Supplementary

Table S1

Study	First author & year publi-shed	Factors that decrease the risk of bias	Factors that increase the risk of bias	SORT
P1[10]	Restrepo DJ, 2019, USA	- A nationwide cohort,large and quality-controlled data identified from the National Cancer Data Base (NCDB). Data from 2004–2015 - Large sample size – N= 2,445,870 - Well-established inclusion and exclusion criteria and methods - Demographic, socioeconomic, and tumor-specific predictors were compared between patients who refused breast cancer surgery versus those who agreed to surgery, using bivariate and multivariate models.	- Retrospective study - Non-randomized study - Data extraction from NCDB, which does not contain detailed information regarding the specifics or extent of nonsurgical treatment, and all reasons underlying patient treatment refusal	2
P2[11]	Coffman A, 2019, USA	- A nationwide cohort, a large and quality-controlled data identified from the NCDB (from 2004 to 2013). - Large sample-48902 (1795 refused treatment) -Well-established inclusion and exclusion criteria, outcomes - Univariate and multivariate logistic regression modeling was used to identify predictive factors of refusing surgery	- Retrospective analyzes - Selection bias that is inherent with all retrospective reviews. It is possible that the cohort of patients who refused surgery were less healthy or able to tolerate surgery in ways that could not be captured by the NCDB data.	2
P3[12]	Crippen MM, 2018, USA	- A cohort with a large,quality-controlled data identified from Surveillance, Epidemiology and End Results (SEER) database from 1989 to 2014 - N=598,270 were compared to patients who refused recommended surgery (N=53,582) - Groups were compared for patient social demographics and clinical characteristics. Binary logistic regression was performed to determine independent predictors of surgery refusal.	- Retrospective review - Data extraction from SEER, which does not contain detailed information regarding the specifics or extent of nonsurgical treatment. - It does not differentiate between those refusing surgery in favor of nonsurgical management versus those refusing all type of treatment.	2
P4[13]	Rahouma M, 2018, USA.	- The NCDB (data from 2004 to 2014) - N=18,459 (708 - 3.8% refused surgery) - Sample and inclusion criteria were well defined -Comparisons between the entire cohort and between propensity-matched groups were performed using analysis of variance and X^2 tests Logistic regression to identify predictors of refusing surgery	- Retrospective, cross-sectional - The database does not contain details about the extent and type of clinical staging	2
P5[14]	Tohme S, 2018, USA	- A cohort with a large and quality-controlled data - NCDB (2003- 2012) - N=26,358 - Multivariate models to identify factors predicting failure to undergo surgery and assess the impact on survival.	- Retrospective cohort review - The NCDB does not include the granularity to determine exactly why patients refused surgery and who was the primary provider directing their health choices.	2
P6[15]	Cheragh-lou S, 2018, USA	- A nationwide research with a large sample – NCDB - N=36251 (N=356 refused treatment) - A comparative study - Well-established objectives, criteria and methods Multivariate Cox regression as well as univariate Kaplan–Meier analyses were conducted.	- Retrospective review -Lack of some relevant information in database, such as about social factors - Unable to access data about the reasons behind patient treatment refusal	2
P7[16]	Chiang TY, 2015,Tai-wan	The study analyzed data from a case management system from 2010 to 2012 in Taiwan N= 14974 (N=253 patients- refused treatment) - Using the PRECEDE Model as a framework and logistic regression analysis to identify independent variables associated with refusal of therapy in cancer patients. A multivariate logistic regression model was also applied.	- Retrospective design - Data extracted from a databases/records from just one medical center in Taiwan	3
P8[17]	Gaitanidis, 2018, Greece	- A nationwide search of SEER database for patients with breast cancer diagnosed (2004-2013). - Sample size: N=528,311 (3389 who refused treatment) - Well-established inclusion and exclusion criteria	- Retrospective design. Such databases may often be associated with miscoding and missing information. - In addition, there was no information concerning the use of chemotherapy and whether its use was also dismissed by patients.	2
P9[18]	Massa ST, 2017, USA	- A cohort with a large, quality-controlled data identified from SEER (2004-2013) - N=5786 (138 patients who refused treatment) - They used a multivariate logistic regression model (comparative study)	- Retrospective observational nature - Data extraction from records/ databases - Lack of potentially relevant details. These details include some tumor information.	2
P10[19]	Suh WN, 2017, South Korea	- A cohort retrospective review of patient records (2010- 2014) -N=617 patients (149 who refused treatment [non-treatment group] were compared with 468 who received anti-cancer treatment [treatment group]) - A comparative study – controlled data	- Retrospective review - A non-randomized observational study - Data from one institution and selection bias in dividing the patients into two groups were also limitations.	3
P11[20]	Gilbar P, 2017, Austra-lia	Cohort selected (2010- 2014) Well-defined inclusion criteria and methodology.	-A retrospective observational from a single institution - Sample size-N=109 (12 refused treatment) - Lack of some important information about sociodemographic factors on database	3
P12[21]	Chen SJ, 2015, Taiwan	- A large cohort retrospective from Taiwan Cancer Registry Database (a national cohort) - N=35,095 - Well-defined inclusion criteria and methodology - univariate and multivariate analyses were used to identify predictors for refusal	- Retrospective analysis on secondary databases. - Some relevant factors such as patient occupation and family care and support were not able to be incorporated.	2
P13[22]	Chiang TY, 2018, Taiwan	- A case-control study, longitudinal database and secondary analysis of population-based data (2009- 2012) - Logistic regression was used to reveal the factors related to refusing treatment. -N=408 (68 case-group X 340 control-group)	- The study consisted of a secondary analysis of data and subjective measurement could not be evaluated. - A non-randomized observational study - Among case management benchmarks, this study measured the rates of refusing treatment and discontinuing treatment	3
P14[23]	Stavas MJ, 2015, USA	- A cohort with a large, robust, quality-controlled data identified from SEER database (1988 – 2010) - N=285,641 (N=3,795 refused treatment) - A comparative study -Well-defined methodology - univariate and multivariate analyses were used to identify predictors for refusal	-Retrospective observational nature -A non-randomized observational study -Lack of important details about performance status, previous treatment in some records/ databases	2
P15[24]	Lu PW, 2020 USA	- A large cohort- NCDB (2004-2015) - N=151,020 (N=1,071 refused surgery) - Well-defined inclusion criteria - Patients who underwent surgery were compared to those who refused surgery. -Multivariable analysis to identify factors associated with surgery refusal.	- Retrospective observational design - A non-randomized observational study - Some incomplete information in database- some factors that can influence patients' decision making when considering surgery that is not captured by the NCDB	2
S1[25]	Wan J et al. 2018. China	- Several authors - Cohort selection between 2007 and 2015 - Well-defined inclusion and exclusion criteria - Well-defined methodology and outcomes	- Sample size (N=57) - Retrospective observational design - Data records from just one center (China) - Lack of some relevant information about patients' characteristics in records	3
S2[26]	Dronkers EAC, 2015. Nether-lands	- Sample Size (N=829) - Cohort selection between 2010 and 2012. Well-defined inclusion and exclusion criteria - Well-defined methodology - Multivariate analysis using logistic regression methods to determine predictive factors associated with nonstandard treatment	-Retrospective observational design - Based on medical records - Data from just one center	2
S3[27]	Parhar HS, 2018, Canada	- Sample size (N= 58,816 candidates for surgery and 1,550 refused surgery) - Cohort selection from 2014 to 2014. - Well-defined methodology - Multivariable logistic regression was used to identify demographic and clinical factors associated with patient choice of nonsurgical treatment	- Retrospective observational design (cross-sectional) - Incomplete data from records - Data from just one country (Canada)	3
S4[28]	Wallace SK, 2016, USA	- a large cohort -NCDB (1998- 2011) - N=147,713 (2.707 refused chemotherapy) - Well-defined inclusion and exclusion criteria - Well-defined methodology - Multivariable logistic regression was used to identify demographic and clinical factors associated with patient choice of nonsurgical treatment - A comparative study	- Retrospective study - Non-randomized observational study - The relative proportion of unavailable data, which is a limitation of the ongoing nature of the NCDB data collection process - Data from just one country	2
S5[9]	Sowerbutts, 2015, UK	- A qualitative nested component of a larger quantitative project - Well-defined inclusion and exclusion criteria - Well-defined methodology - Transcripts were analyzed using the Framework method.	-Sample size (N=28) - A case-study - The overall sample for the most part was comprised of patients who underwent surgery but also contained a larger proportion of patients being treated with hormone therapy, who left the decision up to the surgeon - Does participation of relatives in the interview influence the decision treatment? - selection bias	3
I1[30]	Rapp, 2019, USA	- Intentional sampling - Sample size (N= 498,927, of whom 5,757 refused surgeries) - Multicentric - Several researchers - Well-characterized disease diagnosis - Well-defined inclusion and exclusion criteria - The Multivariable logistic regression models were used to assess association between sociodemographic variables and surgery refusal.	- Cross-sectional, retrospective study - Several types of cancer (heterogeneous population) - Limitations inherent in this retrospective analysis, i.e., unmeasured confounding, the study was limited by the inability to adjust for comorbidities given the lack of such information in database cancer registries.	2
I2[31]	Islam KM, 2015, USA	- Sample size (N=14,786), intentional sampling - Well-defined inclusion and exclusion criteria - The data used in the analyses were a subset of the Nebraska Cancer Registry (NCR) data, including all prostate cancer incidences recorded by the cancer registry (1995- 2012) - Well-defined methodology	- Retrospective, cross-sectional design - Analysis of medical records from an oncological center database - Sample from just a single center - Incomplete information about some socioeconomic factors in records	3

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