

Does Altruism Affect Participation in Cancer Research? A Systematic Review

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Abstract

Background: The impact of altruism on enrollment and longitudinal follow-up among cancer patients participating in clinical research studies remains poorly understood. This systematic review assesses published data reporting altruism as a motivator in cancer research and derives objective definitions of the four subtypes of altruism to permit future investigation in prospective therapeutic and non-therapeutic studies.

Method: A qualitative systematic review of altruism and cancer was conducted according PRISMA after a literature search of PubMed, Embase, Cochrane, and PsychINFO databases. Study aims, methodology, outcomes, and conclusions were extracted to perform qualitative analysis of altruistic motivations among cancer research participants. Quality and risk of bias were assessed using the Joanna Briggs Institute (JBI) Critical Appraisal tool for Systematic Reviews Checklist for Qualitative Research.

Results: Of 78 full-text manuscripts, fourteen met eligibility criteria for analysis, all of which used semi-structured interviews or questionnaires to study subsets of cancer patients participating in therapeutic clinical trials or non-therapeutic biobanking. Four distinct subtypes of altruism were demonstrated and defined according to an association map having the following four domains: personal benefit, benefit to family (kinship), benefit to others, and social exchange.

Conclusion: Different types of altruism among cancer patients were observed both in therapeutic and non-therapeutic studies. Altruism remains as an underrecognized factor that affects clinical research studies.

Background

Enrollment and sustained participation of eligible patients in research studies are fundamental to transforming cancer care in the era of personalized medicine. Previous studies have investigated operational factors causing clinical trial participation rates to vary between 0.5-3.0% depending on the age, sex, race, and performance status of a target population.[1] Examples include trial availability, eligibility requirements, financial stressors, barriers to consent, and site-specific limitations of the academic and community settings.[2] In contrast, the impact of patient motivators on enrollment and long-term follow-up remains poorly understood.

This systematic review assesses published evidence regarding altruism and its impact on long-term participation in cancer research. Prior qualitative studies and questionnaires evaluating motivators to participate in research have been conducted primarily in the field of organ transplantation and, to a lesser extent, cancer. A variety of motivators have been identified, including optimism, religious belief, and emotion.[3, 4] Altruism is a common theme but is confounded by perceptions of self-interest and hope for personal benefit in the setting of therapeutic studies.[5, 6] Conversely, virtually all non-therapeutic studies and biomarker discovery efforts preclude the possibility of benefit to participants or their families during

the process of informed consent. This stipulation may have unintended consequences affecting study enrollment and withdrawal among at-risk populations.

We hypothesize that altruism affects recruitment and retention of cancer research participants. In order to create an operational definition of altruism, this systematic review evaluated published qualitative or quantitative analyses to link participant behaviors with the type of altruism affecting participation. Altruism may create unmeasured confounding affecting the baseline characteristics of a study cohort and become an important source of informative censoring during long-term observational studies.

Methods

Study Design

This study evaluated published manuscripts defining altruistic behaviors in cancer research. The study was registered with PROSPERO (Registration ID: CRD42020169319) and conformed to the Preferred Reporting Items for Systematic review and Meta-Analyses Protocols (PRISMA-P) checklist.[7]

Literature Search

A preliminary search of PubMed, Embase, Cochrane, and PsychINFO sources was conducted by one reviewer (M.M). The strategy searched combinations of terms related to altruism and cancer in prospective as well as retrospective studies between inception and November 2019 (Appendix A). Relevant MeSH terms of altruism, such as donation, selflessness, philanthropy, self-sacrifice, warm glow, and self-motivation were grouped and linked by the suffix “OR”. The second search included MeSH terms indicating cancer, such as neoplasm and tumor, grouped by the suffix “OR”. The two groups were then connected by the suffix “AND”.

Eligibility Criteria

Research publications defining or discussing altruism were screened independently by two reviewers (D.H. and J.R.) based on title and abstract. Eligibility required: publication of primary research data in a peer-reviewed journal; full-text access in English; human subjects older than age 18 years; and consent to participate in either therapeutic or non-therapeutic cancer research studies including biobanking efforts. Protocol-specific exclusions were: manuscripts presented without structured data; unclear primary or secondary outcomes; Grey literature; opinion pieces; commentaries; and editorials. Conflicts between reviewers were resolved through discussion until agreement was achieved.

Data Extraction and Quality

Two investigators (D.H and J.R.) extracted the following data: country of origin, year, type of study, sample size, study groups, aim of study, study design, outcomes, results, type of altruism identified, and conclusions. Preliminary search results were imported into Covidence, and duplicates were removed.

Methodological quality of eligible studies was evaluated using The Joanna Briggs Institute (JBI) Critical Appraisal tool for Systematic Reviews Checklist for Qualitative Research.[8] Study quality was evaluated by two independent reviewers according to a pre-specified assessment checklist. Disagreements regarding by-item and overall quality rating were resolved by consensus or third-party adjudication if consensus could not be reached.

Results

Common Elements

The review process identified 1421 publications across four databases summarized by the PRISMA diagram in Figure 1. After removing duplicates (n=271) and records without abstracts (n=1062), 78 full-text articles were identified, of which 64 studies were excluded on the basis of their design, study population, or absence of a clear definition of altruism.

These eligibility criteria produced 14 studies (Table 1). All 14 studies investigated behaviors and attitudes toward clinical trial participation or tissue donation utilizing semi-structured interviews or questionnaires, including ten therapeutic clinical trials and four non-therapeutic tissue banking studies. Of the ten clinical trials, nine were Phase III randomized studies with one Phase I clinical trial.

Types of Altruism

Each study was condensed into summary statements describing concrete behaviors exhibited by study participants. Summary statements were then aligned according to the four subtypes of altruism in Table 2: pure altruism, weak altruism, reciprocal altruism, and hypothetical altruism.

Pure altruism described participant concern for the welfare of others and the investigators of the research study and embraced the moral value of helping others and society as a whole without expectation of medical or economic compensation. Reciprocal altruism, otherwise known as conditional altruism (Bidad et al),[9] combined the desire to help others with the expectation of personal benefit as a result of study participation, including potential indirect health benefits that might accrue during non-therapeutic studies. Weak altruism reflected the desire to return something of benefit to others and society as a whole but was not identified as the primary motivator for study participation. “Hypothetical” altruism described the stated, but untestable, the willingness of a study participant to accept assignment to the control arm of a randomized therapeutic clinical trial even though the eligibility criteria allowed that participant to withdraw and receive study drug.

Association Map

Examination of the summary statements revealed four defining features of participant behavior differentiating four subtypes of altruism (Table 3): expectations of personal benefit; benefit to others; social exchange, and impact on family/kinship. The resulting association map provides an objective basis to distinguish participant behaviors in future studies. Characteristics of personal benefit included:

positive impact on disease prognosis, restoration of hope, or financial compensation. Benefit to others included measurable gain for other patients and/or medical staff. Social exchange was defined as the participant's intent to benefit the medical staff and contribute to generalized scientific knowledge. Care for the medical staff, investigators, and the hospital was therefore common to both "benefit to others" and "social exchange." Kinship reflected consideration for family members as the reason for altruistic behaviors.

Characteristic Features

Pure altruism and reciprocal altruism were most commonly identified during this systematic review (9 studies; 64%), followed by weak altruism in three (21%), and "hypothetical" altruism in one (7%) study. Pure altruism was not associated with self-interest or benefit to kinship but was strongly associated with benefit to others and the medical staff as well as social exchange by contributing to scientific knowledge. Like pure altruism, weak altruism was not associated with expectation of personal benefit. However, weak altruism differed from pure altruism in expectation of benefits for family members and advancement of scientific knowledge. Reciprocal altruism demonstrated a moderate correlation with benefit to others and scientific knowledge but exhibited expectations of personal benefit as well as benefit to kinship. Unlike the other types of altruism, the existence of "hypothetical" altruism cannot be tested through experimental observation.

Discussion

This systematic review examined the motivations of study participants to accept or decline consent to cancer clinical trials and non-therapeutic biobank studies. Ten therapeutic clinical trials and four non-therapeutic biobank studies provided qualitative data regarding altruism derived from semi-structured interviews, questionnaires, or focus groups. Several common themes were identified as potential altruistic motivators including: medical benefit, hope, financial compensation, benefit for other patients or medical staff, kinship, and scientific knowledge (Figure 2). When arrayed according to an association map, four distinct subtypes of altruism could be defined according to participant expectations of personal benefit, benefit to family (kinship), benefit to others, and social exchange. These domains provide a generalizable framework to assess participant motivators which may bias study enrollment, disease severity, and likely duration of follow-up. Each of these consequences is particularly relevant to biomarker development studies given IRB restrictions and legal constraints which preclude participant access to research data acquired from non CLIA-approved sources.

Although altruistic behavior has been thoroughly investigated in the process of living donor kidney transplantation,[10] altruism has received comparatively little attention from the cancer research community. Previous studies [11] evaluating participation in therapeutic studies and tissue donation have focused primarily on external factors which may be modified to improve participation rates among cancer patients. As with the kidney donor chain, altruistic motivations may provide an opportunity to improve recruitment practices and prolong participation by cancer patients. Such considerations are

particularly critical to biomarker development projects that offer no immediate therapeutic benefit to participants or their families and depend entirely on voluntary, uncompensated effort among willing cancer patients.

At present, no standard framework exists to define or measure altruistic behaviors impacting therapeutic or nontherapeutic cancer research studies. This systematic review proposes an objective definition of altruism derived from broadly observed participant behaviors and clarifies existing ambiguous terminology using an association map. These data, which are international in scope, provide distinct definitions of pure and reciprocal altruism and simplify terms such as “weak” or “hypothetical” altruism that previously intersected concepts of social exchange.[9] As a result, the association map can be tested for its external validity across different populations of patients and cultures.

Altruistic behaviors among cancer patients appear to reflect their assessment of personal risk and overall prognosis. Study participants with low-stage cancer described the hope for a cure and desire to help future patients as their primary motivations, whereas patients with advanced-stage or unresectable malignancies were more likely to provide altruistic reasons[12] including their desire to help others as well as the investigator. This same pattern of behavior was observed among patients receiving adjuvant therapy versus palliative therapy.[5] Pure or weak altruism was most commonly observed in the case of tissue donation, as 75% of participants did not expect financial compensation for their effort.[13][14] At the opposite end of the risk spectrum, participants in phase I clinical trials,[15][16] and molecular/genetic research studies [17] exhibited reciprocal altruism as participation reflected the expectation of benefits to self and others.

The strength of these conclusions is limited by the qualitative nature of the underlying methodology as well as the small number of eligible studies. Structured interviews led to small sample sizes and subjective terminology. No meta-analysis could be conducted on these qualitative statements to determine the rate at which altruism impacts enrollment or the duration of study participation by eligible patients.

Conclusion

This systematic review provides ample peer-reviewed evidence that altruism motivates cancer patients to participate in clinical research studies regardless of therapeutic intent. Delayed recognition of altruism as a motivation among cancer patients may be caused by the therapeutic alliance between study and investigators overseeing therapeutic trials. Altruism may play an important, and as yet unquantified, role in longitudinal studies that provide no immediate benefit to participants, such as biomarker development. Strategies to harness altruism as a force for the good of all cancer patients may be just as transformative for validation of early detection markers as has been observed in the case of living donor kidney transplantation.

Declarations

Ethics approval and consent to participate: Not Applicable

Consent for publication: Not Applicable

Availability of data and materials: The authors confirm that the data supporting the findings of this study are available within the supplementary material and are openly available in PubMed, Cochrane, Embase and PsychINFO.

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Figures

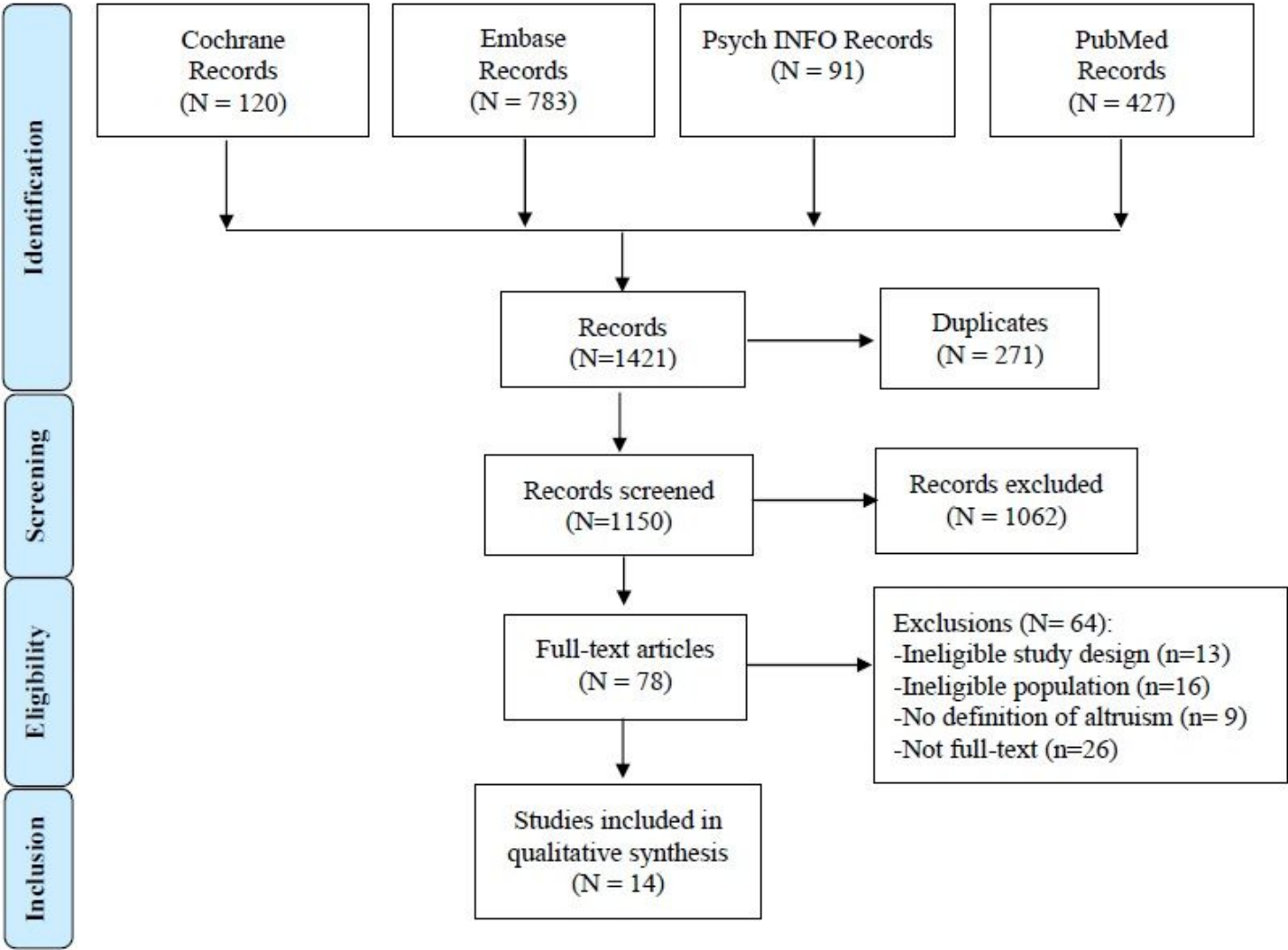


Figure 1

PRISMA Flowchart



Figure 2

Concepts related to altruism and willingness to participate in cancer research.

Supplementary Files

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- [AltruismReviewTables.pdf](#)
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