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Financial Toxicity in Patients with Lung Cancer: A Scoping Review Protocol

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Manuscripts

Financial Toxicity in Patients with Lung Cancer: A Scoping Review Protocol

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ABSTRACT

Introduction Lung cancer has the second-ranked morbidity rate and the first-ranked mortality rate worldwide. With the progression of the cancer condition and the advance of new treatments, the corresponding medical expenses have risen sharply. Nowadays, financial toxicity has become one of the most common concerns in cancer patients. However, the full landscape of studies on financial toxicity is unclear in lung cancer patients by far. Thus, this scoping review aims to summary the degree, affecting factors, outcomes and intervention strategies of financial toxicity in patients with lung cancer.

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4 **Methods and analysis** This scoping review will be developed following
5
6 the methodology described in the JBI Manual for Evidence Synthesis on
7
8 scoping review protocol, which was based on Arksey and O'Malley's
9
10 methodological framework, Levac et al's recommendations for applying
11
12 this framework and Peters' enhancements of the framework. From the
13
14 day of database building to December 31, 2021, nine English databases
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16 will be searched in "Abstract" field with three parts of search terms
17
18 "Lung", "Cancer" and "Financial toxicity". The studies screening and
19
20 data extraction will be independently performed by two reviewers. Any
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22 disagreements between the two reviewers will be resolved by consensus,
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24 and a third reviewer will be invited if necessary. The results will be
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26 analyzed and presented using tables and figure. This scoping review will
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28 be reported following the Preferred Reporting Items for Systematic
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30 Reviews and Meta-Analyses extension for Scoping Reviews checklist
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32 (PRISMA-ScR).
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43 **Ethics and dissemination** An ethical approval is not required for this
44
45 scoping review protocol, nor for the scoping review. The results of this
46
47 scoping review will be disseminated through publication in a
48
49 peer-reviewed journal, or presentation at conferences.
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53 **Registration** This scoping review protocol has been registered in the
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55 Open Science Framework
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57 (https://osf.io/ub45n/?view_only=bb93eb94e1434a0f8196b3b61cffcec2).
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Strengths and limitations of this study

- There was hardly any review on financial toxicity in patients with lung cancer.
- This scoping review will be developed following the methodology described in the JBI Manual for Evidence Synthesis on scoping review protocol.
- This scoping review will explore and illustrate the degree, affecting factors, outcomes and intervention strategies of financial toxicity in patients with lung cancer.
- This scoping review will focus on financial toxicity of lung cancer patients, and the results may not to be generalizable to other cancers.
- This scoping review will be limited to include studies published in English.

INTRODUCTION

Lung cancer (LC), or bronchogenic carcinoma, is a proliferative malignant neoplasm arising from the primary respiratory epithelium.¹

Lung cancer is generally divided into two major histologic groups: non small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). As one of the most commonly diagnosed cancers globally, lung cancer has

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4 the second-ranked morbidity rate and the first-ranked mortality rate. In
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6 2020, GLOBOCAN has reported there were an estimated 2, 206, 771
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8 (11.4%) new cases and 1, 796, 144 (18.0%) cancer deaths of lung cancer
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10 worldwide.² Furthermore, a higher incidence (14.3%) and a higher
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12 mortality (21.5%) of lung cancer were found in males than the incidence
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14 (8.4%) and mortality (13.7%) in females.² Currently, lung cancer cannot
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16 be completely cured, which generally controlled by medication and
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18 treatment to prolong life. As a result, most of the time it is an ongoing
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20 process. With the progression of the cancer condition and the advance of
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22 new treatments, the increase of medical expenses is also inevitable.^{1, 3-6}

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30 Financial toxicity (FT) is objective financial burden on and subjective
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32 financial distress experienced by cancer patients as a result of their
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34 treatment.⁷ As a new concern that has emerged in the last decade, high
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36 prevalence of financial toxicity was reported in patients with various
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38 cancers worldwide.⁷⁻⁹ Factors related to financial toxicity were identified,
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40 involving baseline factors, cancer-related factors, medical insurance
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42 status, treatments, end of life care and so on.^{8, 10} Furthermore, financial
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44 toxicity negatively affects the patient's treatment, prognosis, quality of
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46 life (QoL), symptom burden and so on.⁷⁻¹⁰ And strategies to reduce
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48 financial toxicity have also been proposed at multiple levels (provider,
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50 clinic, hospital, and insurance and governmental).^{7, 8}

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58 The status of financial toxicity in patients with lung cancer is similar to
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4 the above situation. Study from Hazell et al. explored financial toxicity in
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6 lung cancer patients, demonstrating 38.2% participants were either “just
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8 getting on” or “struggling” financially, inability to afford basic
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10 necessities, <1 month of savings and being employed but on sick leave
11
12 were identified as risk factors of financial toxicity, and increased
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14 financial toxicity was correlated with a decrease in QoL.¹¹ Chen et al.’s
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16 study indicated 72.7% and 37.0% lung cancer patients reported
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18 catastrophic health spending and healthcare costs exceeded annual
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20 household income respectively, 83.7% participants perceived financial
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22 difficulty, and healthcare costs exceeding total annual household income
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24 and perceived financial difficulty were associated with poorer QoL.¹²
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33 However, the full landscape of studies on financial toxicity is unclear in
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35 lung cancer patients by far. Therefore, to identify the knowledge gaps
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37 between practice and evidence and propose recommendations for future
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39 studies, it’s crucial to review and summarize the current literature
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41 regarding financial toxicity in lung cancer patients.
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45 **OBJECTIVES**

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48 The objectives of this scoping review are to illustrate: (1) the degree of
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50 financial toxicity in lung cancer patients; (2) the contributing factors of
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52 financial toxicity in patients with lung cancer; (3) the impacts of financial
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54 toxicity on lung cancer patients; (4) the strategies to reduce financial
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56 toxicity in patients with lung cancer.
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METHODS

This protocol will be developed following the methodology described in the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis on scoping review protocol,¹³ which was based on Arksey and O'Malley's methodological framework,¹⁴ Levac et al's recommendations for applying this framework¹⁵ and Peters' enhancements of the framework.¹⁶ The proposed scoping review will be reported following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews checklist (PRISMA-ScR).¹⁷ The present protocol has been registered within the Open Science Framework (<https://osf.io/>).

Stage 1: identifying the research questions

According to the objectives, this scoping review is plan to answer the following main questions: (1) What evidence is available on degree of financial toxicity in patients with lung cancer; (2) What are the factors that affect financial toxicity in lung cancer patients; (3) What are the outcomes of financial toxicity on lung cancer patients; (4) What are the intervention strategies to deal with financial toxicity in patients with lung cancer.

Stage 2: identifying relevant studies

The participants of considering studies will be: (1) human being, (2) 18 years of age or older, (3) confirmed with a pathologic diagnosis of lung cancer, (4) reported financial toxicity. The concept, financial toxicity, was

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4 defined as the objective financial burden and subjective financial distress
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6 of patients with cancer, as a result of treatments using innovative drugs
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8 and concomitant health services.^{7, 18, 19} Objective financial burden stems
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10 from out-of-pocket spending on cancer drugs as well as the services that
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12 make up the treatment regimen, including medical imaging, radiotherapy,
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14 surgery, and other procedures.^{7, 19, 20} Subjective financial distress results
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16 from the accumulation of out-of-pocket spending from the time of
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18 diagnosis, the erosion of the household's wealth and nonmedical budget,
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20 and worry about the effectiveness of coping strategies available to and
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22 used by the patient.^{7, 19, 21} The context of studies will be globally acute
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24 care, primary health care, community care and so on. The type of studies
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26 will be primary quantitative studies, including randomized controlled
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28 trials, nonrandomized controlled trials, quasi-experimental studies, before
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30 and after studies, prospective and retrospective cohort studies,
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32 case-control studies, and cross-sectional studies. Qualitative studies,
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34 reviews, and conference abstracts were excluded.

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45 The search strategy will be developed as follows: The nine databases, The
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47 Cochrane Library, MEDLINE, Embase, CINAHL, Web of Science,
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49 Scopus, ProQuest, PsycINFO and Google Scholar, will be searched. The
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51 search terms will be divided into three parts, namely "Lung", "Cancer"
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53 and "Financial toxicity". The search field will be Title/Abstract. The
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55 language will be limited to English. The time period will be set as the day
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4 of database building to December 31, 2021. In addition, hand search will
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6 be performed for reference lists of the included literatures. The
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8 corresponding author will be contacted if necessary. A draft search
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10 strategy in MEDLINE was shown in online Supplemental Table S1.
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13 14 **Stage 3: study selection**

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16 All literatures identified by the search strategies will be exported from the
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18 databases/journals and imported into the EndNote respectively. After
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20 removing duplicates, the references will then be transferred into
21
22 Rayyan.²² A two-step process will be performed independently to select
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24 studies by two reviewers. According to the inclusion criteria described in
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26 Stage 2, the two reviewers will screen titles and abstracts of considering
27
28 studies firstly, and then screen full-texts. All disagreements between the
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30 above-mentioned two reviewers will be resolved by consensus, and a
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32 third reviewer will be invited if necessary. Pilot tests of study selection
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34 will be performed in 10% of all references. The formal study selection
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36 will begin until 75% agreement or greater of is achieved among
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38 reviewers. A PRISMA-ScR flow diagram (Figure 1) will be provided to
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40 show details of studies included and excluded during the study selection
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42 process.
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52 53 **Stage 4: charting the data**

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55 A structured data recording form will be used on Microsoft Excel to
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57 capture the data of interest from the selected studies. The detailed data
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4 will include author, year of publication, country, study design, setting,
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6 population and sample size, measure of financial toxicity, financial
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8 toxicity (financial burden and financial distress), affecting factor,
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10 outcome, intervention strategy and reference. To ensure consistency in
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12 data extraction, two reviewers will pilot test the form independently on a
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14 random sample of the included studies (10%). The form will be revised
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16 by an iterative process if necessary. In the formal data extraction stage,
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18 data will be extracted by one reviewer according to the objectives of this
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20 scoping review, and verified by another reviewer. Any disagreements
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22 between the two reviewers will be resolved by consensus, and a third
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24 reviewer will be invited if necessary. A draft data extraction form was
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26 presented in Table S2.
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34 35 **Stage 5: collating, summarizing and reporting the results**

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37 The synthesis will be performed using narrative summaries and thematic
38
39 analyses of the extracted data. Meanwhile, frequency distributions and
40
41 descriptive statistics will be used to present year of publication, country,
42
43 study design, setting, population and sample size, measure of financial
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45 toxicity, financial toxicity (financial burden and financial distress),
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47 affecting factor, outcome and intervention strategy. In addition, the
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49 degree of financial toxicity (financial burden and financial distress) will
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51 be summarized and analyzed according to the measurement methods. The
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53 affecting factors, outcomes and intervention strategies of financial
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4 toxicity (financial burden and financial distress) will be classified on the
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6 basis of the results. For the contributing factors, the categories may be
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8 demographic and socioeconomic factors, cancer related factors, medical
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10 insurance, treatments and so on. The outcomes may involve survival,
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12 mortality, treatment nonadherence, quality of life and symptom burden.
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14 The intervention strategies may be summarized from the level of
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16 healthcare providers, institutions and medical systems. See Table S3-S6.
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22 **Stage 6: consultation**

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24 A stakeholder consultation will be held to validate the findings in this
25
26 scoping review, and identify knowledge gaps for further research.
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28 Stakeholders will include clinicians, nurses, accountants, public servants
29
30 and methodological experts of evidence-based medicine. Their
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32 suggestions will be incorporated into our final manuscript of scoping
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34 review.
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40 **Patient and public involvement**

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42 Patients or the public will not be directly involved in the design, or
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44 conduct, or reporting, or dissemination plans of our research.
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48 **Ethics and dissemination**

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50 An ethical approval is not required for this scoping review protocol, nor
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52 for the scoping review. The results of this scoping review will be
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54 disseminated through publication in a peer-reviewed journal, or
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56 presentation at conferences.
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4 **Contributors** XY conceived the study; LF, MZ, CL, RZ, BW and WX
5
6 conceptualized the research questions; LF, WX and XY refined the
7
8 research questions; LF, CL and XY drafted the scoping review protocol.
9
10 All authors contributed to the refining of the study design, as well as to
11
12 the editing and revising of this protocol.
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18
19 Province Medical Science and Technology Plan (grant number:
20
21 2021KY1181), the Major Project of Jinhua City Science and Technology
22
23 Research Plan (grant number: 2021-3-051) and the General Project of
24
25 Jinhua Municipal Central Hospital Young and Middle-aged Scientific
26
27 Research Start-up Fund (grant number: JY2020-2-05).
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32 **Competing interests** None declared.
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35 **Patient consent for publication** Not required.
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38 **Provenance and peer review** Not commissioned; externally peer
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40 reviewed.
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45 **Figure 1 Flow diagram of study selection process**
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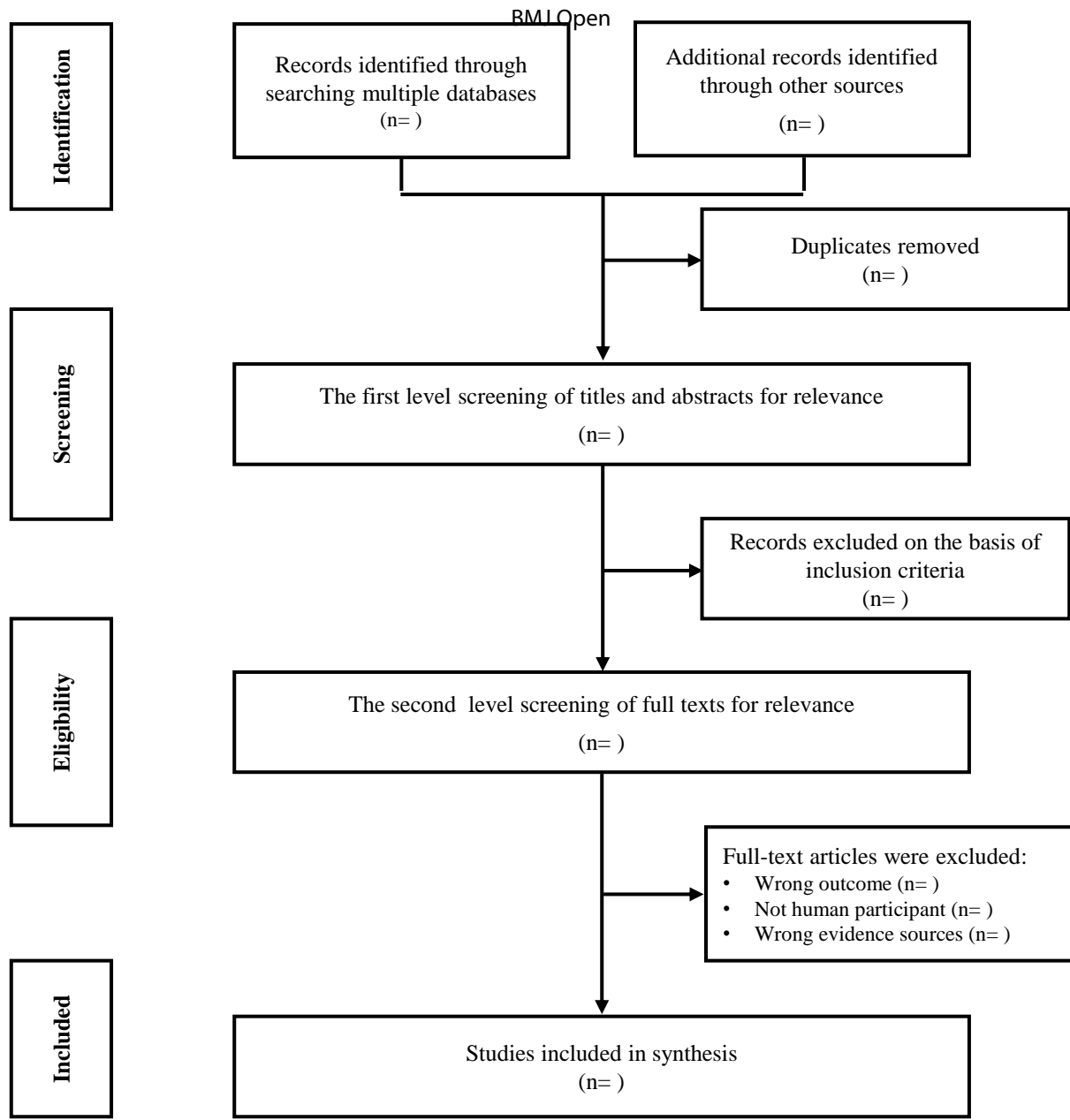


Figure 1 Flow diagram of study selection process

Identification

Screening

Eligibility

Included

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Table S1 Search strategy of MEDLINE

| # | Search strings |
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| 1 | (lung* OR bronch* OR pulmonary*).ab. |
| 2 | (cancer* OR tumor* OR tumour* OR neoplas* OR malignan* OR carcinoma*).ab. |
| 3 | (financial stress* OR financial toxicit* OR financial distress* OR financial burden* OR financial hardship* OR financial pressure* OR financial challenge* OR economic stress* OR economic toxicit* OR economic distress* OR economic burden* OR economic hardship* OR economic pressure* OR economic challenge*).ab. |
| 4 | #1 and #2 and #3 |

Table S2 The general information of included studies

| No. | Author | Year of publication | Country | Study design | Setting | Population and sample size | Measure of financial toxicity | Financial toxicity | Financial burden | Financial distress | Affecting factor | Outcome | Intervention strategy | Reference |
|-----|--------|---------------------|---------|--------------|---------|----------------------------|-------------------------------|--------------------|------------------|--------------------|------------------|---------|-----------------------|-----------|
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Table S3 The degree of financial toxicity in lung cancer patients according to different measures

| No. | Measure | Financial toxicity | Financial burden | Financial distress | Reference |
|-----|---------|--------------------|------------------|--------------------|-----------|
| 1 | | | | | |
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Table S4 The contributing factors of financial toxicity in lung cancer patients after classification

| No. | Category | Contributing factor | | | Reference |
|-----|----------|---------------------|------------------|--------------------|-----------|
| | | Financial toxicity | Financial burden | Financial distress | |
| 1 | | | | | |
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Table S5 The outcomes of financial toxicity in lung cancer patients after classification

| No. | Category | Outcome | | | Reference |
|-----|----------|--------------------|------------------|--------------------|-----------|
| | | Financial toxicity | Financial burden | Financial distress | |
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Table S6 The intervention strategies of financial toxicity in lung cancer patients after classification

| No. | Category | Intervention strategy | | | Reference |
|-----|----------|-----------------------|------------------|--------------------|-----------|
| | | Financial toxicity | Financial burden | Financial distress | |
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Financial Toxicity in Patients with Lung Cancer: A Scoping Review Protocol

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ABSTRACT

Introduction Lung cancer has the second-ranked morbidity rate and the first-ranked mortality rate worldwide. With the progression of the cancer condition and the advance of new treatments, the corresponding medical

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4 expenses have risen sharply. Nowadays, financial toxicity has become
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6 one of the most common concerns in cancer patients. However, the full
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8 landscape of studies on financial toxicity is unclear in lung cancer
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10 patients by far. Thus, this scoping review aims to summarize the degree,
11
12 affecting factors, outcomes, and intervention strategies of financial
13
14 toxicity in patients with lung cancer.
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18
19 **Methods and analysis** This scoping review will be developed following
20
21 the methodology described in the JBI Manual for Evidence Synthesis on
22
23 scoping review protocol, which was based on Arksey and O'Malley's
24
25 methodological framework, Levac et al's recommendations for applying
26
27 this framework, and Peters' enhancements of the framework. From the
28
29 day of database building to December 31, 2021, ten English databases
30
31 will be searched in the "Abstract" field with three key search terms
32
33 "Lung", "Cancer" and "Financial toxicity". The studies screening and
34
35 data extraction will be independently performed by two reviewers (MZ
36
37 and RZ). Any disagreements between the two reviewers (MZ and RZ)
38
39 will be resolved by consensus, and a third reviewer (BW) will be invited
40
41 if necessary. The results will be analyzed and presented using tables and
42
43 figures. This scoping review will be reported following the Preferred
44
45 Reporting Items for Systematic Reviews and Meta-Analyses extension
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47 for Scoping Reviews checklist (PRISMA-ScR).
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58 **Ethics and dissemination** An ethical approval is not required for this
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4 scoping review protocol, nor for the scoping review. The results of this
5
6 scoping review will be disseminated through publication in a
7
8 peer-reviewed journal, or presentation at conferences.
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11 **Registration** This scoping review protocol has been registered in the
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13 Open Science Framework
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15 (https://osf.io/ub45n/?view_only=bb93eb94e1434a0f8196b3b61cffcec2).
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22 **Strengths and limitations of this study**

- 23
24 ➤ This scoping review will be developed following the methodology
25 described in the JBI Manual for Evidence Synthesis on scoping
26 review protocol.
27
- 28 ➤ To include as many relevant studies as possible, we plan to use a
29 broad search strategy.
30
- 31 ➤ We plan to perform the optional sixth stage (consultation) in our
32 review.
33
- 34 ➤ This scoping review will be limited to include studies published in
35 English.
36
- 37 ➤ The quality of studies in this scoping review will not be assessed.
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53 **INTRODUCTION**

54 Lung cancer (LC), or bronchogenic carcinoma, is a proliferative
55 malignant neoplasm arising from the primary respiratory epithelium.¹
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4 Lung cancer is generally divided into two major histologic groups: non
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6 small cell lung cancer (NSCLC) and small cell lung cancer (SCLC). As
7
8 one of the most commonly diagnosed cancers globally, lung cancer has
9
10 the second-ranked morbidity rate and the first-ranked mortality rate. In
11
12 2020, GLOBOCAN has reported there were an estimated 2, 206, 771
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14 (11.4%) new cases and 1, 796, 144 (18.0%) cancer deaths of lung cancer
15
16 worldwide.² Furthermore, a higher incidence (14.3%) and a higher
17
18 mortality (21.5%) of lung cancer were found in males than the incidence
19
20 (8.4%) and mortality (13.7%) in females.¹ Currently, lung cancer cannot
21
22 be completely cured, but is generally controlled by medication and
23
24 treatment to prolong life. As a result, most of the time it is an ongoing
25
26 process. With the progression of the cancer condition and the advance of
27
28 new treatments, the increase in medical expenses are also inevitable.^{1, 3-6}
29
30 Financial toxicity (FT) is objective financial burden on and subjective
31
32 financial distress experienced by cancer patients as a result of their
33
34 treatment.⁷ As a new concern that has emerged in the last decade, a high
35
36 prevalence of financial toxicity was reported in patients with various
37
38 cancers worldwide.⁷⁻⁹ Factors related to financial toxicity were identified,
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40 involving baseline factors, cancer-related factors, medical insurance
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42 status, treatments, end of life care and so on.^{8, 10} Furthermore, financial
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44 toxicity negatively affects the patient's treatment, prognosis, quality of
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46 life (QoL), symptom burden and so on.⁷⁻¹⁰ And strategies to reduce
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4 financial toxicity have also been proposed at multiple levels (provider,
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6 clinic, hospital, insurance and governmental, and so on).^{7, 8, 11}
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9 The status of financial toxicity in patients with lung cancer is similar to
10 the above situation. The study from Hazell et al. explored financial
11 toxicity in lung cancer patients, demonstrating 38.2% of participants were
12 either “just getting on” or “struggling” financially, inability to afford
13 necessities, <1 month of savings and being employed but on sick leave
14 were identified as risk factors of financial toxicity, and increased
15 financial toxicity was correlated with a decrease in QoL.¹² Chen et al.’s
16 study indicated 72.7% and 37.0% of lung cancer patients reported
17 catastrophic health spending and healthcare costs exceeded annual
18 household income respectively, 83.7% of participants perceived financial
19 difficulty, and healthcare costs exceeded total annual household income
20 and perceived financial difficulty were associated with poorer QoL.¹³
21
22 However, the full landscape of studies on financial toxicity is unclear in
23 lung cancer patients by far. Therefore, to identify the knowledge gaps
24 between practice and evidence and propose recommendations for future
25 studies, it’s crucial to review and summarize the current literature
26 regarding financial toxicity in lung cancer patients.
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52 **OBJECTIVES**

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54 The objectives of this scoping review are to illustrate: (1) the degree of
55 financial toxicity in lung cancer patients; (2) the contributing factors of
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4 financial toxicity in patients with lung cancer; (3) the impacts of financial
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6 toxicity on lung cancer patients; (4) the strategies to reduce financial
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8 toxicity in patients with lung cancer.
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11 **METHODS**

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14 This protocol will be developed following the methodology described in
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16 the Joanna Briggs Institute (JBI) Manual for Evidence Synthesis on
17
18 scoping review protocol,¹⁴ which was based on Arksey and O'Malley's
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20 methodological framework,¹⁵ Levac et al's recommendations for applying
21
22 this framework and Peters' enhancements of the framework.^{16, 17} The
23
24 proposed scoping review will be reported following the Preferred
25
26 Reporting Items for Systematic Reviews and Meta-Analyses extension
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28 for Scoping Reviews checklist (PRISMA-ScR).¹⁸ The present protocol
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30 has been registered within the Open Science Framework (<https://osf.io/>).
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37 **Stage 1: identifying the research questions**

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40 According to the objectives, this scoping review is planning to answer the
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42 following main questions: (1) What evidence is available on the degree of
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44 financial toxicity in patients with lung cancer; (2) What are the factors
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46 that affect financial toxicity in lung cancer patients; (3) What are the
47
48 outcomes of financial toxicity on lung cancer patients; (4) What are the
49
50 intervention strategies to deal with financial toxicity in patients with lung
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52 cancer.
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58 **Stage 2: identifying relevant studies**

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4 The participants of considering studies will be: (1) human being, (2) 18
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6 years of age or older, (3) confirmed with a pathologic diagnosis of lung
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8 cancer, (4) reported financial toxicity. The concept, financial toxicity, was
9
10 defined as the objective financial burden and subjective financial distress
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12 of patients with cancer, as a result of treatments using innovative drugs
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14 and concomitant health services.^{7, 19, 20} Objective financial burden stems
15
16 from out-of-pocket spending on cancer drugs as well as the services that
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18 make up the treatment regimen, including medical imaging, radiotherapy,
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20 surgery, lost wages for patients or caregivers, and other procedures.^{7, 20,21}
21
22 Subjective financial distress results from the accumulation of
23
24 out-of-pocket spending from the time of diagnosis, the erosion of the
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26 household's wealth and nonmedical budget, and worry about the
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28 effectiveness of coping strategies available to and used by the patient.^{7, 20,}
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30 ²² The context of studies will be globally acute care, primary health care,
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32 community care and so on. The type of studies will be primary
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34 quantitative studies, including randomized controlled trials,
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36 nonrandomized controlled trials, quasi-experimental studies, before and
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38 after studies, prospective and retrospective cohort studies, case-control
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40 studies, and cross-sectional studies. Qualitative studies, reviews, and
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42 conference abstracts were excluded.
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56 The search strategy will be developed as follows: The ten databases, The
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58 Cochrane Library, MEDLINE, Embase, CINAHL, Web of Science,
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4 Scopus, ProQuest, PsycINFO, EconLit and Google Scholar, will be
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6 searched. The search terms will be based on three key terms, namely
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8 “Lung”, “Cancer” and “Financial toxicity”. The search field will be
9
10 Title/Abstract. The language will be limited to English. The period will
11
12 be set as the day of database building to December 31, 2021. In addition,
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14 hand search will be performed for reference lists of the included
15
16 literature. The corresponding author will be contacted if necessary. A
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18 draft search strategy in MEDLINE was shown in online Supplemental
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20 Table S1.
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26 27 **Stage 3: study selection** 28 29

30 All literature identified by the search strategies will be exported from the
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32 databases/journals and imported into the EndNote respectively. After
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34 removing duplicates, the references will then be transferred into
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36 Rayyan.²³ A two-step process will be performed independently to select
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38 studies by two reviewers (MZ and RZ). According to the inclusion
39
40 criteria described in Stage 2, two reviewers (MZ and RZ) will screen
41
42 titles, and in the next step will screen abstracts of considering studies
43
44 firstly, and then screen full texts. All disagreements between the
45
46 above-mentioned two reviewers (MZ and RZ) will be resolved by
47
48 consensus, and a third reviewer (BW) will be invited if necessary. Pilot
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50 tests of study selection will be performed in 10% of all references. The
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52 formal study selection will begin until 75% agreement or greater is
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4 achieved among reviewers.¹⁴ A PRISMA-ScR flow diagram (Figure 1)
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6 will be provided to show details of studies included and excluded during
7
8 the study selection process.
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11 **Stage 4: charting the data**

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14 A structured data recording form will be used on Microsoft Excel to
15
16 capture the data of interest from the selected studies. The detailed data
17
18 will include author, year of publication, country, study design, setting,
19
20 population and sample size, measure of financial toxicity, financial
21
22 toxicity (financial burden and financial distress), affecting factor,
23
24 outcome, intervention strategy and reference. To ensure consistency in
25
26 data extraction, two reviewers (MZ and RZ) will pilot test the form
27
28 independently on a random sample of the included studies (10%). The
29
30 form will be revised by an iterative process if necessary. In the formal
31
32 data extraction stage, data will be extracted by one reviewer (MZ)
33
34 according to the objectives of this scoping review and verified by another
35
36 reviewer (RZ). Any disagreements between the two reviewers (MZ and
37
38 RZ) will be resolved by consensus, and a third reviewer (BW) will be
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40 invited if necessary. A draft data extraction form was presented in Table
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52 **Stage 5: collating, summarizing and reporting the results**

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55 The synthesis will be performed using narrative summaries and thematic
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57 analyses of the extracted data. Meanwhile, frequency distributions and
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4 descriptive statistics will be used to present the year of publication,
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6 country, study design, setting, population and sample size, the measure of
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8 financial toxicity, financial toxicity (financial burden and financial
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10 distress), affecting factor, outcome and intervention strategy. In addition,
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12 the degree of financial toxicity (financial burden and financial distress)
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14 will be summarized and analyzed according to the measurement methods.
15
16 The affecting factors, outcomes and intervention strategies of financial
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18 toxicity (financial burden and financial distress) will be classified based
19
20 on the results. For the contributing factors, the categories may be
21
22 demographic and socioeconomic factors, cancer related factors, medical
23
24 insurance, treatments and so on. The outcomes may involve survival,
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26 mortality, treatment nonadherence, quality of life and symptom burden.
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28 The intervention strategies may be summarized from the level of
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30 healthcare providers, institutions and medical systems. See Table S3-S6.
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40 **Stage 6: consultation**

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42 Stakeholder consultation will be held to validate the findings in this
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44 scoping review and identify knowledge gaps for further research.
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46 Stakeholders will include clinicians, nurses, accountants, public servants
47
48 and methodological experts of evidence-based medicine. Their
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50 suggestions will be incorporated into our final manuscript of scoping
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52 review.
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58 **Patient and public involvement**

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4 Patients or the public will not be directly involved in the design, conduct,
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6 reporting, or dissemination plans of our research.
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9 **Ethics and dissemination**

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11 Ethical approval is not required for this scoping review protocol, nor for
12
13 the scoping review. The results of this scoping review will be
14
15 disseminated through publication in a peer-reviewed journal, or
16
17 presentation at conferences.
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21
22 **Contributors** RX and XY conceived the study; LF, MZ, CL, RZ, BW,
23
24 WX and BX conceptualized the research questions; LF, WX, BX, RX and
25
26 XY refined the research questions; LF, CL, RX and XY drafted the
27
28 scoping review protocol. All authors contributed to the refining of the
29
30 study design, as well as to the editing and revising of this protocol.
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35 **Funding** This work was supported by the Key Project of Jinhua City
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37 Science and Technology Research Plan (grant number: 2020-3-040).
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41 **Competing interests** None declared.
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44 **Patient consent for publication** Not required.
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47 **Provenance and peer review** Not commissioned; externally peer
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49 reviewed.
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53 **Figure 1** Flow diagram of study selection process
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56 57 58 **REFERENCES** 59 60

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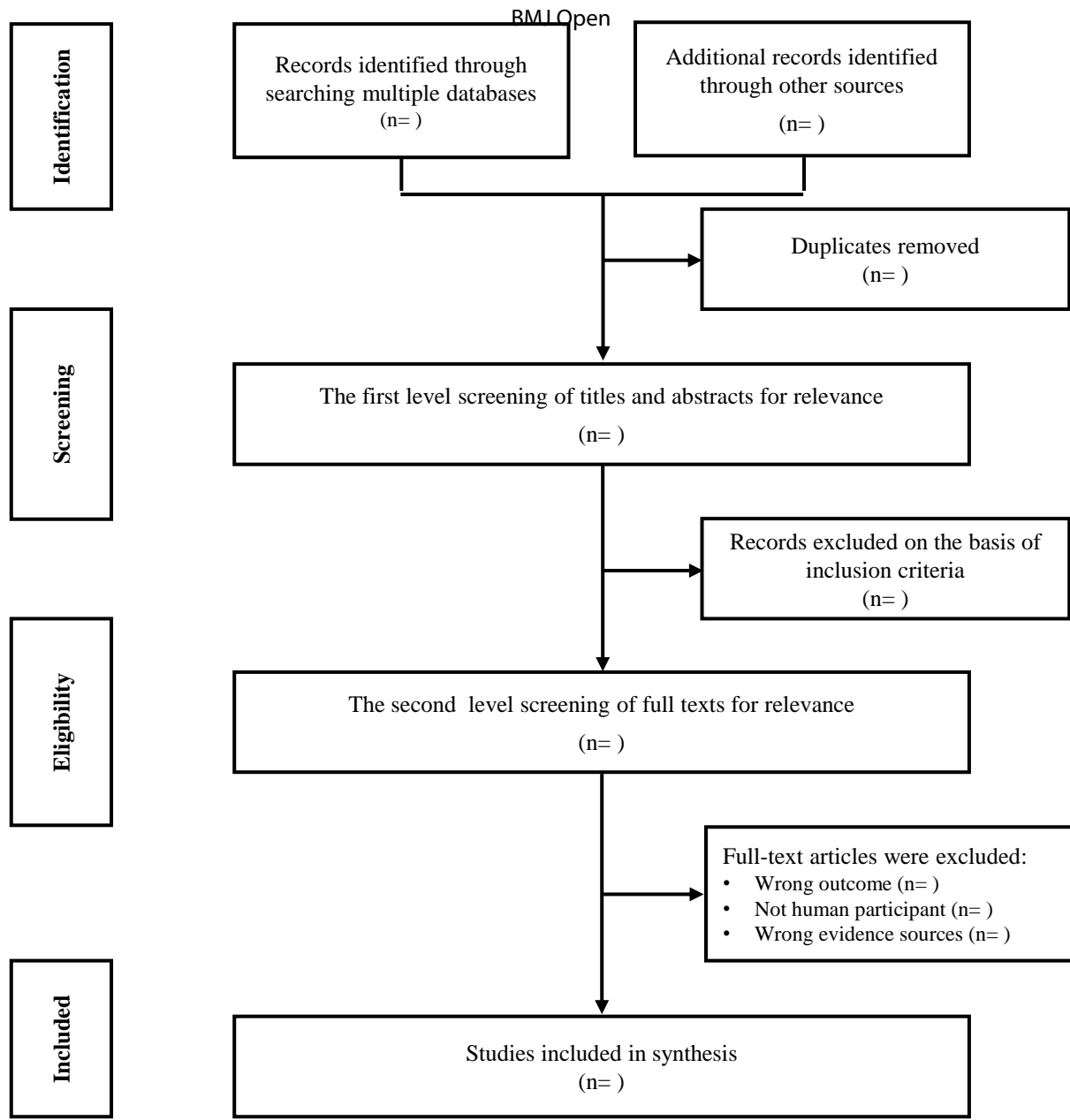


Figure 1 Flow diagram of study selection process

Identification

Screening

Eligibility

Included

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Table S1 Search strategy of MEDLINE

| # | Search strings |
|---|---|
| 1 | (lung* OR bronch* OR pulmonary*).ab. |
| 2 | (cancer* OR tumor* OR tumour* OR neoplas* OR malignan* OR carcinoma*).ab. |
| 3 | (financial stress* OR financial toxicit* OR financial distress* OR financial burden* OR financial hardship* OR financial pressure* OR financial challenge* OR economic stress* OR economic toxicit* OR economic distress* OR economic burden* OR economic hardship* OR economic pressure* OR economic challenge*).ab. |
| 4 | #1 and #2 and #3 |

Table S2 The general information of included studies

| No. | Author | Year of publication | Country | Study design | Setting | Population and sample size | Measure of financial toxicity | Financial toxicity | Financial burden | Financial distress | Affecting factor | Outcome | Intervention strategy | Reference |
|-----|--------|---------------------|---------|--------------|---------|----------------------------|-------------------------------|--------------------|------------------|--------------------|------------------|---------|-----------------------|-----------|
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Table S3 The degree of financial toxicity in lung cancer patients according to different measures

| No. | Measure | Financial toxicity | Financial burden | Financial distress | Reference |
|-----|---------|--------------------|------------------|--------------------|-----------|
| 1 | | | | | |
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| 3 | | | | | |

Table S4 The contributing factors of financial toxicity in lung cancer patients after classification

| No. | Category | Contributing factor | | | Reference |
|-----|----------|---------------------|------------------|--------------------|-----------|
| | | Financial toxicity | Financial burden | Financial distress | |
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |

Table S5 The outcomes of financial toxicity in lung cancer patients after classification

| No. | Category | Outcome | | | Reference |
|-----|----------|--------------------|------------------|--------------------|-----------|
| | | Financial toxicity | Financial burden | Financial distress | |
| 1 | | | | | |
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Table S6 The intervention strategies of financial toxicity in lung cancer patients after classification

| No. | Category | Intervention strategy | | | Reference |
|-----|----------|-----------------------|------------------|--------------------|-----------|
| | | Financial toxicity | Financial burden | Financial distress | |
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