links between oral health and deprivation is in its infancy^[2].

The role and value of the measures in pursuing explanations of the link between social deprivation and oral health has not yet been fully elucidated nor explored. Hence this paper aims to review the literature pertaining to deprivation, types, measurements, social deprivation and its relationship with oral health.

All the studies pertaining to social deprivation and oral health are based on cross sectional design: some were retrospective studies^[1, 16, 21-24] performed using data collected from previous studies or surveys. The studies are almost conducted in England, largely concerned with children and focused mainly on dental caries experience as an outcome. Only few studies were performed to understand the association between social deprivation and other oral conditions like dental trauma^[21, 25] dental fluorosis^[16, 23, 26] dental erosion^[24] tooth loss^[27] dental service utilization^[28] etc. Jarman Index^[22, 23, 25, 26] Index of Multiple Deprivation^[16, 28] and DEPCAT^[21, 29] are used.

Dental caries is strongly associated with socioeconomic deprivation^[23] Deprivation per se does not cause tooth decay, and the proved determinants of dental decay include an increase in oral health behavioral risk factors such as high frequency of sugar intake, less frequent tooth brushing with a fluoride toothpaste and an unwillingness to follow or an inability to afford a non-cariogenic diet^[18] Few interventions, however, have been shown to influence these behavioral factors^[18] For children, the parental SES can influence both general and oral health^[18].

The prevalence of dental caries was more in socially deprived individuals when compared to affluent individuals^[1, 16, 22, 23] in majority of studies. In 5 year old children dental caries showed a strong positive association with deprivation^[23] and the dental caries experience was up to five times higher in the most deprived areas than in the most affluent areas^[18, 22]. When controlled for caries, there was an association between deprivation and the isolation frequency of *Streptococcus*, *Lactobacilli* and yeasts among children less than 5 years^[29]. The relationship between social deprivation and the isolation frequencies were complex^[29]. In one study none of the deprivation measures were statistically significantly associated with mean DMFT scores while indicator of social inequalities, was negatively statistically significantly associated with dental caries experience^[1].

Subjects in the fluoridated area had significantly less caries experience than the non-fluoridated area^[16, 23]. More deprived an area is, the greater benefit 5 year old children derive from water fluoridation^[23]. Given that fluoridation, as a whole population strategy, can reduce but not eliminate inequalities,

other interventions that benefit the deprived need to be identified and implemented^[2]. Higher deprivation were more likely to have dental fluorosis^[26]. Children in non-fluoridated, affluent districts are more likely to have smooth surface wear compared with children in deprived fluoridated districts^[24]. Interaction of fluoridation and brushing teeth twice daily resulted in reduced risk of tooth wear in children residing in less deprived fluoridated areas^[24].

In a study the incidence of traumatic dental injuries was significantly higher in socially deprived areas when compared to affluent areas^[25] whereas another study failed to find significant association between risk of dental injury and increasing deprivation^[21]. Hence the relationship between traumatic dental injuries and social deprivation is inconclusive.

Deprived adults experienced higher levels of psychological stress, risk behavior and retention of teeth^[27]. The association observed between deprivation and tooth loss could be attributed predominantly to the effects of deprivation on risk of dental disease, and on decisions to treat dental disease with extraction^[27]. Across all older age stratifications, the more deprived patients had a higher rate of examinations, extractions, dentures, preventative advice and lower rate of fillings and complex restorative treatment compared to the least deprived patients^[28]. Prevalence of complete dentures and fixed bridges-the indicators of tooth loss, were strongly associated with both low social class and insufficient social network and support. People with low social participation and low cohabiting status had fewer functioning teeth^[11].

These descriptive studies are also limited by the fact that they give no indication of how these measures of deprivation compare with conventional measures such as social class in terms of their ability to identify variations in oral health^[2]. Deprivation indices describe the social composition of the populations in an area and do not describe the cultural or physical aspects of areas that may have a positive or negative influences on the health of the population^[2]. In addition, it's unclear within the dental and other research conducted up to now if deprivation is getting used as an alternate to socio-economic class or is posited because the mechanism which links socio-economic class and health outcomes. In this regard, most research in dentistry using indicators of deprivation lacks any conceptual or theoretical basis^[2].

7. Summary and conclusion

Most people in the developed countries, and the elite of the developing countries, enjoy all the determinants of good health adequate income, nutrition, education, sanitation, safe drinking water and comprehensive health care. The health of individuals from the lower end of the socioeconomic scale is markedly worse than that of individuals from the upper end. The morbidity and mortality rates from all causes have been reported are higher at each lower level of the social hierarchy and in deprived population.

Deprivation is a state of observable and demonstrable disadvantage relative to the society to which an individual belongs. Deprivation refers to unmet need, which is caused by a lack of resources like goods, services, resources, amenities, non participation in the roles, relationships, customs, functions, rights and responsibilities implied by membership of society. The concept of poverty must be distinguished from the idea of deprivation which is applied to physical, environmental and social states rather than income of the individual/family. Deprivation can be material or social.

Social deprivation is the non-participation of the individual in

the roles, relationships, customs, functions, rights and responsibilities implied by membership of society. The relationship between social deprivation and health varies from country to country. Social deprivation negatively impacted the general health.

Earlier deprivation was measured by means of socioeconomic status, poverty etc. Later many deprivation indices were developed because conventional measures of socio economic status, such as social class and household income are difficult to apply to modern populations. The indicators of deprivation ranges from relatively simple single item asset based measures to more complex measures incorporating four to 40 variables and may be direct or indirect. The most commonly used indices are Townsend's Index of Material Deprivation, the Jarman Deprivation Score and the Index of Multiple Deprivation (IMD). Measures of deprivation were able to prove that the poor health was associated with deprived individuals while the nature of the link has not been considered in dental research. The indexes or measures to quantify the effect should be modified in such a way that the effect of social deprivation on oral health can be traced rather than the effect of material deprivation.

Dental health is related to social class whether measured by occupational status, level of education, family income etc. A few studies have assessed association with social deprivation and dental health. All the studies demonstrated that the relatively poor oral health experience is more with the individuals with higher levels of deprivation. Deprived adults have greater prevalence of dental caries and periodontitis, higher rates of tooth loss and more dental risk behaviors when compared with advantaged population. Deprived individuals were having more of dental caries when compared to less deprived individuals and water fluoridation reduced the difference in the social gradient between the deprived and less deprived. The association between the dental trauma and the social deprivation was inconclusive. The dental service utilization was less with the deprived population.

Despite the fact overall population dental diseases levels have declined in recent decades, the socially deprived population are still suffering from many of the dental related diseases and its consequences. This may affect their oral health related quality of life adversely. Further longitudinal studies should be performed to understand the effect social deprivation on oral health in various populations and communities.

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8. References

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