Ethnicity and Stress at Work: A Literature Review and Suggestions for Future Research

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Authors' contributions

This work was carried out in collaboration between all authors. All authors read and approved the final manuscript.

Review Article

ABSTRACT

Aims: Ethnicity and culture represent a novel topic in the literature on stress and wellbeing at work because there has not been enough consideration of them in studies of work stress. This paper aims to present a critical review and evaluate recent articles investigating ethnicity in the literature on stress and wellbeing at work to identify limitations of previous research concerning all the aspects related to the cultural dimensions in this research area.
Methodology: Pubmed, PsycInfo and Scopus databases were searched for articles dealing with ethnicity and occupational health for the years 1985 to 2014. The studies were divided into three categories as follows: ethnicity and occupational mental health, ethnicity and occupational physical health, ethnicity and work stress.
Results: Sixty articles were selected, 26 on occupational mental health, 13 on physical health and 21 on work stress. None of the studies used a transactional perspective or took as a framework of reference general models of stress that integrate all the aspects related to ethnicity with work-

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related dimensions. Most of the reviewed studies measured ethnicity as a descriptive category of the working population studied (i.e. country of birth, nationality, language, skin colour, origin, racial group) or focused on the differences between ethnic groups and it has failed to consider the salient cultural aspects such as acculturation strategy, cultural identity and perceived racial discrimination. **Conclusions:** The gap in the work stress literature on different aspects of ethnicity suggests further consideration of the potential role of cultural dimensions as individual differences or as potential sources of stress in work stress models and shows the need to develop and test a general model that integrates ethnicity and work-related stress in a transactional perspective.

1. INTRODUCTION

There has been very little research on ethnicity and occupational health, and even less on discrimination experiences, cultural identity, acculturation strategies and health outcomes among workers. The concept of ethnicity changes over time and the concept of race, ethnicity and nationality are mixed up together. Ethnicity could be defined as a nation or group who share one or all of the following: a common nationality, culture, language, race, religion and common descent [1-5]. Many anthropologists, psychologists and sociologists generally agree that ethnic categories are imprecise and arbitrary, "social constructions rather than natural entities that are simply 'out there' in the real world" [6]. Even in an ethnic group whose members share a relatively precise ethnic label there is heterogeneity in terms of gender, social class and education, generation of immigration, geographical region, family structure and size and composition of the ethnic community [7]. Therefore ethnicity is not a static concept and ethnic group is a self-defined category. For this reason one cannot measure ethnicity using objective categories in the same way as gender or marital status and ethnicity is associated with the concept of "culture". In 1952 Kroeber and Kluckholm [8] cited 164 definitions of culture, illustrating the difficulty in achieving a comprehensive definition. By 1981 Budde et al. [9] stated researchers were still unable to conceptualise and define 'culture'. Triandis et al. [10] describes culture as "a fuzzy, difficult to define construct". Furthermore, LaFramboise et al. [11] criticise definitions of culture for either omitting a salient aspect of culture or generalising beyond any real meaning.

Cultural dimensions are very complex because they are related to three core concepts:

- Acculturation represents "phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both group" [12];
- Ethnic identity is the feeling of being included in a group or culture;
- When people insult other people, make fun of them, or treat them unfairly because they belong to a certain racial/ethnic group, this is called discrimination [13].

One of the issues in the literature on work-related stress is that it has not considered the complex nature of ethnicity and the relationship with cultural dimensions like acculturation, discrimination and ethnic identity. Measures of work characteristics and/or work stress have been developed largely within single ethnic group data sets. Most of studies measure ethnicity as a descriptor of the working population studied or as an objective category (i.e. country of birth, nationality, language, skin colour, origin, racial group) and associate some other descriptors (such as exposure to discrimination) with psychophysical health conditions [14-16], work characteristics or appraisals [17,18] as single associations rather than in a general model that integrates all the ethnicity aspects and work-related dimensions in a transactional perspective.

The literature makes a distinction between two types of psychological model of work stress, *interactional* or structural approaches, such as the DCS (Demand-Control-Support) model [19], and *transactional* or process models. Interactional models focus on the structural characteristics of the stress process, i.e. which stressors are likely to lead to which outcomes in which populations, however transactional views are more cognitive, and focus on the dynamic

relationship that occurs between individuals and their environment in terms of mental and emotional processes [20]. Transactional views often place emphasis on the role of subjective perceptions of the environment, and are more likely to acknowledge the possible impact of individual difference factors, such as differences in coping, appraisal, personality, and locus of control. Particularly relevant in the field of occupational stress was the new approach of the DRIVE (Demand-Resources-Individual effects) model proposed by Mark & Smith [21] which simultaneously compared a number of job characteristics and individual difference variables in the prediction of anxiety, depression, and job satisfaction, and tried to account for the role of important individual difference factors in the development of subjective experiences of stress, and in influencing the possible health-related outcomes that result from subjective stressful perceptions.

Usually approaches are based on data collected from mainly white workers and previous research on ethnic minorities and occupational health either used an epidemiological approach, an interactional or structural approach, a management standards approach focused on work stressors, or a mixed approach that tries to integrate social and cultural aspects. However, a specific application of these approaches for effectiveness in a multi-cultural workforce is largely untested and an alternative approach would be a greater incorporation of cultural issues into a general transactional perspective to ensure that such practices and findings are effective and relevant across ethnic groups.

The literature reported is, therefore, an oversimplification and reduction of the multidimensional construct of ethnicity and this debate could be relevant to understand the possible role of the cultural dimensions in the work related stress models. Finally all the aspects of ethnicity may be considered in the association with occupational health as descriptors but also as individual difference or potential source of pressure in the stress models.

1.1 Aims

This paper aims to present a critical review of ethnicity and occupational stress to identify gaps in the work stress literature and to propose a model (taking a cue from the DRIVE model) that integrates a transactional perspective of stress with the different cultural dimensions.

In particular this critical review moves from following issues:

- Issue 1: Studies reported in previous work stress literature focused on single associations between ethnicity and occupational mental/physical health or work stress.
- Issue 2: These studies considered ethnicity only as a descriptor of the working population studied or as an objective category (i.e. country of birth, nationality, language, skin colour, origin, racial group) rather than a complex construct related to acculturation, discrimination and ethnic identity.
- Issue 3: Ethnicity aspects might be considered as individual differences or potential sources of stress in general work related stress models.

Therefore the current study suggests and describes a multidimensional model of work related stress that integrate all the aspects related to ethnicity with work-related dimensions and hypothesizes significant profiles of associations between individual differences, work characteristics, ethnicity dimensions, perceived job satisfaction/stress and occupational health outcomes in workers differing in ethnicity.

2. METHODOLOGY

2.1 Search Criteria and Identification of Studies

For the purpose of this review the starting point was to search and select the studies presented in the current literature on ethnicity and occupational health in order to position our research in this area and to propose a new approach.

The search was performed using Pubmed, PsycInfo and Scopus databases. The search criteria included general ethnicity terms (such as "culture, acculturation, ethnic identity, discrimination, nationality"), general psychophysical health outcomes (such as "depression", "anxiety", "physical problems" and "occupational health"), work characteristics and occupational stress ("demands", "resources", "rewards", "job satisfaction" and "work stress"), and individual differences (e.g. "personality" and

"coping behaviour") using all possible combinations of these index terms.

Each article was analysed for items listed in Table 1 considering the authors and the year of publication, the ways of measuring ethnicity and job characteristics, the work-related health outcomes associated with them and the type of approach applied in each study.

Table 1. Information extracted from each article

1. Name of authors
2. Year of publication
3. Measure of ethnicity
4. Measure of job characteristics
5. Health outcomes
6. Approach

In particular the measuring of ethnicity refers to all the aspects related to ethnicity and cultural dimensions (i.e. country of birth, nationality, language, skin colour, origin, racial group, acculturation strategies, ethnic identity, perceived discrimination); the job characteristics refers to occupational factors such as occupational groups (job type), employment status (type of contract, work status, salary), work environment (work stressors) and work characteristics in accordance with the major work stress models like Karasek [19] and Siegrist [22] models. Furthermore the last two items listed in Table 1 reported for each study the health outcomes associated with ethnicity and work characteristics and the approaches used.

One hundred fifty-two articles were identified and on further examination of the content, some articles were removed for not including occupational health but acculturation stress as outcomes, other studies for using a sociological approach and others for focusing on a transcultural psychiatry approach. Therefore sixty articles were included in the final review and most of these studies took into account ethnicity as a descriptor of the working population studied and only a few of them considered other aspects of the ethnicity. These identified studies were categorized by the health outcomes associated with ethnicity as follows: 1) studies showing ethnicity and occupational mental health, 2) ethnicity and occupational physical health, 3) ethnicity and work stress.

3. RESULTS

3.1 Description of Studies

In accordance with these inclusion criteria the most representative studies will be described for each category in order to show what in the literature is present and to identify gaps. Of these 60 selected articles, there were 26 on occupational mental health, 13 on physical health and 21 on work stress and most of them were published in the last 30 years with the majority in the last 15 years. Working populations and ethnic groups varied among these studies. The selected articles with the extracted items are chronologically summarized in Table 2.

All of the studies on occupational physical health used an 'epidemiological approach', while the papers on mental health and work stress showed a variety of approaches (interactional or structural approaches, a management standards approach and a mixed approach). Few studies suggested that a global approach must be adopted, nor did they have the capacity to address issues that are unique to any single ethnic group. Table 3 shows the 60 selected articles divided into three categories reported above.

The first category of reviewed studies focused on single associations between poor mental health and ethnicity and job characteristics. None of these 26 studies summarized in Table 3 referred to a transactional perspective nor took as framework of reference general models of stress that integrate all the aspects related to ethnicity dimensions with work-related dimensions. Most of these studies measured ethnicity as a descriptor of the migrant working population studied or as an objective category (i.e. nationality, country of birth, language, skin colour, origin and racial group) associated with occupational factors in the prediction of mental health.

The second group consisted of 13 studies investigated ethnicity and occupational physical health especially in terms of musculoskeletal disorders, respiratory problems, cancer, and cardio-vascular disease. All of the studies can be classified as "epidemiological" and focused on single associations of ethnicity such as nationality or country of birth with physical problems in different working populations.

Table 2. Features of articles investigating ethnicity and occupational health

Reference	Author	Year	Measure of ethnicity	Measure of job characteristics	Health Outcome	Approach
[67]	Jackson et al.	1985	Nationality, episode of discrimination and harassment	Occupational group, work environment	Work stress	Occupational stress (interactional or structural)
[56]	Palinkas et al.	1985	Race, genetic susceptibility, cultural patterns of belief and behavior	Occupational group, work environment, occupational risk	General physical diseases	Occupational Ill Health/ work-related illness (Epidemiological)
[57]	Murray	1986	Different ethnic groups, and genetic susceptibility	Occupational groups	General physical diseases	Occupational Ill Health/ work-related illness (Epidemiological)
[52]	Bergeret et al.	1990	Ethnic origin	Occupational group, habits and work related stress behaviors (drinking and smoking, drug)	Cardio-vascular diseases	Occupational Ill Health/ work-related illness (Epidemiological)
[23]	Moghaddam et al.	1990	Nationality combined with sociocultural aspects	Occupational group, occupational change and difficulties	General mental health	Social and cross-cultural psychology (mixed approach)
[68]	Netemeyer et al.	1990	Nationality	Occupational group, work stressors	Work stress	Occupational stress (interactional or structural)
[53]	Chia et al.	1991	Different ethnic minorities	Occupational groups, workplace hazards, habits and work related stress behaviors (smoking and drinking)	Cardio-vascular diseases	Occupational Ill Health/ work-related illness (Epidemiological)
[54]	Hodgkins et al.	1991	Nationality	Occupational group, habits and work related stress behaviors (smoking)	Cardio-vascular diseases	Occupational Ill Health/ work-related illness (Epidemiological)
[24]	Moon et al.	1991	Nationality, cultural factors	Occupational group, alienation	General mental health	Social and cross-cultural psychology (mixed approach)
[25]	Thompson	1991	Nationality	Occupational group	Emotional regulation	Psychology of emotions

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Reference	Author	Year	Measure of ethnicity	Measure of job characteristics	Health Outcome	Approach
[26]	Furnham et al.	1993	Nationality, differences in generation, assimilation	Occupational group, social support.	Psychological symptomatology	Social and cross-cultural psychology (mixed approach)
[49]	Betemps et al	1994	Different ethnic groups	Occupational groups	Cancer	Occupational Ill Health/ work-related illness (Epidemiological)
[27]	Frye et al.	1994	Nationality and family aspects	Occupational group, income	General mental health	Occupational and Health Psychology(mixed approach)
[69]	Kandola	1994	Different ethnic groups	Occupational groups, shifts	Work stress	Occupational stress (interactional or structural)
[28]	Kim et al.	1994	Nationality and acculturation strategy	Occupational group, family income, nonprofessional occupation.	Depression	Epidemiology and culture
[29]	Lipson et al.	1994	Nationality, loss of status, ethnic bias, belief and values	Occupational group, occupational and financial difficulties	Anxiety, depression, somatisation	Occupational and health Psychology(mixed approach)
[70]	Walcott-McQuigg	1994	Nationality, harassment and gender	Occupational group, work stressors, negative work environment, social interactions	Work stress and work related stress behaviors (alcohol and tobacco)	Occupational stress and work related stress behavior
[30]	Hattar-Pollara et al.	1995	Nationality, cultural identity	Occupational group	General mental health	Health Psychology(mixed approach)
[59]	Peterson et al.	1995	Different races and cultural contexts	Occupational groups, work environment	Perceived work stress	Occupational stress (interactional or structural)
[74]	Ragland et al.	1995	Ethnic differences	Occupational groups, work stressors.	Work stress and work related stress behavior (alcohol)	Occupational stress and work related stress behavior
[76]	Ames et al.	1996	Nationality with gender (female)	Occupational group, shifts and environment	Work stress and work related stress behavior (alcohol)	Occupational stress and work related stress behavior

Reference	Author	Year	Measure of ethnicity	Measure of job characteristics	Health Outcome	Approach
[71]	Netemeyer et al.	1996	Nationality	Occupational group, work demands, work overload (socio-psychological stressors)	Work stress and related psychosomatic problems	Occupational stress (interactional or structural)
[77]	Grube et al.	1997	Nationality with gender (male)	Occupational group, shifts and environment	Work stress and work related behavior (alcohol)	Occupational stress and work related stress behavior
[46]	Wagener et al.	1997	Nationality, country, race	Occupational group, manual and repeated activities	Back pain problems	Occupational Ill Health/ work-related illness (Epidemiological)
[31]	Aroian et al.	1998	Nationality, novelty, language difficulties, discrimination, not feeling at home, length of time in the host country	Occupational group, employment. status, occupational change	Psychological distress	Social and cross-cultural psychology (mixed approach)
[47]	Bradshaw et al.	1998	Nationality	Occupational group, years of work experience, habits and work related stress behavior (smoking)	Respiratory problems	Occupational Ill Health/ work-related illness (Epidemiological)
[58]	Conrad et al.	1998	Nationality, genetic susceptibility	Occupational groups, geographic position of workplace	Dermatological problems	Occupational Ill Health/ work-related illness (Epidemiological)
[50]	Ma et al.	1998	Different race/ethnic sub-populations	Occupational groups	Cancer	Occupational Ill Health/ work-related illness (Epidemiological)
[72]	Spector	1998	Nationality	Occupational group, work stressors	Work stress	Occupational stress (interactional or structural)
[61]	Jamal	1999	Country	Occupational groups, work demands, over-time work, income, job satisfaction	Work stress	Occupational stress (interactional or structural)
[64]	Klonoff et al.	1999	Nationality and episode of discrimination	Occupational group	Work stress and stress symptoms	Occupational stress and culture

Reference	Author	Year	Measure of ethnicity	Measure of job characteristics	Health Outcome	Approach
[60]	Lu	1999	Different races and cultural context	Occupational groups, work related stressors, intention to quit, job satisfaction	Perceived job stress and job satisfaction	Occupational stress (interactional or structural)
[75]	Yen et al.	1999	Nationality, episode of racial discrimination	Occupational groups, workplace environment	Work stress and work related stress behavior (alcohol)	Occupational stress and work related stress behavior
[32]	Aroian et al.	2000	Nationality, immigration demands	Occupational groups, socio-economic factors related to employment status	Resilience, depression	Stress-resistance and cognitive appraisal of stress
[34]	Comino et al.	2000	Nationality	Occupational groups, employed vs unemployed	Anxiety, depression	Epidemiology
[51]	Schulz et al	2000	Different ethnic groups, race	Occupational groups, exposure to suspected bladder carcinogens (work environment)	Cancer	Occupational Ill Health/ work-related illness (Epidemiological)
[48]	Kor et al.	2001	Nationality	Occupational group	Respiratory problems	Occupational Ill Health/ work-related illness (Epidemiological)
[55]	Sakamoto et al.	2001	Ethnic minorities, cultural influence	Occupational groups	Cardio-vascular diseases	Occupational Ill Health/ work-related illness (Epidemiological)
[62]	Kurz	2002	Country	Occupational groups income, long work hours	Work stress	Occupational stress (interactional or structural)
[63]	London et al.	2002	Country	Occupational groups, income, long work hours	Work stress	Occupational stress (interactional or structural)
[17]	Nazroo	2003	Different ethnic groups, social inequalities, racism	Occupational groups, economic inequalities	Work stress	Occupational stress and culture(mixed approach)
[65]	Troxel et al.	2003	Nationality and episode of racial discrimination	Occupational groups	Work stress and stress symptoms	Occupational stress and culture(mixed approach)
[73]	Milkie et al.	2004	Country	Occupational groups, income, long work hours	Work stress	Occupational stress (interactional or structural)

Reference	Author	Year	Measure of ethnicity	Measure of job characteristics	Health Outcome	Approach
[14]	Roberts et al.	2004	Different ethnic groups, episode of discrimination and harassment	Occupational groups, job satisfaction, salary, benefits, opportunity for development and advancement, stress and burnout, sickness absence	Psychological distress	Occupational stress and culture (mixed approach)
[18]	Szczepura et al.	2004	Ethnic minorities groups in Britain	Different occupational groups	Work stress and work-related health	Occupational stress and culture (mixed approach)
[15]	Karlsen et al.	2005	Different ethnic groups, indicators of racism (Experience of interpersonal racism and perceiving racism)	Occupational groups, socio-economic factors related to employment status	Psychosis	Epidemiology
[39]	Panayiotopoulos	2005	Nationality combined with gender	Care workers for elderly, working conditions, segregation	Depression	Stress in care workers (management standards approach)
[45]	Smith et al.	2005	Nationality, Ethnic minorities, perceived discrimination at work	Occupational groups, occupational factors, work characteristics (ERI and Karasek' Models)	Psychological and physical distress, work stress	Occupational and Health Psychology (suggested global approach)
[40]	Degiuli	2007	Nationality combined with gender	Care workers ,working conditions, segregation	Depression	Stress in care workers (management standards approach)
[33]	Li et al.	2007	Nationality	Occupational group, job type, economics factors (income)	General mental health	Occupational health (management standards approach)
[66]	Smith	2007	Ethnic minorities, perceived discrimination at work	Occupational groups, occupational factors, work characteristics (Siegrist and Karasek' models)	Work stress	Occupational and Health Psychology (suggested global approach)
[16]	Wong et al.	2008	Nationality, episode of discrimination	Occupational groups, working conditions, benefits	Psychological distress	Occupational and health Psychology (interactional or structural)

Reference	Author	Year	Measure of ethnicity	Measure of job characteristics	Health Outcome	Approach
[41]	Elrick et al.	2008	Nationality combined with gender	Care workers for elderly, salary	Depression	Stress in care workers (management standards approach)
[42]	Doyle et al.	2009	Nationality combined with gender	Care workers for elderly, working conditions, burnout	Depression	Stress in care workers (management standards approach)
[35]	Liwowsky et al.	2009	Nationality	Occupational groups, employment vs. unemployment status	Depression	Epidemiology
[38]	Seedat et al.	2009	Nationality	Occupational groups related to gender	General mental health	Management standards approach
[43]	Ahonen et al.	2010	Nationality combined with gender	Care workers for elderly, physical demands	Depression	Stress in care workers (management standards approach)
[44]	Williams	2010	Nationality combined with gender	Care workers for elderly, work-family conflicts	Depression	Stress in care workers (management standards approach)
[36]	Madianos et al.	2011	Nationality, country	Occupational groups, employment status, income	Depression	Epidemiology
[37]	Classen, et al.	2012	Nationality	Occupational groups, employment status, risk of loss job	Depression, suicide	Epidemiology

Table 3. Articles investigating ethnicity and occupational health divided into three categories

Reference	Author	Year
Ethnicity and occupational mental health (N=26)		
[23]	Moghaddam et al.	1990
[24]	Moon et al.	1991
[25]	Thompson	1991
[26]	Furnham et al.	1993
[27]	Frye et al.	1994
[28]	Kim et al.	1994
[29]	Lipson et al.	1994
[30]	Hattar-Pollara et al.	1995
[31]	Aroian et al.	1998
[32]	Aroian et al.	2000
[34]	Comino et al.	2000
[14]	Roberts et al.	2004
[15]	Karlsen et al.	2005
[39]	Panayiotopoulos	2005
[45]	Smith et al.	2005
[40]	Degiuli	2007
[33]	Li et al.	2007
[16]	Wong et al.	2008
[41]	Elrick et al.	2008
[42]	Doyle et al.	2009
[35]	Liwowsky et al.	2009
[38]	Seedat et al.	2009
[43]	Ahonen et al.	2010
[44]	Williams	2010
[36]	Madianos et al.	2011
[37]	Classen, et al.	2012
Ethnicity and occupational physical health (N=13)		
[56]	Palinkas et al.	1985
[57]	Murray	1986
[52]	Bergeret et al.	1990
[53]	Chia et al.	1991
[54]	Hodgkins et al.	1991
[49]	Betemps et al	1994
[46]	Wagener et al.	1997
[47]	Bradshaw et al.	1998
[58]	Conrad et al.	1998
[50]	Ma et al.	1998
[51]	Schulz et al	2000
[48]	Kor et al.	2001
[55]	Sakamoto et al.	2001
Ethnicity and work stress (N=21)		
[67]	Jackson et al.	1985
[68]	Netemeyer et al.	1990
[69]	Kandola	1994
[70]	Walcott-McQuigg	1994
[59]	Peterson et al.	1995
[74]	Ragland et al.	1995
[76]	Ames et al.	1996
[71]	Netemeyer et al.	1996
[77]	Grube et al.	1997
[72]	Spector	1998
[61]	Jamal	1999
[64]	Klonoff et al.	1999

Reference	Author	Year
[60]	Lu	1999
[75]	Yen et al.	1999
[62]	Kurz	2002
[63]	London et al.	2002
[17]	Nazroo	2003
[65]	Troxel et al.	2003
[73]	Milkie et al.	2004
[18]	Szczepura et al.	2004
[66]	Smith	2007

In the third category of this review most of the studies showed associations between ethnicity as descriptor with work stress and work-related stress behaviours and confirmed that ethnic minorities experience a more negative work environment leading to increase stress. They give particular importance also to the differences between ethnic groups and highlight that work stressors are influenced by different cultural contexts.

Therefore the reported literature review showed that none of the 60 studies summarized used a transactional perspective and took as framework of reference general models of stress that integrate all the aspects related to ethnicity with work-related dimensions. Moreover most of these studies (n=51, 85%) reported ethnicity as a descriptor and objective category (i.e. nationality, country of birth, origin, racial group) and only a few papers (n=8, 13%) add discrimination as an experienced episode and none conceptualise it as the perception or feeling of being discriminated against.

All these papers are analysed in more details in the following three subsections.

3.2 Ethnicity and Occupational Mental Health

In this group 11 studies [23-33] showed socio-cultural descriptive aspects and occupational factors (i.e. job type, employment status, occupational change and working conditions, salary) in association with the aetiology of mental disorders in accordance with the oversimplification of the ethnicity construct identified in this research area.

Some other studies showed the percentage of psychological symptoms for different workers varying in ethnicity using an epidemiological approach [34,15,35-37]. In this group both ethnicity and occupational factors were oversimplified and considered only for the fact that the study samples consisted of migrant workers. Two studies [34,35] also proposed an interesting comparison between employment and unemployment status.

Ethnicity and gender differences in mental health have been observed in various working populations [38]. In particular 6 studies have focused on migrant care workers as the most feminised occupation in the EU (Austria, France, Italy, the UK and Sweden for home helpers in elderly care, and Cyprus, Latvia, Iceland and Norway for childcare workers and pre-primary teachers) and this group of workers mostly reported a clinical level of depression due to segregation [39-44]. In these studies some other occupational factors such as salary, high physical work demands and work-family conflict were investigated.

In this group there were only two papers that tried to investigate in depth the relationships between cultural dimensions and work characteristics including other aspects of ethnicity like racial discrimination. Roberts et al. [14] interviewed 1,728 American workers about aspects of their jobs, their exposure to racial discrimination at work, and dimensions of mental health. American minorities reported more discrimination at work than White Americans and there was evidence of institutional discrimination against minorities. Those who reported that they had been discriminated against were found to have poorer mental health outcomes than their same-race counterparts who did not acknowledge being discriminated against. Furthermore Wong et al. [16] argued that working conditions, social security and medical benefits, education of migrant children, housing conditions, and discrimination by urban residents can be major stressors adversely affecting migrant workers' mental health. These two studies did not give enough attention to discrimination as a perception or feeling of being discriminated against but rather they just reported discrimination experiences. For this

reason discrimination reported in literature can be considered as a descriptive aspect of ethnicity.

Finally only the study conducted by Smith et al. [45] on black Caribbean and Bangladesh workers in the UK showed a significant associations between occupational health, ethnicity and work characteristics (measured with Siegrist and Karasek' models variables). This study suggested that one should investigate aspects of ethnicity like cultural identity, acculturation strategies.

3.3 Ethnicity and Occupational Physical Health

In a US study, among the currently employed reporting back pain, a higher percentage of black women had back pain due to workplace accidents or repeated activities at work than white women; a similar, but less extreme, difference was observed for men [46]. A New Zealand study found that work-related respiratory symptoms were related both to cigarette smoking and a measure of lifetime exposure to welding fumes when a group of welders and non-welders matched for ethnicity, smoking habits, and years of work experience were compared [47]. A study from Singapore has reported a higher level of symptoms in Chinese workers, with the most common causative agent being isocyanides [48].

Moreover the following three studies focus on the differences between ethnic groups in lung disease and cancer in certain occupations. A US study of wastewater treatment system workers also indicates that migrant workers are at significantly higher risk than the US white male population for various cancers, including stomach and leukemia, and diseases of the nervous system and sense organs [49]. Four years later another US study has identified differential cancer mortality risks among firefighters of different race/ethnic sub-populations [50]. Elevated cancer mortality rates has been identified for bladder cancer among African American and male Latinos in several occupational groups with exposure to suspected bladder carcinogens; It has also been observed among Asian males in sales, and for Asian females in the personal services industry [51].

Other papers focused on the effects of lead exposure (and related cardio-vascular disease) on the general health of ethnic minorities. A French study has found much higher blood lead levels in exposed workers than in controls matched according to age, sex, drinking and smoking habits, ethnic origin and drug intake [52]. Examination of the blood lead concentration among workers in a battery manufacturing factory in Singapore has identified higher concentrations among Malay workers [53]. A study from the US has found a highly significant association of blood lead levels with past exposure in lead-battery workers, after making allowance for job category, seniority, age, ethnicity, gender, and smoking habit [54]. A more recent study in US has reported that minority groups tend to be over-represented in the lead industries and that high lead levels can be compounded by cultural influences [55].

Finally 3 earlier studies conducted in US reviewed genetic susceptibility, working environment and occupational risk and argued that the relationship between race and disease is mediated by several factors, including genetic predisposition, socio-economic status and cultural patterns of belief and behaviour [56-58].This particular association between race and genetic aspects appeared very interesting in terms of integration of psychological and biological aspects in the multidimensional construct of ethnicity.

3.4 Ethnicity and Work Stress

The impact of the stressors depending on the different cultural context is reported in the followings 5 studies. People from different races and ethnic backgrounds can identify the effects of these stressors within their own cultural context [59]. In developed countries, overload correlates positively with intention to quit and negatively with job satisfaction [60], but it is viewed positively among workers in many under-developed countries because of over-time pay [61-63].

Furthermore a review of the occupational health and safety of ethnic minority groups in Britain has examined "whether certain minority ethnic groups are disproportionately affected by work-related health and safety outcomes, issues or activities" [18] and a study conducted by Nazroo [17] has reviewed evidence showing differences in health across ethnic groups. He suggests that social and economic inequalities, underpinned by racism, are fundamental causes of ethnic inequalities in health.

Two studies have also shown racial discrimination related to stress symptoms [64]

and objective signs of disease [65]. Moreover in a study conducted by Smith et al. [66] 30% of ethnic minorities reported very high or extremely high levels of stress at work compared to 18% of the white workers and it was argued that perceived work stress may be underpinned by exposure to racial discrimination at work among black African–Caribbean women and this may affect their psychological well-being.

Several studies reported that ethnic minorities experience more negative work environments stressors in terms of social interactions on the job, such as criticism, bias, and sexual harassment which can lead to stress [67-73] and also have more stress related behaviours (such as alcohol and tobacco consumption). Two US studies have examined in workplace transport staff the association between alcohol consumption, nature of work, and ethnicity and they have identified significant ethnic differences. One paper reports that heavy alcohol consumption among urban transit operators is related to several variables such as age, ethnicity, gender and marital status [74]. A further study of urban transit operators has highlighted an association between workplace racial discrimination and some measures of alcohol consumption [75].

Finally another US paper reviewing published research related to women, alcohol and work emphasizes the importance of interactions among ethnicity, class, employment, and alcohol consumption [76] and also a study conducted by Grube et al. [77] of mostly male employees in manufacturing found that problems in the workplace are associated with work-related drinking and related to age, gender, ethnicity, work shift and departments.

4. CONCLUSIONS AND SUGGESTED NEW DIRECTIONS

This critical review leads to our suggestion for a proposed of model for future research on ethnicity and occupational stress.

In accordance with the research issues, results mentioned from previous literature confirmed the lack of a general model of ethnicity and work stress and the need of describing how psychosocial and individual variables can influence occupational health in migrant workers as well as the central role played by ethnicity, work characteristics and personality patterns in a multidimensional perspective.

Moreover one of the major problems with the limited previous research on ethnicity and occupational health is that it has failed to consider important issues related to cultural dimensions such as acculturation strategy, cultural identity and perceived discrimination and their potential role in a multidimensional model of stress.

Therefore it is argued that ethnicity should be considered not only as an objective category but also as an individual difference or a potential source of pressure in the work stress models.

There is much support for effects of numerous individual difference (ID) factors on work stress and health outcomes. Different types of individual difference variables can be relevant in the stress process: demographic variables (gender, age, marital status, job tenure, job title, and hierarchical level) related to someone's job stressor/health relationships [78-80] and personality and coping that can play major roles in the processes by which psychosocial work conditions influence mental and physical health outcomes and therefore organizational health [81]. Individual differences affect our perceptions and interpretations of events around us. As Lu et al. [82] explain, massive individual differences in vulnerability to stress alter an individual's perception of a potential source of stress (direct effect), impact on the transformation of perceived stress into various consequences of stress (indirect effect), and ameliorate these stress consequences (direct effect). Briner, Harris, and Daniels [83] state that individual contexts and behaviour are vital to understand the causes of strain, stress, and coping and that it may make no sense to consider stressful job characteristics as "out there" without subjective individual perceptions taken into account.

In the field of occupational stress, the possible influence of individual differences is implicit in models that treat stressors as subjective (such as the ERI model) and very few models (such as DRIVE model) actually have an explicit role for individual difference factors integrated into them.

Therefore in the stress area each aspect of the ethnicity dimension can be relevant and needs to be considered to understand the possible role of the culture in work-related stress research and to develop and test a general model that integrates a transactional model of stress with the different cultural dimensions.

On the basis of the previous research on ethnicity and occupational health in migrant workers, the gap in the literature on cultural dimensions and stress at work and the debate on the role of culture in the work stress models, a multidimensional model of stress which simultaneously compared a number of job characteristics, individual differences, ethnicity dimensions and appraisals in the prediction of psychophysical health conditions in migrant workers will be proposed. The Demand-Resources-Individual effects model was considered as a framework of reference for our proposed model.

The suggested model can be seen (Fig. 1) and testing it formed the basis for the further research [84,85]. All the dimensions involved in this model, namely individual differences, work characteristics, perceived job stress and ethnicity are all proposed to have main effects on health outcomes and each aspect of ethnicity such as acculturation strategies, perceived racial discrimination and ethnic identity could be related to occupational health either as demographic variables, individual differences or potential sources of pressure.

Moreover perceived job stress factor (as suggested by DRIVE model) is hypothesised to be the mechanism by which levels of workplace psychosocial factors can affect health outcomes and in accordance with the Karasek [19], Karasek & Theorell [86] and Siegrist [22] models, Klonoff et al. [64], Troxel et al. [65], Roberts et al. [14], Smith et al. [45], Mark and Smith [21] perceived work resources as well as perceived discrimination could have interact with job demands in the prediction of specific health outcomes in the proposed model.

The importance of this multidimensional model is give closer attention to the acculturation strategies and perceived racial discrimination that influence over the relationships between each work - related stress dimension and health outcomes. Furthermore the employment status of different ethnic groups and certain aspects such as school education may contribute to improve a different format of intervention aimed at supporting migrant workers in the relationships within and with the work environment.
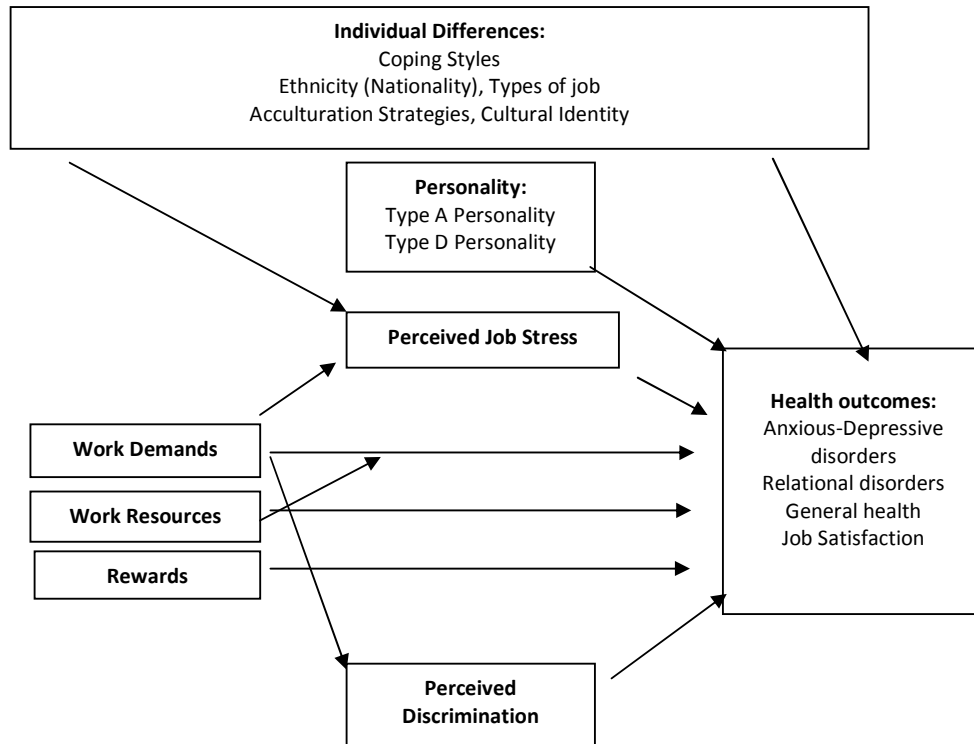

Fig. 1. An ethnicity and work-related stress model

Therefore this suggested model could provide a basis for the development of future work, and a characterisation of the stress process that is dynamic and may have comparable or better ecological validity than many existing stress models. Moreover it might lead to a focus on the topic of ethnic minorities and work-related ill-health which in the past has been an under researched area that sometimes is overlapped with sociology, cross cultural psychology and social psychology which leads to the loss of specificity and objectives. In parallel with this type of approach it is essential to consider different conceptualisations of ethnicity and culture as well as the integration of the work related stress research and the cross cultural approach, and the interplay of mixed and single cultural work environments.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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