

A SIGHT OVER THE HEALTH OF WASTE PICKERS: AN ANALYTICAL FRAMEWORK PROPOSITION

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Introduction

Solid waste became one of the most concerning environmental issues nowadays, since their inappropriate management brings serious consequences to the environment, to population health and to the health of professionals who are directly involved with such matter, such as the case of waste pickers. These professionals, besides experiencing exclusion processes throughout life and in their work environment, are subjected to different risks due to chemical and biological contaminations, as well as to accidents caused by the precarious conditions faced by them during their picking activity.

Historically, waste pickers were in the core of the selective waste collection and in the Brazilian recycling industry, even before the enactment of *Política Nacional de Resíduos Sólidos* (PNRS) – National Solid Waste Policy -, which addresses them as essential actors in the selective waste collection process (SANTOS *et al.*, 2011; TEODOSIO *et al.*, 2016). After all, “recycling at high levels, and with social inclusion, is a feature of central countries. The recycling system demanding social inclusion has been subject and competence of peripheral territories” (TEODOSIO *et al.*, 2016, p. 32).

Despite the deficiencies in the infrastructure of Brazilian cities, the informal recycling chain often reinserts the recyclable material in production processes (GONÇALVES-DIAS, 2009; BURGOS, 2008). Actually, the work performed by waste pickers in the solid waste management (SWM) in Brazilian cities has been extremely important

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for urban cleaning systems, since it helps reducing the volume of waste, broadening products' life cycle, promoting social inclusion and generating new incomes to workers in the recycling chain (JACOBI; BESEN, 2006).

It is also worth highlighting that the waste picking activity was acknowledged as professional activity in 2002, when it was registered in the Brazilian Occupation Classification (n. 5192-05) under the title "Recycling material selection and collection workers". Based on this classification, waste pickers are

“(...) responsible for collecting recycling and reusable material, for selling the collected material, preparing the material to be shipped, performing environmental and equipment maintenance, outspreading the recycling work, managing the work and working with safety”.
(BRASIL, 2015).

However, not just the labor rights and income aspects must be the focus of actions taken by the public sphere, but also the health conditions and risks waste pickers are exposed to in the recycling chain (MANDELLI *et al.*, 2013). It must be done in order to have a more effective and efficient social inclusion, as it was proposed by the PNRS (BRASIL, 2010). After all, waste pickers face adverse conditions in their daily pickling activity, and such conditions are described in the general report by CBO (CRIVELLARI; DIAS; PENA, 2008). It happens because they work outdoor, at different times of the day, besides being exposed to many risks resulting from material handling, weather changes, traffic accidents and urban violence (BRASIL, 2015).

According to research conducted about the topic (CARDOZO; MOREIRA, 2015; GALON; MARZIALE, 2016), the conditions faced by waste pickers are poorly studied, and it highlights the need of intensifying the research focused on the difficulties waste pickers have to deal with during their labor activities. Thus, Mandelli *et al.* (2013) aimed at assessing waste pickers' understanding about their own health conditions. Accordingly, Gutberlet *et al.* (2016) also identified problems related to waste pickers' occupational health based on a research-action method, whereas Ferreira *et al.* (2016) focused on drawing the health profile and life-style of these professionals.

Accordingly, the present study aimed at answering the following question: What are the dimensions to be taken into account to analyze the health of waste pickers during their labor activities? In order to answer this question, the aim of the current research was to identify studies in the national and international literature focused on the health conditions of recycling material pickers and on their labor environment.

Decent work, a healthy life and human well-being are topics addressed by the 2030 Agenda for Sustainable Development Goals (SDG) and the targets to be reached in the coming years (ONU, 2015). Thus, the goal is to help improving the work and health conditions of waste pickers.

Besides this introduction, the article holds other five sections. The first one addresses issues related to waste pickers' working conditions. The methodology section describes the procedures adopted for the systematic literature review. The third one lists

the analyzed and classified articles based on four different analytical categories. Section four presents the dimensions to be taken into consideration, as well as their interrelations. Finally, the final considerations are highlighted.

Waste pickers' working conditions

Despite the important advancements accomplished by means of the PNRS, waste pickers still face exclusion processes throughout life, at work and in health systems due to the vulnerability resulting from their work and from the fragility of social services (BORGES; KEMP, 2008; GONÇALVES-DIAS, 2009). Thus, it is necessary paying attention to waste pickers' working conditions and to the organization of the existing recycling material cooperatives in Brazil, since these professionals are constantly exposed to risk situations in such locations (PORTO *et al.*, 2004).

Gouveia (2012, p. 1507) states that most waste pickers work "under unhealthy conditions, without any protection equipment, and that it results in high possibility of acquiring diseases". The same author says that the development of respiratory and musculoskeletal issues, and lesions due to accident, are among the problems related to activities performed by recycling material pickers. Moreover, they are exposed to infectious agents, to heavy metals and chemical substances.

Accordingly, based on the Regulating Standard n.15, from the Ministry of Labor and Employment (Ministério do Trabalho e Emprego - MTE), the work performed by waste pickers is one of the most unhealthy activities. Therefore, it demands the use of Individual Protection Equipment (IPE) and Collective Protection Equipment (CPE), as well as appropriate locations for the recycling activity (OLIVEIRA, 2011; SILVA, 2017).

Actually, the waste-picking activity is associated with many physicalⁱ, chemicalⁱⁱ, biologicalⁱⁱⁱ, ergonomic^{iv} and accidental risks (FERREIRA; ANJOS, 2001; PORTO *et al.*, 2004; GALON, MARZIALE, 2016). Briefly, the weight overload, as well as the forced and uncomfortable posture during the waste-picking activity can cause musculoskeletal damages to the spine (GALON, MARZIALE, 2016; MANDELLI, 2017). The contact with and inhalation of toxic products such as pesticides, bacteria and electronic components can cause allergies, infections, respiratory diseases, skin issues and intoxication (PORTO *et al.*, 2004; FERRON, 2010). Accidents can generate wounds caused by cutting materials such as glass, blades and needles; moreover, the contact with decaying materials, such as organic waste, can lead to severe contamination, since they bring fungi species to the picking locations (SOUZA, 2015). These professionals are also more prone to acquire health issues such as dermatitis, infections, verminoses and autoimmune diseases (FERREIRA; ANJOS, 2001).

Methodological procedures

This is an exploratory study based on the Systematic Literature Review (OKOLI; SCHABRAM, 2010). It was conducted in order to identify articles focused on waste pickers' health conditions. According to Okoli and Schabram (2010, p. 02), this review is

known as a stand-alone literature review, “whose sole purpose is to review the literature in a field, without any primary data (that is, new or original) collected or analyzed”. One of its main features lies on a review guided by strict systematic patterns based on eight different steps (OKOLI; SCHABRAM, 2010); briefly:

1. Purpose of literature review: identifying the expected end and aims;
2. Protocol and training: defining the protocol and parameters to be followed;
3. Searching for the literature: describing the literature-search details;
4. Practical screen: also known as inclusion analysis – choosing the articles and eliminating the ones that do not meet the review scope;
5. Quality appraisal: also known as exclusion analysis – assessing the articles based on the criteria set to check on their quality and adherence to the research aims;
6. Data extraction: systematically extracting data based on the topics relevant to the assessed article;
7. Synthesis of studies: also known as analysis – assessing the extracted data by using appropriate techniques, either qualitative or quantitative;
8. Writing the review: presenting the review in details and systematizing the research findings.

The following databases were checked: Scielo (*Scientific Electronic Library Online*), PubMed/Medline and LILACS (Latin American and Caribbean Health Sciences). The following inclusion criteria were established: the articles should focus on the health and work conditions of waste pickers and contribute to the best understanding of their labor environment. The used meshes in PubMed/Medline were “*waste pickers*” and “*health*”. Articles that were not in the review scope, such as editorials, conferences, posters, books and reviews were excluded from the study. The search for articles was performed in November 2015 and in September/October 2017 (Chart 1).

Chart 1 – Research Protocol Definition

Inclusion criteria	- Studies focused on recycling material pickers' health and labor conditions. - Articles contributing to the best understanding of the individual in his/her working environment.
Exclusion criteria	- Studies outside the research scope. - Editorials, conferences, posters, reviews and books
Keywords	- <i>Catadores</i> and <i>saúde</i> (Scielo and LILACS) - Waste pickers and Health (PubMed/Medline)
Database	Scielo, PubMed/ Medline and LILACS

Source: Prepared by the authors, 2017.

We found sixty-nine articles after the crossing in the databases, eight of them were excluded, because it was impossible accessing them. Twenty-eight out of the remaining

sixty-one articles were eliminated after their abstracts were read, since they were out of the research scope. Finally, the content of thirty-three articles (published between 2004 and 2017) was assessed.

Three charts were elaborated to analyze the articles. The first one presents the publications per year, the journal and the number of articles. The second shows data about the authors, research aim, journal, study site and work site. Finally, the third chart depicts the analytical categories based on specific information about the approached concepts on health. It was done in order to reach the study aims, i.e., identifying relevant information in the articles in order to develop an analytical framework.

Result presentation and discussion

The analysis of the publication year of the articles and about the journals showed no significant increase in the number of publications throughout time. *Ciência & Saúde Coletiva* was the journal publishing the largest number of studies meeting the scope of the current review. Most articles were published in Brazilian journals about health, the results comply with the herein studied topic. However, the fact that these studies almost do not show any interdisciplinarity calls the attention (Chart 2).

Chart 2 – Publication year, journal and number of articles (2004-2017)

JOURNAL	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	total
BMJ Open												1			1
Cadernos de Saúde Pública	1														1
Ciência & Saúde Coletiva						2		1		2					5
Escola Anna Nery Revista de Enfermagem													1		1
Revista Gaúcha de Enfermagem													1		1
International Journal of Environmental Health Research					1										1
Journal of Clinical Medicine Research												1			1
Journal of Community Health											1				1
Online Brazilian Journal of Nursing									1						1
PLoS One										1					1
Psicologia: teoria e prática									1						1
Revista de APS							1								1
Revista Brasileira Epidemiologia							1			1					2
Revista Brasileira de Enfermagem														1	1
Revista Brasileira de Saúde Ocupacional	1														1
Revista Eletrônica de Enfermagem									1						1
Revista Latino-Americana de Enfermagem				1											1
Revista Mal-Estar e Subjetividade				1		1									2
Revista de Nutrição										1					1
Revista Psicologia: Organizações e Trabalho			1												1
Revista de Saúde Pública					1				1						2
Revista de Terapia Ocupacional Universidade de São Paulo						1									1
Science of the Total Environment												1			1
Texto & Contexto - Enfermagem Revista													1		1
Zoonoses Public Health					1										1
Total	2	0	1	2	3	4	2	1	4	5	1	3	3	2	33

Source: Prepared by the authors based on data from Scielo, LILACS and PubMed/Medline, 2017.

The analysis of the articles allowed classifying them in four analytical categories: (1) waste, work and health meanings; (2) life, work and health conditions; (3) selection activity and (4) public and environmental health (Chart 3). Category 2 was the one encompassing most activities. Most articles addressed the Brazilian context of waste pickers, some of them were even published in international journals. It is important clarifying that the waste-picking phenomenon is mainly observed in Brazil and in developing countries.

Chart 3 – List of articles divided by analytical category

CATEGORY 1: WASTE, WORK AND HEALTH MEANINGS				
AUTHORS (YEAR)	AIM	JOURNAL	STUDY SITE	WORK SITE
Coeelho <i>et al.</i> (2016a)	Showing the acknowledgement of the activity and its meaning based on the perception of women waste-pickers	Texto & Contexto - Enfermagem Revista	RS, Brazil	Cooperative
Coeelho <i>et al.</i> (2017)	Describing the elements promoting satisfaction and dissatisfaction with the activity of the waste pickers	Revista Brasileira de Enfermagem	RS, Brazil	Cooperative
Pereira <i>et al.</i> (2012)	Describing the social representations of waste pickers about their daily work with garbage	Psicologia: teoria e prática	Niterói - RJ, Brazil	Landfill
Santos; Silva (2009)	Understanding how street sweepers and waste pickers perceive the relation between "dealing with garbage".	Revista Mal-Estar e Subjetividade	Fortaleza - CE, Brazil	-
Santos, Silva (2011)	Promoting a discussion about the meaning of garbage	Ciência & Saúde Coletiva	Fortaleza - CE, Brazil	Companies (street sweepers) and waste picker associations
CATEGORY 2: LIFE, WORK AND HEALTH CONDITIONS				
Porto <i>et al.</i> (2004)	Investigating the life, work and health conditions	Cadernos de Saúde Pública	Rio de Janeiro - RJ, Brazil	Landfill
Sousa; Mendes (2006)	Testing an investigation methodology on the relation between health and work in the waste-picking activity	Revista Psicologia: Organizações e Trabalho	DF, Brazil	Cooperative
Cavalcante; Franco (2007)	Describing the work routine and presenting the reports about coping with the associated risks and the defense strategies adopted by waste pickers	Revista Mal-Estar e Subjetividade	Fortaleza -CE, Brazil	Dumping ground
Dall'Agnol; Fernandes (2007)	Knowing the self-preservation behavior of workers in this cooperative	Revista Latino-Americana de Enfermagem	Porto Alegre - RS, Brazil	Cooperative
Alvarado-Esquivel <i>et al.</i> (2008)	Determining the prevalence of infections caused by <i>T. gondii</i> in two populations exposed to municipal solid waste.	Zoonoses Public Health	Durango, México	Municipal transference station
Gutberlet; Baeder (2008)	Discussing the results about the occupational health risks of informal recyclers	International Journal of Environmental Health Research	Santo André - SP, Brazil	Street
Rozman <i>et al.</i> (2008)	Estimating the serum-prevalence of HIV, B and C hepatitis and syphilis.	Revista de Saúde Pública	Santos - SP, Brazil	Street
Almeida JR <i>et al.</i> (2009)	Analyzing the age effects on the quality of life and health of waste pickers	Ciência & Saúde Coletiva	Governador Valadares - MG, Brazil	Association
Alencar; Cardoso; Antunes (2009)	Investigating the work conditions of recycling material pickers	Revista de Terapia Ocupacional University of Sao Paulo	Curitiba - PR, Brazil	"Collection institutions"
Rozman <i>et al.</i> (2010)	Estimating anemia prevalence and analyzing the risk factors associated with it.	Revista Brasileira Epidemiologia	Santos - SP, Brazil	Street
Ballesteros; Arango and Urrego (2012)	Characterizing the occupational work, health and risk conditions of environmental receptors	Revista de Saúde Pública	Medellin, Colombia	Organizers/autonomous
Jesus <i>et al.</i> (2012)	Assessing the perception of recycling material pickers about quality of life	Revista Eletrônica de Enfermagem	MG, Brazil	Street/Free markets/Deposits
Santos <i>et al.</i> (2012)	Assessing spirituality in the quality of life of waste pickers	Online Brazilian Journal of Nursing	MG, Brazil	Street/Free markets/Deposits
Alvarado-Esquivel (2013)	Determining the serum-prevalence of infections caused by <i>Toxocara</i> in waste pickers	PLoS One	Durango, Mexico	Municipal transference stations
Castilhos Junior <i>et al.</i> (2013)	Characterizing the profile, diagnosing the working conditions and identifying the physical and operational structure of waste picking organizations	Ciência & Saúde Coletiva	South, Southwest and Northeast Brazil	Cooperative/Association
Hoefel <i>et al.</i> (2013)	Analyzing the work environment and life conditions in order to understand the relations between the health and disease process	Revista Brasileira Epidemiologia	DF, Brazil	Dumping ground
Santos <i>et al.</i> (2013)	Estimating the prevalence of intake unsafety and of social vulnerability and health risk factors	Revista de Nutrição	Brasília - DF, Brazil	Dumping ground
Veloso; Guimarães (2013)	Exploring the use of images as methodological instrument in health quality research	Ciência & Saúde Coletiva	Porto Alegre - RS, Brazil	Cooperative/Comlurb
Auler; Nakashima; Cuman (2014)	Analyzing the health conditions of waste pickers and their access to public health services	Journal of Community Health	PR, Brazil	Cooperative
Alvarado-Esquivel <i>et al.</i> (2015)	Determining the association of <i>Leptospira IgG</i> serum-prevalence with the waste-picking activity	Journal of Clinical Medicine Research	Durango, Mexico	Undeclared
Shibata <i>et al.</i> (2015)	Assessing the life and work conditions of waste pickers and of their children	Science of the Total Environment	Makassar, Indonesia	landfill
Singh; Chokhandre (2015)	Assessing the prevalence of musculoskeletal disorders in waste pickers	BMJ Open	Mumbai, India	Dumping ground
Coeelho <i>et al.</i> (2016b)	Understanding the risk of getting sick due to work and the defensive strategies adopted by recycling material picker women	Escola Anna Nery Revista de Enfermagem	RS, Brazil	Cooperative
Coeelho <i>et al.</i> (2016c)	Knowing the elements related to the life, work and health conditions of waste picker women	Revista Gaúcha de Enfermagem	RS, Brazil	Cooperative
Araújo; Sato (2017)	Describing the work capacity and health issues of Brazilian waste pickers	Journal of Community Health	SP, Brazil	Cooperative
CATEGORY 3: SELECTION ACTIVITY				
Cockell <i>et al.</i> (2004)	Analyzing the selection sector of a cooperative	Revista Brasileira de Saúde Ocupacional	São Carlos - SP, Brazil	Cooperative
CATEGORY 4: PUBLIC AND ENVIRONMENTAL HEALTH				
Siqueira; Moraes (2009)	Approaching the environmental issues resulting from the population and from the generation of solid waste, with emphasis to health and environment concepts as social representativeness	Ciência & Saúde Coletiva	Does not apply	Does not apply
Lermen; Fisher (2010)	Identifying how populations in the most vulnerable areas notice and interact with their environments	Revista de APS	Porto Alegre - RS, Brazil	Community

Source: Prepared by the authors based on data from Scielo, LILACS and PubMed/Medline, 2017.

Santos and Silva (2011) address the meaning of ‘garbage’ and ‘health’, as well as point out the importance of meanings to understand the individual in its working environment and, consequently, to improve waste pickers’ work and health conditions listed in the “waste, work and health meanings” analytical category. Accordingly, Santos and Silva (2009), Pereira *et al.* (2012) and Coelho *et al.* (2016a) highlighted the complexity and ambiguity of working with waste and the dialectical process of inclusion (work and income source, activity acknowledgment, “warrior women” and “men-women” self-image) and exclusion (prejudice, negative self-image built from the stigma of working as the “rest”, suffering) this activity represents for these professionals. Thus, according to these groups of workers, working with waste “gives other subjective and odd meaning to independence, overcoming, resistance and to the possibility of improving the quality of life” (COELHO *et al.*, 2016a, p. 8). Moreover, this work can, at the same time, bring satisfaction and dissatisfaction experiences (COELHO *et al.*, 2017).

According to waste pickers, waste is a source of life maintenance – livelihood and survival (PORTO *et al.*, 2004; SANTOS; SILVA, 2011). Assumingly, waste pickers perceive the risk of their work, but they do not relate such risks to health issues and do not associate diseases with the fact of working with waste (PORTO *et al.*, 2004); or they just do not give the proper attention to the matter (CAVALCANTE; FRANCO, 2007; COELHO *et al.*, 2016c; SOUSA, MENDES, 2006). Waste pickers understand health as the capacity to work (PORTO *et al.*, 2004), so they believe that they do not get sick (PEREIRA *et al.*, 2012) and, as a contrast, they are afraid of getting severe and incurable diseases (SANTOS, SILVA, 2011).

Some relevant items in the “Life, work and health condition” analytical category contribute to help better understanding the herein assessed matters. The first of them corroborates the idea that the precarious working conditions waste pickers live in are characterized by high socio-environmental vulnerability (ALENCAR; CARDOSO; ANTUNES, 2009; BALLESTEROS; ARANGO E URREGO, 2012; COELHO *et al.*, 2016b; COELHO *et al.*, 2016c; SOUSA, MENDES, 2006). Moreover, such environment favors the occurrence of labor accidents (CAVALCANTE; FRANCO, 2007; COELHO *et al.*, 2016c; SHIBATA *et al.*, 2015) and of physical and mental diseases (ALENCAR; CARDOSO; ANTUNES, 2009; COELHO *et al.*, 2016b; ALVARADO-ESQUIVEL *et al.*, 2008; ALVARADO-ESQUIVEL, 2013; ARAÚJO; SATO, 2017; GUTBERLET; BADER, 2008; ROZMAN *et al.*, 2008; SHIBATA *et al.*, 2015; SINGH; CHOKHANDRE, 2015) capable of impairing their quality of life and health promotion.

The selected articles evidenced waste pickers’ low adhesion to individual protection equipment use, although they also showed the inappropriate use of materials found among the collected waste. However, these materials do not protect waste pickers from risks inherent to the waste-picking activity (ALENCAR; CARDOSO; ANTUNES, 2009; BALLESTEROS; ARANGO E URREGO, 2012; PEREIRA *et al.*, 2012; SANTOS, SILVA, 2009; SHIBATA *et al.*, 2015; SOUSA, MENDES, 2006). Hoefel *et al.* (2013) point out that such refusal results from their complaint about the discomfort of picking with gloves; despite the risks, waste pickers rather do not wear gloves, since productivity is a relevant factor for them.

Other relevant aspects recorded by Rozman *et al.* (2010) concern gender, picking time and eating habits, which are factors influencing the number of anemia cases. Thus, appropriate eating, i.e., eating and nutrition safety (SANTOS *et al.*, 2013), is an important criterion to be taken into consideration. On their turn, Hoefel *et al.* (2013) addressed that the work and fellowship relationships are important to decrease the number of labor accidents. “It is possible observing that the broader perception about fellowship among waste pickers decreases the number of labor accidents” (HOEFEL *et al.*, 2013, p. 778). However, interpersonal issues in the labor environments waste pickers work in do not cease to exist (COELHO *et al.* 2016b; COELHO *et al.*, 2017).

It is also important taking a close look over the herein used methodological procedures, mainly when the aim is to understand reality based on the waste pickers’ viewpoint. According to the waste picking context, the adoption of “participative methodologies based on research-action” (TEODÓSIO; GONÇALVES-DIAS; SANTOS, 2014, p. 264) seem to be essential to make the dialogue between researchers and waste pickers effective. The “focal group” approach used by Dall’Agnol and Fernandes (2007) to collect data during discussion sessions, the use of snow ball^v to gather samples, the use of content analysis to treat data and the emergence of topics can work as reference for future studies. The use of image would also be a methodological instrument to understand the work and environment of waste pickers (LERMEN; FISHER, 2010; VELLOSO; GUIMARÃES, 2013).

With regard to the analytical category “Selection activity”, Cockell *et al.* (2004) used the Ergonomics Activity Analysis (EAA) methodological approach, in which the observation focus lies on the performed work rather than on the prescribed one. Moreover, it parts from the assumption that activities cannot be reduced to what is actually observed, but they must take into account the informal knowledge, the criteria of individuals that guide their actions and goals, which, in their turn, can be conflicting with the organization. Therefore, this methodology takes into consideration the work activity, its conditions and results. Accordingly, the aim of such approach is to provide a global view of the individual in order to positively transform his/her work.

Based on the “Public and environmental health conditions” analytical category, Siqueira and Moraes (2009) stated that solid waste is a public health issue in which health conditions derive from life and environmental conditions. Therefore, they introduced the concept of environmental health, which is a public health field focused on the interrelation between health and environment. These authors pinpointed that environment is different from nature, and that it is related to persons’ interaction (society and culture) and to their environment (physical and biological). Thus, it is possible seeing that the understanding of health is much broader than the diseases, since they cover aspects related to life-style and environmental conditions.

In their turn, Lermen and Fisher (2010) presented the relation between waste pickers and the environment they live in, as well as their perception about the impact waste can have on the environment and on public health. One of the findings from this study lies on schooling, which is a relevant factor to be closely analyzed in order to allow a critical sight over these matters.

The suggested analytical framework: building the analysis dimensions

The thirty-three assessed articles were framed in an analytical category chart. The first category addresses the subjectivity of the individual in relation to waste, work and health; therefore, it takes into account that meanings are the essence of the category. The second category raises aspects related to waste pickers themselves, so it takes into consideration that such category focuses on the individual. The third one addresses the aspects of activities performed by these professionals; therefore, this category focuses on the activity itself. The last category approaches broader aspects related to environmental issues and to their relation to health. Thus, it is possible inferring that the environment is the basis substantiating the category. Based on such analysis, the analytical categories were grouped in the following dimensions: meaning, individual, activity and environment (Chart 4), in order to generate an analytical framework opened to operationalization.

Chart 4 – Suggested analytical frame

DIMENSION	ANALYTICAL CATEGORY
Meanings	Category 1- waste, work and health meanings
	- Work, waste, health, risk and protection.
Individual	Category 2 – Life, work and health conditions
	- Eating habits, diseases (biological, physical and emotional aspects).
	- Contamination, accidents (labor safety aspects).
	- Life conditions (socio-demographic aspects such as sex, age, income, waste-picking time). - work relations.
Activity	Category 3 – Selection activity
	- Objective aspects: organization (work organization aspects), conditions (space, equipment/machinery, physical and intellectual demands) and results. - Subjective aspects: informal knowledge, criteria that guide the actions and the conflicting goals.
Environment	Category 4 – Public and environmental health
	- Life conditions: housing, access to basic sanitation systems, schooling and leisure. - Work conditions: unsafety and danger.

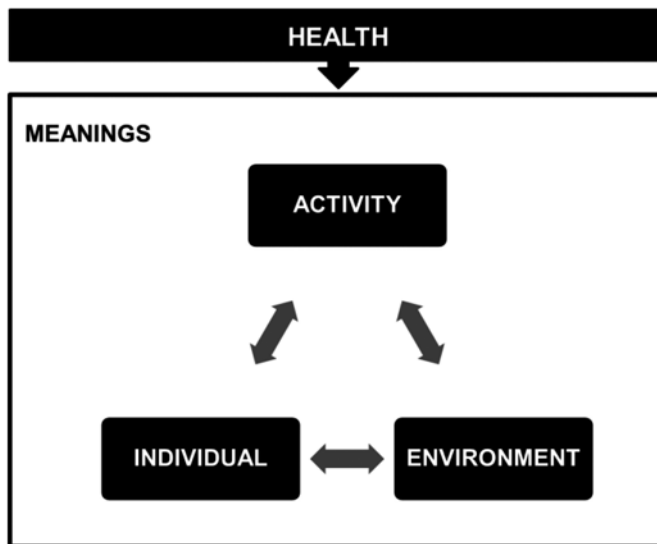
Source: Prepared by the authors based on data from Scielo, LILACS and PubMed/Medline, 2017.

The dimension of meanings covers all other dimensions and must be the starting point in order to help better understanding the reality experienced by waste pickers. Concepts generated in the academic universe are not easy to be understood by people who are not scholars. Moreover, the understanding about the complex and ambiguous reality experienced by waste pickers is possible when one enters the universe of meanings given to work, waste and health; therefore, transformation demands dialogue and balances the understanding.

With regard to the dimension of the individual, a broader view of the eating habits, life conditions (gender, age, income and waste-picking time) and the work relations must balance its understanding, rather than just observing the work diseases and accidents. When it comes to the activity dimension, it is necessary taking into account the objective and subjective aspects related to the activity itself, because such aspects result from the individual him/herself. Finally, not only the context surrounding the work environment is relevant for the environment dimension, but also the questions related to housing, to access to sewage, to the activities performed in times off and to education.

Interrelations between these dimensions are essential to help understanding the health of waste pickers. The dimension of meanings stays between all other dimensions and works as the background substantiating the other ones. The other dimensions are intrinsically related to each other and their separation is a heuristic resource of representation (Figure 1).

Figure 1 – Interrelations between health dimensions and the work with recycling material



Source: Prepared by the authors, 2017.

Therefore, each one of the articles raised relevant aspects for the development of an analytical framework whose purpose is to take into consideration the individual and his/her environment, as well as to help deeply understanding the elements concerning waste pickers' health conditions. Briefly, what has been initially addressed is the understanding about the meanings individuals give to the herein approached concepts. Subsequently, work activity and process need to be assessed based on their relation to the individual and to his/her environment.

Final considerations

Waste pickers are essential actors in the solid waste management in the selective waste collection and recycling chain or even as environmental educators. However, it is not possible to forget that waste-picking is an intrinsically dangerous and unsafe activity, since it deals with materials capable of posing physical and biological risks either to the occupational health of these professionals or to the environmental health. Although it stands out for being an intense activity that demands a lot of effort, its financial profit is extremely low.

The stability and continuity of public policies supporting and fomenting the waste-picking activity are essential; therefore, they demand financial resources to the purchase of equipment, machinery and trucks, as well as an appropriate environment for the selection and storage of the received material in order to improve productivity, work and income conditions.

Improving cooperative conditions through the supply of equipment, machinery and appropriate spaces for the waste-picking activity is necessary in order to enhance the work and life conditions, and consequently, the health of this set of workers. The following reports were frequent in the selected articles: accidents, diseases, refusal to wear individual protection equipment (IPE), pain; and precarious life, work and environmental conditions.

The answer to the research question poses great challenges to researchers, managers and technicians in public bureaus, since it demands a broader look over the meanings, the individual, the activity and the environment. Thus, the suggested dimensions must be analyzed in order to develop a broader view of waste pickers' health conditions.

With regard to further studies, it is recommended to perform empirical studies to validate the suggested structure. Moreover, it is relevant to promote educational campaigns focused on the population in order to achieve the proper waste separation, the development of IPEs and of machinery specific to fulfill the specificities of the activity performed by waste pickers. It is necessary to accomplish more advancements in this field by broadening the discussion in order to improve the life conditions of thousands of workers living on waste-picking. Finally, we expect the present study to boost discussions about solid waste by supporting public policies to encourage the participation of cooperatives and to minimize the risks for waste pickers' health conditions.

Notes

- i Physical risks are those resulting from productive processes and equipment, namely: noise, vibrations, abnormal atmospheric pressure, extreme temperatures (high and low), ionizing and non-ionizing radiation (BRASIL, 1978b).
- ii Chemical risks are those deriving from the handling and processing of raw materials: dust, smoke, fog, mist, gases and steam, stand out among them (BRASIL, 1978b).
- iii Biological risks are those resulting from the handling, transformation and modification of microscopic living beings such as genes, bacteria, fungi, bacilli, parasites, protozoa, viruses, among others (BRASIL, 1978b).
- iv Ergonomic risks are related to psychological and physiological factors that cause dysfunctions between the individual and his/her work station.
- v Sampling technique also called "snow ball", in which some individual names another to be part of the research group (CRESWELL, 2014; DALLAGNOL; FERNANDES, 2007).

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Feature Topics

A SIGHT OVER THE HEALTH OF WASTE PICKERS: AN ANALYTICAL FRAMEWORK PROPOSITION

Abstract: This study aims to identify articles focused on the waste picker's health to support the construction of an analytical framework that considers the individual and the environment in the scope of their labor activity. For this purpose, it is intended to answer the following question: which aspects can be considered in the analysis of the waste picker's health in their labor activity? Methodologically, it has an exploratory nature and use the Systematic Review of Literature. The results pointed out to four categories of analysis grouped into the following aspects: meanings, individual, activity and environment. The analytical framework proposed presents contributions for an extended understanding of waste picker's health, its aspects and interrelationships. Finally, it is suggested that empirical studies could be carried out to validate the proposed structure.

Keywords: Waste pickers. Health. Solid waste. Environmental risks. Occupational risks.

Resumo: Este estudo tem como objetivo identificar artigos cujo foco seja a saúde do catador de material reciclável, a fim de subsidiar a construção de um quadro de análise que considere o sujeito e seu ambiente no âmbito de sua atividade laboral. Para tanto, propõe-se responder à pergunta: Quais dimensões podem ser consideradas na análise da saúde do catador de material reciclável em sua atividade laboral? O estudo tem natureza exploratória e utilizou como procedimento metodológico a Revisão Sistemática da Literatura. Os resultados apontaram para quatro categorias de análise, agrupadas nas seguintes dimensões: significados, indivíduo, atividade e ambiente. O quadro analítico proposto contribui para o entendimento ampliado sobre a saúde do catador, suas dimensões e inter-relações. Por fim, sugere-se a realização de estudos empíricos para validação da estrutura proposta.

Palavras-chave: Catadores de materiais recicláveis. Saúde. Resíduos sólidos. Riscos ambientais. Riscos ocupacionais.

Resumen: Este estudio tiene como objetivo identificar artículos que tengan como principal foco la salud de los recicladores para subsidiar la construcción de un cuadro analítico que considere el sujeto y el ambiente tanto en el ámbito de su actividad laboral. Para este fin, se propone dar respuesta a la pregunta: ¿Cuáles dimensiones pueden ser consideradas en el análisis de la salud del reciclador en su actividad laboral? El estudio es de carácter exploratorio y utilizó como procedimiento metodológico una Revisión Sistemática de la Literatura. Los resultados generaron cuatro categorías agrupadas en las siguientes

dimensiones: significados, individuo, actividad y ambiente. El cuadro analítico propuesto trae contribuciones para un entendimiento ampliado sobre la salud del reciclador, sus dimensiones y sus interrelaciones. Por último, se sugiere la realización de estudios empíricos para la validación de la estructura propuesta.

Palabras clave: Recicladores. Salud. Residuos sólidos. Riesgos ambientales. Riesgos ocupacionales.
