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Impact of Cancer Diagnosis on Non-Cancer Chronic Disease Medication Adherence – A Systematic Literature Review

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BACKGROUND

A cancer diagnosis may affect the management of other comorbid chronic conditions. An evaluation of change in adherence to medications for these conditions after a cancer diagnosis may help in understanding the effect of cancer.

OBJECTIVE

This study aimed to summarize existing literature assessing the impact of cancer diagnosis on adherence to medications for non-cancer chronic conditions.

METHODS

This systematic review was performed using the Preferred Reporting Items for Systematic Reviews and Meta-Analysis (PRISMA) statement. PubMed, EMBASE, and all databases of Web of Science were searched through February 2022 using the terms “change” and “chronic” and “medication” and “adherence” and “after” and “cancer diagnosis”. References of included studies were also manually searched. Studies were included if they were retrospective cohort studies in which cancer diagnosis was the exposure, and adherence to non-cancer chronic disease medications before and after cancer was one of the outcomes. At least two investigators independently determined the eligibility of studies.

RESULTS

This study identified sixty-five published articles. Eleven studies published between 2013 and 2021 were included based on the inclusion and exclusion criteria. The most commonly studied type of cancer was breast cancer (n=11[100.00%]), followed by colorectal cancer (n=6[54.55%]). The most evaluated class of medications for non-cancer chronic conditions were antidiabetics (n=7[63.64%]) and antihyperlipidemics (statins) (n=7(63.64%]), followed by antihypertensives (n=5[45.45%]). The types of statistical analysis techniques used varied substantially, with difference-in-differences being the most preferred (n=4[33.33%]). Overall, the majority of studies (n=10 [90.91%]) reported some decline in medication adherence after a cancer diagnosis.

Table 1. Quality Assessment

JBI Checklist Questions	Banegas et al. 2018	Calip et al. 2013	Calip et al. 2015	Chou et al. 2017	Hou et al. 2020	Lund et al. 2021	Santorelli et al. 2016	Spees et al. 2020	Stuart et al. 2015	Yang et al. 2016	Zanders et al. 2015
Were the two groups similar and recruited from the same population?	NA	NA	NA	Unclear	Unclear	Yes	Yes	Yes	Yes	NA	Yes
Were the exposures measured similarly to assign people to both exposed and unexposed groups?	NA	NA	NA	No	No	No	No	No	Yes	NA	Yes
Was the exposure measured in a valid and reliable way?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	No	Yes
Were confounding factors identified?	Yes	No	No	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes
Were strategies to deal with confounding factors stated?	Yes	No	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Were the groups/participants free of the outcome at the start of the study?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes
Were the outcomes measured in a valid and reliable way?	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear	Yes	Yes
Was the follow up time reported and sufficient to be long enough for outcomes to occur?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Unclear
Was follow up complete, and if not, were the reasons to loss to follow up described and explored?	Yes	N	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear
Were strategies to address incomplete follow up utilized?	NA	Yes	Unclear	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Unclear
Was appropriate statistical analysis used?	Unclear	Unclear	No	Unclear	Yes	Yes	Yes	Yes	No	Yes	Yes

RESULTS (CONT’D)

Table 2. Study Characteristics

Author, year, location	Age group, N	Cancer type	Chronic condition	Comparison group	Non-cancer chronic condition medication	Duration of follow-up	Statistical analysis technique	Impact on adherence
Banegas et al., 2018, US	≥18 years, 10,177	PC, BC, CC	HLD[c]	Same patients[d]	Statins	-2 years to +2 years	Generalized estimating equation analyses	Decreased (all cancers, BC, CC) or remained the same (PC)
Calip et al., 2013, US	≥18 years, 1,393	BC	Not specified	Same patients[d]	Statins	-1 year to +3 years (following treatment period)	Simple comparison of mean MPR	Decreased initially followed by an increase (not to baseline levels)
Calip et al., 2015, US	≥18 years, 4,216	BC	DM[c]	Same patients[d]	First-line DM medications	-1 year to +3 years (following treatment period)	McNemar Test	Decreased initially followed by slight increase (not to baseline levels)
Chou et al., 2017, US	>65 years, 1,142	BC	Depression	No cancer group	SSRI, SNRI, TCA, MAO inhibitors, other antidepressants	-2 years to +1 year	Difference-in-differences	No difference
Hou et al., 2020, TW	≥20 years, 12,003	Selective Cancers[a]	Glaucoma	No cancer group	Glaucoma medication	-2 years to +2 years	Difference-in-differences	Decreased
Lund et al., 2021, US	≥66 years, 34,395	BC, PC, NSCLC, CC	DM, HTN, HLD	No cancer group	Anti-hypertensives, non-insulin antidiabetics and statins	-1.5 years to +2 years	Difference-in-differences	Varied by cancer and chronic condition type
Santorelli et al., 2016, US	≥66 years, 9,340	BC	DM, HTN, lipid disorders	No cancer group	Any oral diabetes class medications, any hypertension class medications, and statins	-1 year to +2 years	Logistic regression and generalized estimating equation analyses	Increased odds of non-adherence (DM); no difference (HTN, HLD)
Spees et al., 2020, US	≥18 years, 3,088	BC, NSCLC, CC	DM, HTN, HLD	No cancer group	Not specified (statins, antihypertensives, antidiabetics)	-5 months to +1 year	Difference-in-differences	Decreased (only HLD)
Stuart et al., 2015, US	≥65 years, 32,855	Not specified	Not specified	No cancer group	OHAs, RAAS-Is and Statins	-0.5 years to + 0.5 years (following a 1-month index month)	Multivariable regression methods	Decreased
Yang et al., 2016, US	≥18 years, 36,149	BC	HTN, HLD, thyroid diseases, GERD, DM, osteoporosis	Same patients[d]	Various	-1 year to + 1.5 years	McNemar Test	Decreased (all conditions)
Zanders et al., 2015, NL	≥ 30 years, 16,172	Any cancer[b]	DM[c]	No cancer group	All glucose lowering drugs (anti-diabetic medications)	Unclear	Interrupted time-series analysis - segmented linear auto-regression analysis	Decreased

All time points in the follow-up were measured in years with respect to the time of diagnosis (considered as 0); primary outcome was medication adherence

[a] types of cancers were selected based on the leading causes of death; [b] except non-melanoma skin cancer; [c] Not stated explicitly; [d] before and after cancer

BC, breast cancer; PC, prostate cancer; NSCLC, non-small cell lung cancer; CC, colorectal cancer; DM, diabetes mellitus; HTN, hypertension; HLD, hyperlipidemia; GERD, gastroesophageal reflux disease; SSRI, selective serotonin reuptake inhibitors; SNRI, serotonin and norepinephrine reuptake inhibitors; TCA, tricyclic antidepressants; MAO inhibitors, monoamine oxidase inhibitors; OHAs, oral hypoglycemic agents (including metformin, sulfonylureas, alpha-glucosidase inhibitors, amylinomimetics, dipeptidyl peptidase-4 inhibitors, and glucagon-like peptide-1 inhibitors); RAAS-Is, renin-angiotensin-aldosterone system inhibitors (including angiotensin-converting enzyme inhibitors and angiotensin receptor blockers); MPR, medication possession ratio

CONCLUSIONS

This systematic literature review confirms the high medication nonadherence burden that exists in cancer patients with comorbid chronic conditions. It is important that interventions are planned, in accordance with practice guidelines, to routinely monitor and improve adherence to non-cancer comorbid conditions, which may invariably have a significant impact on cancer outcomes.

REFERENCES

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