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Epidemiology of Psychological Distress

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1. Introduction

Psychological distress is widely used as an indicator of the mental health of the population in public health, in population surveys and in epidemiological studies and, as an outcome, in clinical trials and intervention studies. Yet the concept of psychological distress is still vague for some. Indeed, a closer look at the scientific literature shows that the expression “psychological distress” is often applied to the undifferentiated combinations of symptoms ranging from depression and general anxiety symptoms to personality traits, functional disabilities and behavioural problems. The aim of this chapter is to provide a critical review of the clinical features, assessment and prevalence of psychological distress and of the empirical evidence on the risk and protective factors associated with psychological distress in the general population and in two specific populations. Workers and immigrants deserve special attention since they are exposed to specific risk and protective factors that may modify the impact of more general factors. This chapter will underline several issues that are central to a better understanding of the epidemiology of psychological distress and that need to be addressed in future research.

2. Clinical features of psychological distress

Psychological distress is largely defined as a state of emotional suffering characterized by symptoms of depression (e.g., lost interest; sadness; hopelessness) and anxiety (e.g., restlessness; feeling tense) (Mirowsky and Ross 2002). These symptoms may be tied in with somatic symptoms (e.g., insomnia; headaches; lack of energy) that are likely to vary across cultures (Kleinman 1991, Kirmayer 1989). Additional criteria have been used in the definition of psychological distress but these criteria do not make consensus. In particular, tenants of the stress-distress model posit that the defining features of psychological distress are the exposure to a stressful event that threatens the physical or mental health, the inability to cope effectively with this stressor and the emotional turmoil that results from this ineffective coping (Horwitz 2007, Ridner 2004). They argue that psychological distress vanishes when the stressor disappears or when an individual comes to cope effectively with

this stressor (Ridner 2004). There is plenty of evidence confirming the effect of stress on distress, however, including stress in the definition of distress fails to recognise the presence of distress in the absence of stress.

The status of psychological distress in the psychiatric nosology is ambiguous and has been debated at length in the scientific literature. On the one hand, psychological distress is viewed as an emotional disturbance that may impact on the social functioning and day-to-day living of individuals (Wheaton 2007). As such, it has been the object of numerous studies seeking to identify the risk and protective factors associated with it. On the other hand, distress is a diagnostic criterion for some psychiatric disorders (e.g., obsessive-compulsive disorders; post-traumatic stress disorder) and, together with impairment in daily living, a marker of the severity of symptoms in other disorders (e.g., major depression; generalized anxiety disorder) (Phillips 2009, Watson 2009). Thus, psychological distress would be a medical concern mostly when it is accompanied by other symptoms that, when added up, satisfy the diagnostic criteria for a psychiatric disorder. Otherwise, in line with the stress-distress model, it is viewed as a transient phenomenon consistent with a “normal” emotional reaction to a stressor. Horwitz (Horwitz 2007) illustrates this point by quoting a series of studies conducted among adolescents and showing the high fluctuation of depressive symptoms over intervals as short as one month. He argues that this fluctuation reflects the relatively brief sorrow that follows from failing a test, losing a sporting match or breaking up with a boyfriend or girlfriend. The transient nature of psychological distress has been disputed by Wheaton and his colleagues (Wheaton 2007) who have investigated the stability of psychological distress among adults based on seven longitudinal studies lasting from 1 to 10 years. They found that psychological distress was moderately stable and argued that this finding runs counter to the assertion that distress is a transient phenomenon. However, they could not account for the role of personality in this relative stability of psychological distress over time. In effect, neuroticism has been shown to be associated with psychological distress and some argue that it may partly account for chronic distress (Jorm and Duncan-Jones 1990).

Psychological distress is usually described as a non-specific mental health problem (Dohrenwend and Dohrenwend 1982). Yet, according to Wheaton (Wheaton 2007), this lack of specificity should be qualified since psychological distress is clearly characterized by depression and anxiety symptoms. In effect, the scales used to assess psychological distress, depression disorders and general anxiety disorder have several items in common. Thus, although psychological distress and these psychiatric disorders are distinct phenomena, they are not entirely independent of each other (Payton 2009). The relationship between distress and depression - and to a lesser extent, anxiety - raises the issue of whether psychological distress lays in the pathway to depression if left untreated (Horwitz 2007). Unfortunately, the course of psychological distress is largely unknown.

Finally, defining psychological distress as a normal emotional reaction to a stressor raises the issue of delineating “normality” in different populations and different situations. Indeed, it is widely agreed that the individual and collective experience of disease is partly bounded by cultural norms and that although negative states of mind such as feeling sad, depressed or anxious tend to be universal, the expression of these states of mind may vary in intensity and in form across and within societies (Kirmayer 1989, Kleinman 1991, Westermeyer and Janca 1997). This transcultural variation is especially noteworthy in somatic symptoms. According to Kirmayer et al. (Kirmayer 1989), “somatic symptoms provide the most common expression of psychological distress worldwide” but the type of somatic symptoms associated with distress may differ across cultures. For example, among Chinese, emotions are related to specific

organs and can cause physical damage to these organs: anger is associated with the liver, worry with the lungs and fear with the kidneys (Leung 1998). Haitians tend to view depression as a consequence of either a medical condition - usually anaemia or malnutrition - or worry. Thus, somatisation is related to mood disorder and it is expressed by feeling empty or heavy-headed, insomnia, fatigue or low energy, and poor appetite (Desrosiers and St Fleurose 2002). Similarly, in Arab culture, depression and somatisation are closely intertwined and depressive symptoms are expressed in physical terms, especially involving the chest and abdomen (Al-Krenawi and Graham 2000). Given the transcultural variation in the expression of distress, the transcultural validity of the scales used to assess psychological distress has been questioned. This point will be illustrated in the next section.

3. Assessment of psychological distress

Psychological distress is assessed with standardized scales that are either self-administered or administered by a research interviewer or a clinician. In principle, the development of a scale must be based on a comprehensive definition of the construct to be measured. As mentioned earlier, a major problem with the construct of psychological distress is its diversified meaning in the scientific literature. Indeed, several scales comprising a wide array of psychological, somatic and behavioral symptoms were developed without clear conceptual basis and are used to assess "psychological distress". In this chapter, the most widely accepted definition of psychological distress (i.e., "a state of emotional suffering characterized by symptoms of depression and anxiety") was adopted. In consequence, scales designed to measure an unspecified construct or a related construct such as depression or anxiety will not be discussed.

The development of a scale is a lengthy process. In short, it consists in four main steps. First, a set of items is selected from existing scales or formulated based on the definition of the construct under study and on the conceptual framework sustaining this construct in the targeted population. For instance, the assessment of the quality of life in adolescents and in seniors would require different conceptual frameworks because the main components of the quality of life in these two age groups differ considerably. Second, from the initial pool of items, a smaller set is identified based on the pattern of endorsement of these items in a representative sample of the targeted population. Third, this smaller set of items is submitted to several statistical analyses (e.g., factorial analysis; sensitivity and specificity analyses; receiver operating curve - ROC - analysis; test-retest analysis) to verify the validity and reliability of the scale. Fourth, a final version of the scale is constructed based on findings from the validation analyses. This process seems linear but, in effect, disappointing results at one step may require going back to preceding steps.

Two important issues must be stressed regarding the assessment of psychological distress. The first issue is the length of the time window used for the detection of distress symptoms. This time window ranges from the past 7 days to the past 30 days depending on the scale. The second issue is the cut-point used to discriminate individuals with a lower vs. higher level of distress. In most studies, psychological distress is analyzed as a continuous variable. However, the individual scores must be dichotomized to estimate the prevalence of distress and dichotomous scores are sometimes used as a solution to the notably asymmetrical distribution of the scores of psychological distress. Clearly, the length of the time window and the selection of the cut-point impact on the estimation of the prevalence of psychological distress and may also affect the identification of the less influential risk and

protective factors. In principle, the length of the time window and the cut-point are set in the course of the development of the scale. Now and then, different time windows and cut-points are applied for a specific scale. In particular, the modification of a cut-point may be legitimate when it is demonstrated that the initial cut-point lacks validity for the population under study.

Several scales satisfy the definition of psychological distress adopted here. A full description of these scales and of their psychometric characteristics is out of the scope of this chapter. Therefore, only the most validated and popular instruments will be discussed to give an overview of the way psychological distress is generally assessed. Three families of scales were chosen for discussion: (a) the General Health Questionnaire; (b) the Kessler scales; and (c) the scales derived from the Hopkins Symptom Checklist. These scales share several items in common.

3.1 The General Health Questionnaire (GHQ)

The GHQ was designed to assess psychological distress in population surveys and epidemiological studies, and to screen for non-psychotic mental disorders in clinical settings (Goldberg and Williams 1991). It initially contained 60 items describing depression, anxiety and somatic symptoms and social impairment. The GHQ now exists in four additional versions that differ by the number of items (12, 20, 28 and 30). The GHQ-28 is frequently used in clinical studies, whereas the GHQ-12 is the most popular version in epidemiological studies and population surveys. The GHQ-12 includes the following items: able to concentrate; lost sleep over worry; playing a useful part in society; capable of making decisions; constantly under strain; couldn't overcome difficulties; enjoy normal activities; face up to problems; unhappy and depressed; losing confidence in yourself; thinking of yourself as worthless; feeling reasonably happy. The inclusion of social impairment symptoms, especially in the longer versions, seems in contradiction with the prevalent definition of psychological distress. However, due to its widespread use and recognition as an indicator of distress, the GHQ is often considered as the Gold standard for the measurement of psychological distress (Furukawa et al. 2003).

The items use a 4-point severity/frequency scale (0-3) to rate the extent to which respondents have experienced each symptom over the past two weeks; the expressions "recently" and "during the last few weeks" are occasionally used instead of the two weeks reference period. The items scores can be added to create a total score of distress. An alternative scoring system uses a dichotomous scale (0-0-1-1) instead of the 4-point scale. The GHQ scales have been validated with clinical (Segopolo et al. 2009) and non-clinical samples (Nerdrum, Rustøen, and Rønnestad 2006). Validated versions of the GHQ exist in more than 40 languages (McDowell 2006) and the cross-cultural validity of these scales was established in some countries (Furukawa and Goldberg 1999, Goldberg, Oldehinkel, and Ormel 1998). The GHQ-12 was shown to be measurement invariant (i.e., to measure the same construct) across gender (Shevlin and Adamson 2005) and between adults and adolescents (French and Tait 2004). However, there is some evidence that, as a screening instrument, the GHQ-12 tends to underestimate the prevalence of affective disorders in women and overestimates it in men (Cleary, Bush, and Kessler 1987). Martin et al. (Martin and Newell 2005) and Shevlin et al. (Shevlin and Adamson 2005) have questioned the unidimensionality of the GHQ following factorial analyses indicating that the GHQ-12 has at least two dimensions. This multidimensionality would cast doubt on the use of the total

score of the GHQ-12 as a unidimensional index of psychological distress. However, a recent study based on confirmatory factor analysis suggests that the GHQ-12 is unidimensional and that the appearance of multidimensionality is due to a methodological artefact, i.e., a substantial degree of response bias for the negatively phrased items (Hankins 2008).

3.2 The Kessler scales

One of the most recent scale of psychological distress is the K10 (Kessler et al. 2002), a 10-item unidimensional scale specifically designed to assess psychological distress in population surveys. The K10 was designed with item response theory models to optimize its precision and sensitivity in the clinical range of distress, and to insure a consistent sensitivity across gender and age groups (Kessler et al. 2002). The scale evaluates how often respondents experienced anxio-depressive symptoms (e.g., nervousness, sadness, restlessness, hopelessness, worthlessness) over the last 30 days. Each item is scaled from 0 (none of the time) to 4 (all of the time) and the total score is used as an index of psychological distress. A 6-item version, called the K6, is also available. Since the K6 perform as well as the K10, Kessler et al. (Kessler et al. 2010) recommends the use of this shorter version.

Several studies showed no substantial bias for the K10 in relation to gender, education (Baillie 2005) or age (OConnor and Parslow 2010). The K6 also achieves an adequate level of measurement invariance across gender and age groups and over a 12-year period (Drapeau et al. 2010). The K6 was validated with teens (Green et al. 2010). The two Kessler scales were shown to outperform the GHQ-12 in detecting depressive and anxiety disorders in terms of overall ROC curve performance (95%CI of AUC being 0.89 to 0.91 for K10, 0.88 to 0.90 for the K6, and 0.78 to 0.82 for the GHQ) (Furukawa et al. 2003). In terms of dimensionality, most studies confirm the single-factor structure of the Kessler scales. Two studies provide some evidence for a two-factor structure for the K6 or a three- to four-factor structure for the K10 (Arnaud et al. 2010, Brooks, Beard, and Steel 2006). However, the very strong correlations between the factors in these studies still suggested considerable commonality between them. The inclusion of the K6 in the World Health Organization World Mental Health Survey Initiative has foster the translation and validation of this scale in 13 countries from the five continents (Furukawa et al. 2008, Kessler and Üstün 2008, Kessler et al. 2010). Additional validation studies have been conducted in Italy (Carra et al. 2011), Netherlands (Donker et al. 2010, Fassaert et al. 2009) and with Native Americans (Mitchell and Beals 2011). No substantial cultural bias has been identified so far.

3.3 The Symptom checklists

The Brief Symptom Inventory (BSI) (Derogatis and Melisaratos 1983, Derogatis 1993), the SCL-25 (Derogatis et al. 1974), the SCL-5 (Tambs and Moum 1993) and the more recent Brief Symptom Inventory-18 (Derogatis 2001) were all derived from the Hopkins Symptoms Checklist-58 items (HSCL-58) (Derogatis et al. 1974). The HSCL-58 contains a large array of symptoms but the BSI, the SCL-25 and the SCL-5 focus on anxio-depressive symptoms and somatic symptoms. The BSI contains 18 items that are rated on a 5-point scale (0 to 4). The scale focuses on the symptoms experienced during the last 7 days. The theoretical 3-factor structure of the BSI-18 is occasionally supported, but 1-factor and 4-factor structures have also been identified (Andreu et al. 2008, Prelow et al. 2005). The lack of stability of the factorial structure is problematic since it suggests problems of measurement invariance.

Effectively, studies of the BSI-18 conducted in the USA suggest that its factorial structure is different for Hispanic women vs. Afro-American or Caucasian women (Wiesner et al. 2010, Prelow et al. 2005). More specifically, the BSI-18 seems to have a 3-factor structure for Afro-American and Caucasian women and a 1-factor structure for Hispanic women. The official version of the BSI-18 exists only in English and few translations have been validated up to now.

The SCL-25 focuses on the symptoms experienced during the last 14 days and it is often used in studies conducted among immigrants (Hoffmann et al. 2006, Mollica et al. 1987, Rousseau and Drapeau 2004, Thapa and Hauff 2005). Many translations have been made and some have been validated (Strand et al.). The SCL-5 includes two anxiety items and three depression items. The correlation with the SCL-25 is quite high ($r=0.92$) and the performance of the SCL-5 to identify cases of serious mental disorder (in terms of sensitivity, specificity, predictive values and ROC curves) is almost as good as the that of the SCL-25 (Strand et al. 2003, Tambs and Moum 1993).

4. Prevalence of psychological distress

The prevalence of psychological distress is difficult to pinpoint due to the variety of the scales assessing distress, of the time windows used in the documentation of symptoms and of the cut-points applied to dichotomize the score of distress and identify individuals with pathological distress. It roughly ranges between 5% and 27% in the general population (Benzeval and Judge 2001, Chittleborough et al. 2011, Gispert et al. 2003, Kuriyama et al. 2009, Phongsavan et al. 2006) but it can reach higher levels in some segments of the population exposed to specific risk factors such as workers facing stressful work conditions and immigrants who must adapt to the host country while holding family responsibilities in the homeland. The International Labour Office stated that psychological distress affected between 15 and 20% of workers in Europe and North America (International Labour Office 2000) and one out of five workers may experience repeated episodes of psychological distress (Marchand, Demers, and Durand 2005a). The rate of the prevalence of psychological distress observed among immigrants ranges from 13% to 39% (Levecque, Lodewyckx, and Bracke 2009, Ritsner, Ponizovsky, and Ginath 1999, Sundquist et al. 2000).

Two characteristics of the prevalence of psychological distress are noteworthy: the widespread gender difference and the variation over the lifespan. The prevalence of psychological distress is higher in women than in men in most countries (Caron and Liu 2011, Jorm et al. 2005, Phongsavan et al. 2006) and in all age groups (Cairney and Krause 2005, Darcy and Siddique 1984, Myklestad, Roysamb, and Tambs 2011, Paul, Ayis, and Ebrahim 2006, Storksen et al. 2006, Walters, McDonough, and Strohschein 2002). Yet this gender difference is not universal. For instance, no gender difference was observed in Mexican Americans (Aranda et al. 2001), in African, Asian, Central American and South American immigrants in Norway (Thapa and Hauff 2005), in rural Australians (Kilkkinen et al. 2007) and in older Chinese (Chou 2007). The widespread gender difference points to three alternative hypotheses. The first hypothesis is that psychological distress may be partly attributable to gender-related personality traits or biological components, such as those found in depression and anxiety disorders (Parker and Hadzi-Pavlovic 2004). The second hypothesis is that, in most societies, women are more exposed or more vulnerable to the socio-cultural risk factors associated with psychological distress (Cleary and Mechanic 1983, Gove, Hughes, and Style 1983). Attempts to verify this hypothesis have produced mixed

findings. Women seem more responsive to stress emanating from their social network (Kessler and McLeod 1984) or their parental role (Umberson et al. 1996) and they tend to be more exposed to marital stress (Aranda et al. 2001, McDonough and Walters 2001), domestic stress (Evans and Steptoe 2002) and parental stress (McDonough and Walters 2001, Umberson et al. 1996). However, women and men tend to experience an equal level of distress when faced with the similar stress (Ensminger and Celentano 1990, Walters, McDonough, and Strohschein 2002). Ensminger et al. (Ensminger and Celentano 1990) found intriguing pattern of gender differences in distress regarding parental status. This gender difference was observed in single parents but not in individuals heading two-parent households. Ensminger et al. (Ensminger and Celentano 1990) conclude that gender difference in psychological distress is most likely related to role configuration rather than to intrinsic gender differences. Finally, the third hypothesis is that, in most cultures, the expression of emotions differs across gender. Some items of the scales used to assess psychological are indeed more frequently endorsed by women than by men but this difference in items functioning does not appear to account completely for the gender difference in psychological distress (Drapeau et al. 2010, Leach, Christensen, and Mackinnon 2008).

In general, the prevalence of psychological distress tends to decrease over the lifespan starting from late adolescence (Caron and Liu 2011, Gispert et al. 2003, Phongsavan et al. 2006, Walters, McDonough, and Strohschein 2002). The decreasing trend is more or less apparent depending on the age range covered by the studies and it is usually attributed to differential exposure to risk factors and to survival bias. There is some indication that the prevalence of psychological distress might follow a U-shaped distribution although the location of the peaks of this distribution is unclear. Schieman (Schieman, Van Gundy, and Taylor 2001) found that the prevalence of psychological distress peaks at 18-29 years old and 80-89 years old whereas Pevalin (Pevalin 2000) noted a curve rising up to middle age, declining to about 60 and rising again in both gender. Focusing on seniors, Paul et al. (Paul, Ayis, and Ebrahim 2006) and Cairney and Krause (Cairney and Krause 2005) noted an increase of the prevalence of psychological distress after 65 years old. Jorm (Jorm 2000) reviewed eight studies dealing with the distribution of distress over the lifespan and concluded that the evidence was inconsistent. He attributes this inconsistency to possible age biases in the measurement of distress, to the effect of neuroticism which tends to decrease with age, and to confounding by cohort effect.

5. Epidemiology of psychological distress

Empirical evidence on the epidemiology of psychological distress mostly rests on cross-sectional data collected in large scale population surveys and in studies focusing on specific segments of the population defined by age, gender, ethnicity or social roles. Longitudinal data are scarce. In principle, longitudinal data are especially useful to clarify the time sequence between psychological distress and putative risk and protective factors, and the combined evolution of these factors and distress over time. However, their usefulness decreases as the time interval between waves of data collection increases.

The objectives of a number of studies published in the scientific literature are essentially descriptive. These studies provide data on the distribution of psychological distress across socio-demographic categories of people and allow for the identification of groups at higher risk of distress. Other studies aims to verify hypotheses derived from theoretical frameworks. These studies serve to better understand the mechanisms underlying the

relationships between psychological distress and various factors. These theoretical frameworks typically stem from the stress-distress model and the role-identity model, which are complementary to a large extent. Stressors that occur outside of the context of specific roles (e.g., chronic health problems) are felt to impact on the psychological well-being only if they disrupt social roles. These point-of-views do not take into account the enduring stress related to disadvantaged life conditions such as poverty.

Pearlin (Pearlin 1989) posits that the stress process is embedded in three levels of social structure: social stratification (i.e., gender, age, socio-economic class, ethnicity), social institutions providing roles and statuses, and interpersonal relationships. Social structures determine the expression of distress, the exposure to specific stressors and the strategies used to cope with this stress. According to Pearlin, social roles entail five categories of strains: role overload (i.e., ineffective coping capacity vis-à-vis the demands inherent to a role); interpersonal conflicts within role sets (e.g., husband-wife); inter-role conflict (e.g., wife-mother-worker); role captivity (i.e., filling an unwanted role); and role restructuring within a role set (Pearlin 1989). According to Thoits, the saliency of specific social roles is central to the relationship between stress and distress in that stressful events or situations that threatens the role-identities most valued by an individual are more likely to impair his or her mental health (Thoits 1991). In her view, individuals who hold social roles and who perform adequately in those roles develop role-identities that contribute to their self-esteem by reinforcing their sense of who they are and of what is expected of them and by enhancing their sense of meaning and purpose in life. Thus the lack of social roles is a risk factor for psychological distress because it deprives individuals of a social identity. The role-identities theory has two main corollaries. First, the cultural value of specific social roles may vary across and within societies. Thoits (Thoits 1991) argues that, for instance in Western societies, the role of mother tends to be more salient than the role of father. Second, the accumulation of social roles should be protective since if one role fails to foster the self-esteem and the sense of meaning and purpose in individuals, the others can take over. Two hypotheses have been raised to explain why exposure to stress and coping strategies are likely to vary across the lifespan (Folkman et al. 1987). The developmental hypothesis contends that there are inherent changes in the ways people cope as they aged. The contextual hypothesis stipulates that age differences in coping are the result of changes in what people must cope with as they age.

A large number of risk and protective factors have been investigated in relation to psychological distress but the empirical evidence regarding the epidemiology of psychological distress ranges from convincing, to conflicting and questionable. The discrepancies between findings from different studies can sometimes be attributed to variation in the design of the studies (e.g., sample size; selection criteria; mode of data collection; assessment of psychological distress; type and measurements of other variables; statistical analysis). However, they may also reflect true epidemiological differences between groups or countries. Indeed, most studies have been carried out in Western countries and findings from these studies may not be readily generalized to countries with a different socio-cultural ideology or lower standards of living. The discrepancies between studies may also be attributable to selection and information biases. Selection biases may occur when non participation in a study and attrition are not random with regard to a factor related to the rationale underlying the study, for instance when highly distressed individuals are more likely to refuse to take part in a study or to drop out of a longitudinal

study. Information biases may arise when some categories of respondents fail to report their distress symptoms, maybe to comply with what they feel is socially desirable, and when the scale used to assess psychological distress lacks validity for the groups under study.

In this section, data on the epidemiology of psychological distress is presented in three parts. The first part reviews the empirical evidence pertaining to the general population, stressing - whenever possible - gender and age differences. The effect of some factors (e.g., poverty; social isolation; childhood trauma) is so powerful that it is felt over the lifespan. Other factors tend to have a more short-term effect or their effect varies considerably across life-stages. The second and third parts summarize findings pertaining respectively to workers and to immigrants.

5.1 In the general population

To summarize the empirical evidence on the epidemiology of psychological distress in the general population, risk and protective factor are split in three categories: (1) socio-demographic factors; (2) stress-related factors; and (4) personal resources. The *socio-demographic* factors regroups the characteristics of individuals that are inborn (e.g., gender; age; ethnicity) or that reflect the role of individuals in the social structure. These factors are the most common indicators of the populations at risk of psychological distress that could be targeted for prevention or intervention programs. The *stress* category covers the events and life conditions that exert a stress on the psychological well-being of individuals. The *social resources* category encompasses the resources that are available to individuals to prevent the occurrence of psychological distress. These three types of factors may be complementary. For instance, poverty is viewed as a stressful life condition whereas income is viewed as a personal resource.

Some factors are not considered in this summary of the epidemiology of distress either because the evidence is lacking or because they are usually interpreted in terms of social and economic factors that can be assessed more directly. Health behaviour such as smoking and alcohol intake are associated with increased odds and mean level of distress (Chittleborough et al. 2011, Kuriyama et al. 2009, , Myklestad, 2011 #718; Phongsavan et al. 2006) but the interpretation of this association is awkward. Smoking and alcohol may be a form of self-medication to dilute the burden of distress but they may also generate some distress. Few studies have explored the role of residential environment, which is usually described by opposing urban and rural areas. Findings are inconclusive and the rural-urban distinction is generally used as a proxy for economic disadvantage and for barriers to access to resources (Caron and Liu 2011, Myer et al. 2008).

5.1.1 Socio-demographic factors

A part from gender and age, which were discuss in the section on prevalence, ethnicity and social roles, especially the roles of worker and spouse are the main socio-demographic factors associated with variations in psychological distress. Ethnicity is viewed as a proxy for the cultural background of individuals. As a cultural marker, it is meant to account - albeit imperfectly - for the cultural norms, values and beliefs that influence the behaviour and attitude of people belonging to a specific ethnic group or country. Ethnicity may also signal membership in a minority that is stigmatized. The impacts of this ethnic stigmatisation include a loss of self-esteem and a lower access to the social resources that contribute to the health and psychological well-being of individuals, such as adequate

housing, income and employment. Discrimination has been shown to be a risk factor for psychological distress in several studies (Gonzalez-Castro and Ubillos 2011, Yip, Gee, and Takeuchi 2008). Findings from the study carried by Thapa and Hauff (Thapa and Hauff 2005) suggest that women and men may react differently to specific manifestations of discrimination: the mean level of distress was higher in men who were denied a job whereas it was higher in women who were denied housing. Thus it is not ethnicity per se that constitutes a risk factor but instead the socio-economic implications of membership in an ethnic minority.

The empirical evidence regarding ethnicity is conflicting. These conflicting findings may result from the way ethnicity and psychological distress are measured and analysed. For instance, two studies carried out in Australia have produced opposite results although both studies used the K10 to assess psychological distress among adults and applied a similar cut-point (i.e., ≥ 22). However, the measurement of ethnicity was different. Chittleborough et al. (Chittleborough et al. 2011) found that the odds of distress was higher in immigrants than in born Australians with the exception of immigrants from the United Kingdom (UK) whereas Phongsavan et al. (Phongsavan et al. 2006) found no significant difference between English speakers and non English speakers. Odds ratios were not altered by the addition of other variables in the studies. In all likelihood, English speakers would roughly equate with born Australians and immigrants from the UK whereas non English speakers would coincide with other immigrants. The measurement of membership into an ethnic minority through country of birth, self-reported ethnicity and language spoken at home may fail to capture the rationale underlying the concept of ethnic minority. Alternatively, members of some ethnic minorities may be more resilient than what is usually assumed. The transcultural validity of standardized scales has been questioned repeatedly but, as discussed previously, the most popular scales used to assess psychological distress (e.g., GHQ and K6 or K10) have shown their construct validity across various ethnic groups.

Bratter and Eschbach (Bratter and Eschbach 2005) have used data from the National Health Interview Survey conducted in the United States of America (USA) to investigate the association between ethnicity and psychological distress. The large sample size ($n = 162\,032$) recruited over the five cross-sectional annual waves (from 1997 to 2001) of the survey allowed them to stratify respondents in 10 self-reported "race/ethnic" groups. Only two ethnic minorities (Native Americans and Puerto Ricans) reported a higher mean level of psychological distress than "Whites". In the other minorities, the mean level was either lower than (Asian and Mexican) or similar to (African Americans, Cubans and other Hispanics) that of the mainstream population. The lack of statistically significant difference between Black and White Americans has been confirmed in other studies (Nemeroff, Midlarsky, and Meyer 2010). According to Bratter and Eschbach (Bratter and Eschbach 2005), these findings question the conceptual distinction between ethnic minorities and majorities in mental health studies and the assumption that membership in an ethnic minority is a risk marker for mental illness. They argue that although disadvantaged ethnic groups may be more exposed to the risk factors associated with psychological distress, they are not necessarily more vulnerable. In effect, individuals may belong to the ethnic majority and still be stigmatised because of their ethnic background (e.g., Black majority in South Africa; Myer et al. 2008).

Overall, the role of worker (Gispert et al. 2003, Phongsavan et al. 2006, Schieman, Van Gundy, and Taylor 2001, Walters, McDonough, and Strohschein 2002) act as a protective factor against psychological distress. According to Warr and Jackson (Warr and Jackson

1987), the role of worker fosters the psychological well-being not only because it is a valued social role but also because working provides financial resources and opportunities for control, skill use, socialisation and externally generated goals. Unemployed are viewed as a group at risk of psychological distress because they do not have access to these benefits although some work-related advantages (e.g., skill utilisation; socialisation) may be obtained outside the work environment. McKee-Ryan et al. (McKee-Ryan et al. 2005) carried out a meta-analysis to test the hypothesized influence of unemployment on psychological well-being. Psychological distress was one of the measures of mental illness used in the 52 selected studies. This meta-analysis confirmed that, in general, unemployment is a risk factor for mental illness though the detrimental effect of unemployment varies across categories of unemployed. Indeed, the motive for unemployment must be taken into account. Jorm et al., (Jorm et al. 2005) and Lincoln et al. (Lincoln et al. 2011) have found no overall significant difference in distress between unemployed and employed but a higher mean level of distress in individuals out of the labour market compared to employed individuals. Findings from the study conducted by Marchand et al. (Marchand, Drapeau, and Beaulieu-Prévost 2011) show that individuals unemployed because of family responsibilities report a mean level of distress similar to workers and lower than those without a job due to permanent or temporary disabilities and job seekers. In general, living with a spouse is also associated with a lower level of psychological distress (Caron and Liu 2011, Jorm et al. 2005) except perhaps in seniors (Cairney and Krause 2005, Paul, Ayis, and Ebrahim 2006, Prévile et al. 2002). However, although individuals who are divorced, separated or widowed tend to report a higher mean level of distress than those who are married, the mean level of distress is similar in never married and married (Walters, McDonough, and Strohschein 2002). At first glance, the lack of difference in married vs. singles may seem in contradiction with the finding that people living alone tend to report a higher mean level of psychological distress than those living with others (Paul, Ayis, and Ebrahim 2006, Phongsavan et al. 2006); but singles may live with friends and family. Finally, the influence of the role of parent on psychological distress is more controversial partly because the assessment of the parental role is intricate. For example, the number of children seems to act as a protective factor for the mental health of men but not of women (Jorm et al. 2005) whereas the age of the youngest child does not appear to affect psychological distress (Walters, McDonough, and Strohschein 2002).

5.1.2 Stress- related factors

In general, the empirical evidence supports the hypotheses derived from the stress-distress model: exposure to stressful events or life conditions tends to vary across social groups and the impact of the exposure to specific stressors on mental health is more or less severe depending on the resources available to cope with this stress among people belonging to these groups. Some studies focus on specific stresses consistent with the role-identify theory (e.g., life transition such as job loss, marital breakdown; family and work-related conflict) whereas others cover a wide range of stressors. In addition, most studies have targeted a specific age group such as adolescent, young adults, working age adults and seniors since, in agreement with the stress-distress model, exposure to different types of stress is likely to vary across the lifespan.

Murphy and Athanasou (Murphy and Athanasou 1999) conducted a meta-analysis on the effect of gaining or losing employment on mental health. Sixteen studies were identified and

the outcome measure of 11 of these studies was psychological distress. In all but two studies, job loss was associated with an increase in psychological distress. A number of alternative explanations may account for the increase in distress following job loss. The hypothesis that more distressed individuals were more likely to lose their job, was discarded by studies that control for the level of distress before the loss of employment. The hypothesis that those with a stressing or unsatisfying job would be less likely to experience an increase in distress following the loss of their job could not be verified in the studies selected by Murphy and Athanasou (Murphy and Athanasou 1999). The socio-economic context at the time of the job loss, the cultural meaning of the role of worker and the financial compensation following job loss were not investigated.

Jorm and his colleagues found several age and gender differences in the factors associated with psychological distress among Australian workers (Jorm et al. 2005). For instance exposure to stress tended to vary across the three age groups under study (20-24; 40-44; 60-64). More precisely, the probability of a recent end of a relationship, a recent problem with someone, and a recent job threat declined with increasing age. Childhood adversity, personal or family injury or illness, problem with someone, problem at work and conflicting relationship with friends or family were risk factors for psychological distress for both women and men. However, gender differences occurred in three types of stress: job insecurity was a risk factor for men but not for women whereas death in the family and end of a relationship were risk factors for women but not for men. These findings support the assumption that the role of worker is still more prominent for men than for women whereas family-related roles are more crucial for women than for men.

For seniors, chronic stress, recent life events and childhood trauma emerge as major risk factors for psychological distress (Cairney and Krause 2005). For adolescents, stress related to academic performance increases the odds of psychological distress (Darcy and Siddique 1984, Myklestad, Roysamb, and Tambs 2011, Ystgaard, Tambs, and Dalgard 1999) but there is some evidence that this type of stress may be more detrimental for girls than for boys. Thus the impression of failing in the role of students affects the psychological well-being of adolescents. Being bullied at school (Myklestad, Roysamb, and Tambs 2011) and family conflict (Wilkinson-Lee et al. 2011, Ystgaard, Tambs, and Dalgard 1999) increase the mean level of distress in both girls and boys although when detailed stressful situations are taken into account family conflicts seem to affect girls more than boys (Ystgaard, Tambs, and Dalgard 1999). Parental divorce seems to have a stronger effect in adolescent girls; time lapse since divorce does not appear to modify the association with distress (Størksen et al. 2006). Størksen et al. attributed the effect of divorce on distress to the enduring family conflicts following a divorce since divorce per se is quite common in Norway. In their opinion, parental divorce must be seen as a stressful situation instead of as a stressful event. Rickwood and d'Espaignet (Rickwood and d'Espaignet 1996) investigated the evolution of the prevalence of psychological distress from the age of 16 to 25 and found that for both women and men it reaches a peak at the final year at school and drops afterwards. Graduation from high school marks the end of adolescence and the beginning of adulthood for most youths living in industrialized countries (Gaudet 2007). From a psychosocial point of view, the transition from adolescence to early adulthood stands as a major life transition since, over a short period of time, high school graduates experience abrupt changes in their lifestyle and social identity and face new sources of stress, social network and social support that may foster or strain their psychological well-being (Creed, Muller, and Patton 2003, Needham 2007, Schulenberg, Sameroff, and Cicchetti 2004).

Poverty is associated with poor mental and physical health because it prevents people from purchasing adequate food, clothing and services, it affects self-esteem and the sense of control over one's life, it can be a cause of social exclusion and it can increase the likelihood of stressful events. Kessler (Kessler, Price, and Wortman 1985) defines two mechanisms explaining the relationship between socio-economic status and distress. Social selection posits that emotionally vulnerable individuals tend to drift to the lower socioeconomic strata of the society (i.e., distress causes SES drift) whereas social causation implies that economical hardship leads to distress by influencing the stresses to which one is exposed or the resources available to cope with stressful experiences (i.e., SES causes distress). He argues that: lower-class people might be highly exposed to the types of stressful experiences which can cause distress; and that they might be more likely to become distressed when exposed to these stresses. Lower income and socio-economic status have repeatedly been shown to be a risk factor for distress (Caron and Liu 2011, Myer et al. 2008, Phongsavan et al. 2006). Individuals with a low income tend to have a lower education, to be more frequently unemployed and to belong to ethnic minorities but the risk factors associated with psychological distress tend to be the same for low and higher income groups (Caron and Liu 2011). Thus people with a low income would not be more vulnerable to general risk factors but they would be more exposed to them. Benzeval and Judge (Benzeval and Judge 2001) have investigated the relationship between poverty and health over time in adults based on the British Household Panel Survey, a longitudinal population survey conducted every year between 1991 and 1997. They found that the odds of distress was higher in individuals whose current income was in the bottom 40% of the population income distribution whereas the five-year average income and the number of years below the average income or in the bottom fifth of the population distribution were not a risk factor for psychological distress. Thus there seems to be some sort of a ceiling effect to the detrimental effect of poverty. For adolescents, perceived poverty (Hamilton, Noh, and Adlaf 2009) may be more distressing than true financial difficulties as reported by parents (Myklestad, Roysamb, and Tambs 2011) although the latter may take more importance as adolescents move towards adulthood (Myklestad, Roysamb, and Tambs 2011). Sakurai et al. (Sakurai et al. 2010) have investigated three components of socio-economic status (SES) (i.e., subjective social status; education; income) in Japanese aged 20 to 74 years old. They found that low income increased the odds for distress for both women and men, that education did not affect the odds of distress for either gender and that women who felt that their social status was low were at higher risk of distress than those who felt that it was higher. In their opinion, the weaker (and not statistically significant) association of distress with education and income may reflect the fact that these indicators of socio-economic status are not as relevant to Japanese. Sakurai et al. (Sakurai et al. 2010) contend that the relationship between low income and distress in men but not in women reflects the Confucian gender role ideology where men are the sole bread-earners for their families. Perceived failure in this role may decrease men's self-esteem, causing greater distress.

In adults, chronic health problems and limitations in daily activities whether in self or in a close family member play an important role in the epidemiology of psychological distress (Gispert et al. 2003, Mandemakers and Monden 2010, Zabora et al. 2001). This association could be attributed to the diminished quality of life, the disruption of social roles, and the side effects of medication (Chittleborough et al. 2011). The detrimental impact of some chronic health problems may vary across the life span (Myklestad, Roysamb, and Tambs 2011), across gender (Gispert et al. 2003) and ethnic groups (Bratter and Eschbach 2005).

5.1.3 Personal resources

Personal resources may be split in two categories: inner resources and external resources. Inner resources encompass those resources that have a strong component of personality such as self-esteem and sense of control over one's life. These resources are relatively stable over the life span although they may be shattered temporarily or permanently in case of a traumatic event. High levels of self-esteem and sense of control over one's life are associated with lower mean level of psychological distress in adults (Gadalla 2009, Jorm et al. 2005, Walters, McDonough, and Strohschein 2002) and seniors (Cairney and Krause 2005). The sense of control over one's life tends buffer the effect of poor health and daily stress on distress but not the effect of poverty (Gadalla 2009). External resources include social network, social support, income and education.

In general, social support appears to be more essential to the psychological well-being of individuals than social network (Cairney and Krause 2005, Caron and Liu 2011, Gadalla 2009, Prévaille et al. 2002). In addition, there is some evidence that the type and source of support may act differently in women and men and across the lifespan. The study conducted by Kuriyama et al. (Kuriyama et al. 2009) in Japanese aged 40 and over illustrates the complexity of the relationship between the type of support and psychological distress. In this study, the odds of psychological distress were higher in women and men who lacked someone to provide advice when in trouble, and in women who had no one to consult about their health, to drive them to hospital and to take care of them. For adolescents, support from a group of friends is generally associated with a lower level of distress (Myklestad, Roysamb, and Tambs 2011, Ystgaard, Tambs, and Dalgard 1999). However, when friends at school and outside of school are distinguished, support from friends at school act as a protective factor for boys but not for girls and support from friends outside of school has no influence on psychological distress (Myklestad, Roysamb, and Tambs 2011). Operario et al. (Operario et al. 2006), found that high distress was associated with girls who reported low parental warmth and who turned to their peers for support during family conflict; boys were not affected by parental warmth or peers support. The type of social support and social network that are associated with distress in the adult population do not seem to have the same protective effect in seniors (Paul, Ayis, and Ebrahim 2006). Number of contact have no effect on psychological distress among seniors (Cairney and Krause 2005) whereas perceived social support, are associated with a decrease distress.

The protective effect of higher income and education against psychological distress has been confirmed in most studies for women and for men, for all age groups and across countries (Caron and Liu 2011, Chittleborough et al. 2011, Huang et al. 2009, Jorm et al. 2005, Nemeroff, Midlarsky, and Meyer 2010, Walters, McDonough, and Strohschein 2002). There is some evidence that education might interact in the relationships between psychological distress and income or disability. For example, the effect of education may be more protective for individuals with an average or higher income (Caron and Liu 2011). Education is assumed to buffer the effect of disability because more educated people may be better equipped (have better cognitive skills) to deal with the consequences of disability, such as disruption of social roles, increased difficulties in daily living, loss of income. However, although Mandemakers and Monden have shown that disability impacts more on the psychological distress of young adults with a low education than of better educated ones whatever the level of disability, they found that the better economic resources and cognitive abilities did not account for the interaction effect of education (Mandemakers and Monden 2010).

5.2 In workers

There is growing and convincing evidence that occupations and work organisation conditions affect the psychological well-being of workers. The investigation of work-related psychological distress rests on three main theoretical models. The Job Demand-Control Model (Karasek 1979) posits that work demands (i.e., workload; time constraints, pace of work; conflicting, emotional and physical demands) exert considerable stress on workers and that the level of decision latitude at work (i.e., high levels of skill utilization and decision authority) moderates the effect of this stress on the mental health of workers. The Demand-Control-Support Model (Karasek and Theorell 1990) expands on the Job Demand-Control Model by emphasizing the impact of social support in the workplace on the interaction between decision latitude and work demands. The Effort-Reward Imbalance Model (Siegrist 1996) underscores the importance of an equilibrium between demands and rewards (i.e., wage; social recognition; security; motivation; career perspective) in the experience of work-related stress and the onset and development of psychological distress. According to this model, an imbalance between demands and rewards is especially detrimental to the mental health of workers overcommitted to their job. Most empirical studies support the hypothesized influence of high work demands, low decision latitude, poor social support at work, and minimal rewards on the psychological distress observed in workers (Marchand, Demers, and Durand 2005b). However, the interaction between these factors have not been corroborated (Bonde 2008, Marchand and Durand 2011). The Job Demand-Control Model, Demand-Control-Support Model and Effort-Reward Imbalance Model have mostly been investigated in relationship with the type of occupations and work organisation condition.

5.2.1 Occupations

A number of longitudinal and cross-sectional studies worldwide have identified variations in psychological distress across occupations. Findings from these studies are difficult to compare because of differences in the classification of occupations. Data from a French study, the GAZEL cohort, showed that the mean level of psychological distress tends to be higher in semi-professionals (e.g., administrator; associate engineers), supervisors, office workers, blue-collar workers and craftsmen (Niedhammer et al. 1998). In the Netherlands, data from the Maastricht cohort study revealed that "occupation" explained 2.7% of the variance in psychological distress among workers (Bultmann et al. 2001). In this study, the prevalence of distress was higher for 10 out of the 131 occupations and the occupations at higher risk were mainly blue and white collar workers. Similarly, in Canadian studies conducted by Marchand and his colleagues, "occupation" accounted for 1% to 3% of the variance in psychological distress (Marchand, Demers, and Durand 2005b, 2005a, 2006). The Whitehall Study, which followed a large sample of London civil servants found that employees in higher grades or management positions were at lower risk of psychological distress than those lower in the hierarchy (Stansfeld et al. 2003). Similar results were obtained for the GAZEL cohort (Paterniti et al. 2002).

5.2.2 Work organisation conditions

Work organisation conditions seem more important than occupations per se to explain variations in psychological distress. Work organisation conditions can be defined around four organisational dimensions related to task design, demands, social relations and gratifications (Marchand, Demers, and Durand 2005a).

The nature and content of tasks vary across occupations and across organizations. Task can be more or less repetitive and make more or less use of an individual's skills and qualifications. The work organisation can also allow more or less control (i.e., autonomy, decision authority) to individuals in the performance of work-related tasks. Monotonous and repetitive jobs are associated with a higher risk of psychological distress (Johansson 1989, Shiron, Westman, and Melamed 1999) whereas skills utilization and control over the task completion are associated with lower risk of distress (Albertsen, Nielsen, and Borg 2001, Bourbonnais et al. 2005, Karasek and Theorell 1990). Altogether, the larger one's decision latitude is (i.e., high skill use and high decision authority), the lower the risk of distress in workers. However, findings from some studies suggest that too much skills utilization and decision authority can lead to more psychological distress (Marchand, Demers, and Durand 2005b, 2006). Organisational demands and personal involvement in the job yield to psychological and cognitive loads that can affect one's mental health. The stress generated by these demands is not necessarily negative since it may, within a certain limit, increase one's mastering and social identification at work. Nevertheless, beyond this limit, physical, psychological and contractual demands can foster psychological distress.

Physical demands take the form of several occupational health and safety risks manifest in the work environment (e.g., high levels of noise, dust, heat, cold, toxic vapours, neurotoxic substances) and the workplace can give rise to some risks of injuries and death. In addition, workers can be confronted to a high level of physical efforts (e.g., transporting heavy loads, uncomfortable work postures). Overall, physical demands are a risk factor for psychological distress (de Jonge, Mulder, and Nijhuis 1999, Marchand, Demers, and Durand 2005b). Similarly, psychological demands can generate elevated stress and increase the odds of psychological distress (Albertsen, Nielsen, and Borg 2001, Bourbonnais et al. 2005, Marchand, Demers, and Durand 2005b, Paterniti et al. 2002). Psychological demands are typified by task rhythm, workload, time constraints, and conflicting and emotional demands (e.g., client aggression, exposure to the suffering of others). Contractual demands are defined by unusual work schedules and number of working hours. Workers dealing with work schedules that are alternating, irregular or on night shift, experience a difficult situation. Shift work, being on call, and unpredictable work schedules require workers to adapt to variations in the circadian rhythm, which can promote sleep problems and diverse nervous reactions that can increase the feeling of distress. These types of work schedules can also lead to negative effects on family life and social isolation, which will further endanger the mental health of workers. All in all, work schedule and work hours increase the risk of psychological distress (Hayasaka et al. 2007, Hilton et al. 2008, Marchand, Demers, and Durand 2005b, Matthews, Power, and Stansfeld 2001, Sekine et al. 2006, Spurgeon, Harrington, and Cooper 1997).

Conflicting relationships at work, either with co-workers or supervisors, can create a stressful experience that may impact on the mental health of workers. In this vein, the social support received at work has been the subject of considerable attention and refers to social interactions providing instrumental and emotional support from colleagues and superiors. The social support at work fulfils the need of individuals to be acknowledged and endorsed in the execution of their task; it is a source of pleasure and compensation for the efforts invested at work. Studies using global scales of social support at work generally report lower levels of psychological distress when the social support is higher (Albertsen, Nielsen, and Borg 2001, Bourbonnais et al. 1998, Marchand, Demers, and Durand 2005a, 2006, McDonough 2000, Pomaki, Maes, and Ter Doest 2004). Social relations also encompass the

style of supervision. Some research suggests that the clarity and the consistency of instructions given by the supervisor is an important element in the reduction of psychological distress of white collar workers (Stansfeld et al. 1999). Abusive supervision (i.e., authoritarian and aggressive styles) brings about an elevated level of psychological distress in exposed workers (Tepper 2000). Finally problems with violence or harassment at work on the part of colleagues or supervisors are worthy of investigation, since several studies highlight the major impact of these problems on psychological distress (Marchand, Demers, and Durand 2005b, McDermut, Haaga, and Kirk 2000, Mueller, De Coster, and Estes 2001, Piotrkowski 1998, Richman et al. 1999). Finally, gratifications available in the workplace bring to the individuals an important source of recognition, motivation, valorisation, and of identification to their work. Thus a low level of gratifications can engender dissatisfaction and stress, which might affect mental health. These gratifications involve not only remuneration, but also career perspectives, job security and self-esteem at work. Some studies report a lower level of psychological distress in workers satisfied with the rewards obtained within their workplace (de Jonge et al. 2000, Demerouti et al. 2000, Tepper 2000). Conversely, several studies support the hypothesis that job insecurity and possibly the mode and the level of remuneration could in themselves be conducive to psychological distress (Bourbonnais et al. 1998, Ibrahim, Smith, and Muntaner 2009, Ikeda et al. 2009, Marchand, Demers, and Durand 2005a, 2006, McDonough 2000, Rugulies et al. 2006).

5.3 In immigrants

Resettling in an alien society entails a number of stressful experiences such as gaining employment, maintaining family cohesion within and across countries, recreating a social network and, sometimes, learning a new language. The level of stress generated by these experiences varies across categories of immigrants and is exacerbated by the cultural distance between the homeland and the host country and the lack of transferable skills (e.g., language, education, work experience). Immigrants may also have a hard time resettling if the host society is unable, because of a difficult socio-economic situation, or reluctant, because of inter-ethnic prejudices, to welcome strangers. Compared to other categories of immigrants, refugees may be disadvantaged because their exposure to political violence in their homeland or in refugees' camps may have weakened their physical and mental health. According to Silove (Silove 1999), exposure to political violence may harm a number of adaptive resources such as the feeling of safety, the capacity to form and nurture interpersonal bonds, the sense of identity and role functioning, the faith in justice, and the belief that life is meaningful and coherent. At first glance, immigrants and refugees would appear at higher risk of psychological distress than natives. However, this risk may be offset by the healthy migrant effect (Stafford, Newbold, and Ross 2011). In effect, immigrants form a selective group of individuals characterized by their determination to start a new - and hopefully better - life abroad and most countries select immigrants based on their health status and transferable skills. Similarly, healthier and better-educated refugees may be more likely to have survived the political violence in their home country and to have been selected for migration in refugees camp (Mollica et al. 2001).

Several factors affecting psychological distress in the general population also operate on the psychological distress of immigrants and refugees. In general, immigrant women report a higher mean level of distress than immigrant men (Gonzalez-Castro and Ubillos 2011, Lerner, Kertes, and Zilber 2005, Levecque, Lodewyckx, and Bracke 2009) although this

difference may not be statistically significant in older immigrants (Chou 2007, Ritsner, Ponizovsky, and Ginath 1999). Similarly, financial hardship (Gonzalez-Castro and Ubillos 2011, Lerner, Kertes, and Zilber 2005, Sundquist et al. 2000), poor self-reported health (Chou 2007, Lerner, Kertes, and Zilber 2005) and recent stressful events (Lerner, Kertes, and Zilber 2005, Thapa and Hauff 2005) act as risk factors whereas family cohesion (Lerner, Kertes, and Zilber 2005, Yip, Gee, and Takeuchi 2008) and the sense of control over one's life (Lerner, Kertes, and Zilber 2005, Sundquist et al. 2000) play a protective role.

The influence of other long-established risk and protective factors is more uncertain. Most studies have found no statistically significant effect of age (Levecque, Lodewyckx, and Bracke 2009, Thapa and Hauff 2005, Yip, Gee, and Takeuchi 2008) on the psychological distress of immigrants whereas the evidence is mixed for unemployment (Lerner, Kertes, and Zilber 2005, Levecque, Lodewyckx, and Bracke 2009, Thapa and Hauff 2005), education (Chou 2007, Levecque, Lodewyckx, and Bracke 2009, Sundquist et al. 2000) and marital status (Chou 2007, Lerner, Kertes, and Zilber 2005, Thapa and Hauff 2005).

Deciphering the relationships between psychological distress and factors typical of immigrants is a difficult task because of the complex interplay of the context of migration, the ethno-cultural background of immigrants and the socio-cultural characteristics of the host country. Bronstein and Montgomery conducted a systematic review of the literature related to the epidemiology of psychological distress in refugee children based on 22 studies (Bronstein and Montgomery 2011). They concluded that the mean level of psychological distress was high in these children and that it tended to vary by age, gender, country of origin, pre-migratory traumatic experience and post-migratory support. A similar exercise has not been conducted among adult refugees but some of the conclusions reached by Bronstein and Montgomery also apply to adults. For instance, Chou et al. (Chou 2007) recorded a higher mean level of distress in refugees to Australia than in individuals who had migrated to be reunited with their family or who were selected for immigration based on their professional skills whereas Thapa and Hauff (Thapa and Hauff 2005) observed no statistically significant difference between refugees and immigrants in Norway, and Rousseau and Drapeau (Rousseau and Drapeau 2004) found that the association between psychological distress and the context of migration to Quebec varied depending on the home country of immigrants. The effect of past exposure to political violence on the psychological distress of refugees in the host country is also ambiguous. Sundquist et al. (Sundquist et al. 2000) detected no significant effect in refugees from four different countries, Thapa and Hauff (Thapa and Hauff 2005) found a significant effect for women but not for men and Rousseau and Drapeau (Rousseau and Drapeau 2004) noted that the effect depended on the type of exposure to political violence and on the country of origin of refugees. Thus, at the population level, refugees are not systematically at higher risk of psychological distress than other immigrants.

Three main indicators have been used to assess the level of acculturation of immigrants: self-defined ethnic identity, mastery of the mainstream language and relationships with natives from the host country. Defining oneself as a member of the host country while preserving close ties with the culture of origin tends to act as a protective factor against psychological distress (Birman and Taylor-Ritzler 2007), perhaps more so for women than for men (Lerner, Kertes, and Zilber 2005). Sundquist et al. (Sundquist et al. 2000) found that a poor mastery of the mainstream language was a risk factor for men but not for women. Finally, Gonzalez-Castro et al. (Gonzalez-Castro and Ubillos 2011) and Thapa and Hauff (Thapa and Hauff 2005) have found no significant effect of social support provided by members of the mainstream population on psychological distress.

6. Conclusion

In the past few decades, empirical evidence has accumulated regarding the epidemiology of psychological distress. Still, the use of scales comprising a wide array of undifferentiated symptoms has impeded our understanding of the risk and protective factors that impact on psychological distress. Nevertheless, when restricting the review of the scientific literature on studies based on scales that assess psychological distress defined as *a state of emotional suffering characterized by symptoms of depression and anxiety* sometimes accompanied by somatic symptoms, several characteristic features emerge. First, in the general population, stressful events and life conditions and the lack of valued social roles come up as significant risk factors for psychological distress whereas inner resources (e.g., self-esteem) and external resources (e.g., income) are important protective factors. Second, among workers, high work demands, low decision latitude, poor social support at work, and minimal rewards increase the risk of psychological distress. Work-related factors do not explain all the variations in psychological distress observed in workers but the integration of the various elements that make up the social environment of workers (i.e., work, family, social networks, local community-neighbourhood) has proved difficult both theoretically and empirically. Finally, the prevalence of psychological distress is especially high among immigrants and refugees. Although several factors affecting the psychological well-being of the general population also impact on the level of psychological distress of immigrants and refugees, specific factors related to the context of migration and the resettlement process seem to take their toll on the mental health of these individuals. In all likelihood, factors associated with psychological distress also affect other dimensions of mental health and mental illness and there is a need to identify the similarities and differences between the epidemiology of psychological distress and other mental health problems.

The empirical evidence points to a number of issues that must be addressed to better understand, and eventually to prevent, psychological distress. Knowledge about the course of psychological distress is especially lacking and it prevents the distinction between transient and pathological distress. The gender and age differences in psychological distress remain largely unexplained although it has been the focus of several studies. Exposure to specific risk factors seems to vary across gender and across age group but the effect of this differential exposure on psychological distress is unclear. The complex interplay of socio-demographic factors, stress-related factors and individual resources also need to be further investigated. The relative contributions of occupation and work organization conditions and factors acting outside of the work environment have been largely unexplored. For instance, conceptual frameworks concerning work-related factors leave no room for the way gender and migration status could moderate the relationship between these factors and psychological distress. Still, the main brake to a better understanding of the epidemiology of psychological distress is the almost complete lack of systematic reviews of the empirical evidence concerning the numerous risk and protective factors associated with distress.

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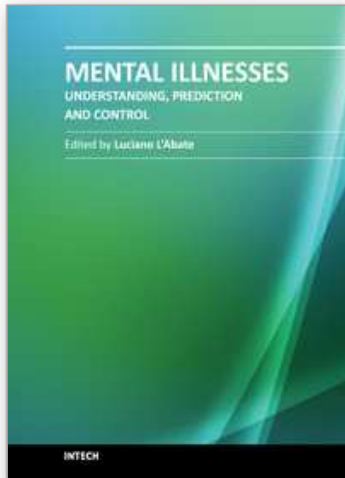
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In the book "Mental Illnesses - Understanding, Prediction and Control" attention is devoted to the many background factors that are present in understanding public attitudes, immigration, stigma, and competencies surrounding mental illness. Various etiological and pathogenic factors, starting with adhesion molecules at one level and ending with abuse and maltreatment in childhood and youth at another level that are related to mental illness, include personality disorders that sit between mental health and illness. If we really understand the nature of mental illness then we should be able to not only predict but perhaps even to control it irrespective of the type of mental illness in question but also the degree of severity of the illness in order to allow us to predict their long-term outcome and begin to reduce its influence and costs to society. How can we integrate theory, research evidence, and specific ways to deal with mental illness? An attempt will be made in the last conclusive chapter of this volume.

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