



Review

Mental Health and Well-Being of Solid Organ Transplant Donors. The Forgotten Sacrifices

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Abstract: In light of a global organ shortage, living donor transplantation has become increasingly relevant as an alternative to deceased donor transplantation. While current research has revolved around the medical aspects of transplantation, there remains a paucity of literature regarding the quality of life (QOL) of living donors. Hence, this review aims to provide a comprehensive outline of the current landscape of living liver and kidney transplantation, with a focus on the mental health and wellbeing of donors. As highlighted in previous studies, organ donation has a significant impact on both physical and mental aspects of donor wellbeing, with marked deteriorations occurring in the short term. Furthermore, other qualitative aspects such as financial burden contribute greatly to donor distress, reflecting a need for improved donor care. To address these pertinent issues, recommendations for a successful transplant program are detailed in this review, which encompasses psychological and social aspects of donor care throughout the donation process. Further research can be done on the impact of recipient deaths on donor QOL and appropriate interventions. Overall, given the selfless sacrifices of living donors, the care of their mental wellbeing is essential. Therefore, greater emphasis should be placed on the provision of adequate psychosocial support for them.

Keywords: living donors; mental health; quality of life; liver transplantation; kidney transplantation; patient care; program development; aftercare; psychosocial intervention; counseling



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1. Introduction

There is no organ without a donor. Since the first living donor kidney transplant (LDKT) in 1954 [1] and first living donor liver transplant (LDLT) in 1988 [2], the global prevalence of living donor transplants has increased rapidly, especially in Asia. Based on the 2015 annual report from the Global Observatory on Donation and Transplantation (GODT), 84,347 kidney transplants were performed with 41.8% from living donors while 27,759 liver transplants were performed with 21.0% from living donors [3]. While deceased donors have been the traditional source of organs in transplant in the West, the current

supply of deceased donor organs for transplant remains insufficient to meet the rising demand [4]. Current estimates suggest that up to 16,000 patients remain on the waiting list for liver transplants while only 6000 transplants are performed annually in the United States (US) [5]. In contrast to the West, living donor transplants remain the prevalent source of donor organs in Asia due to the lack of deceased organ donations. Cultural perspectives and societal values remain the main hurdles for deceased donor transplantation: e.g., the requirement for completeness of the body during funeral rites [6]. At present, LDLT constitutes more than 90.0% of total liver transplants in Asia [5] and more than 50.0% of kidney transplants are from living donors across the Philippines, Japan, South Korea, Singapore and Thailand [7].

2. Methods

The design of this study is a narrative review and detailed searches for relevant citations were conducted on PubMed and Google Scholar from inception to May 2021 using keywords including “donor”, “well-being”, “mental health”, and “quality of life” as well as related synonyms. In addition, references of included articles were screened to obtain any other relevant sources. The inclusion criteria were liver or kidney transplantation and living donor wellbeing. The scope of the review covers quality of life of adult living donors after liver or kidney transplantation with a comprehensive outline of elements of a successful wellbeing program targeted at this population.

3. Current Status of Living Donor Transplant

Over the last decade, living donor transplantation has become increasingly relevant as an alternative to deceased donor transplantation. In contrast to deceased donor organs, living donor organs are not restricted by donor mortality, allowing increased organ availability [8], transplantation to be performed on an elective basis and reducing waiting list mortality among transplant candidates [8,9]. In addition, LDLT allows for transplantation at a lower model for end-stage liver disease (MELD) score, shorter intensive care unit stay and consequently better post-transplant outcomes [10]. Similarly, increased graft and patient survival rates have been observed in LDKT as compared to deceased donor kidney transplantation (DDKT) [11]. LDLT has been postulated to confer immunological advantages over deceased donor liver transplantation (DDLTL) due to a reduction in inflammation and ischemia time, as well as genetic similarities with biologically related donors [12]. Evident in reduced rates of acute cellular rejection among LDLT recipients, this may suggest increased tolerance although the long-term outcomes after immunosuppression withdrawal are not well elucidated [13].

Despite the benefits of living donor transplantation over deceased donor transplantation, the former is not without its risks and is still a big undertaking for the donor who is otherwise healthy. Mortality of LDLT is 0.1–1% while that of LDKT is less than 0.03% [14,15]. To compound this further, practical considerations relating to implications on subsequent insurance coverage further creates undue stress that may deter potential donors [16].

The Living Donor Protection Act (LDPA) was recently introduced in the US to increase living donation rates [17]. Current estimates suggest a gradual upward trend for living donation in the US which peaked at 6867 LDKTs [18] and 524 LDLTs [19] in 2019. However, these donations still account for only a small proportion of total annual transplants [20]. Based on 2020 Organ Procurement Transplantation Network (OPTN) data, LDLT constitutes only 5.1% of annual liver transplantations in the US and only 30.5% of kidney transplants were from living donors [21]. Under the LDPA, insurance companies are prohibited from withholding insurance or practising discriminatory pricing against living organ donors [17]. This potentially addresses a crucial legislative gap in increasing the donor pool which will translate into decreased waitlist length and improved donor-recipient match rates.

4. The Impact of Organ Donation on Donors

While organ donors are investigated thoroughly to reduce post-operative complication as far as possible, there are still significant risks even to healthy donors. Infection is the most common post-operative complication affecting living donors [22,23], and 6.6% of LDLT donors were found to develop biliary complications such as bile leaks and strictures [14]. Moreover, it has been reported that up to 21.0% of donors complain of fatigue and pain [24], with marked deteriorations in physical quality of life (QOL) documented at three months [25–27]. Besides the inherently high risk of medical complications, the psychological strain accompanying living transplantation poses significant threats to donor wellbeing most significant at three months post-donation [25,28]. A total of 4.7–9.6% of donors suffer diminished mental QOL after transplant [28], which can often be exacerbated by recipient death, anxiety regarding recovery, insufficient medical care and financial difficulties with insurance claims [29,30].

In particular, recipient deaths can have devastating effects on donors' psychological wellbeing [26] with large decrements in mental health and vitality aspects of QOL scores [31]. In addition, a substantial increase in depression risk of 123% was reported among unrelated donors whose recipients died [32], of which 8% developed suicidal ideations [33]. The rapid psychological decline in donors could be attributed to guilt and feelings of responsibility [28]. Furthermore, the deceased recipients' families are less likely to treat donors with greater respect or gratitude during the grieving process [34], adding to the mental and emotional burden carried by donors.

5. Current Guidance on Donor Wellbeing

With increasing recognition of living donor well-being, several transplant societies have crafted recommendations on pre-donation assessment, surgical and post-donation care plans for living donors (Figure 1). The majority of the clinical guidelines recommend pre-transplant psychosocial assessment of potential donors to ensure psychological fitness and prevent coercion [35–40]. Similarly, most societies emphasize the importance of integrating donors into transplant care teams which serve as supportive networks [37,38,41]. Another key recommendation is to improve communication of physicians during pre-transplant workup to help donors set realistic expectations of graft success rates and make informed decisions [36,42,43]. Some guidelines further suggest for donors to be paired with advocate(s) who will promote their best interests [35,36,43] while others encourage financial counselling [35,36,38].

In terms of post-transplantation care, all guidelines encourage transplant centres to monitor donors' physical and psychological wellbeing [35–38,42]. Only the OPTN provided additional recommendations to monitor socioeconomic concerns of donor, who may face loss of income due to time needed to recover from their organ donations [34,35]. Other possible gaps in donor care include lack of recommendations on post-transplant physical rehabilitation which has been shown to aid in reconditioning while reducing fatigue [44,45], as well as insufficient psychological provisions for potential candidates who fail to donate due to clinical reasons or personal preferences. Lastly, there remains room for improvement to advocate for lifelong follow-up of donors, with most practices implementing two years follow-up duration [35,36] despite studies suggesting key complications arising many years post-transplant [35].

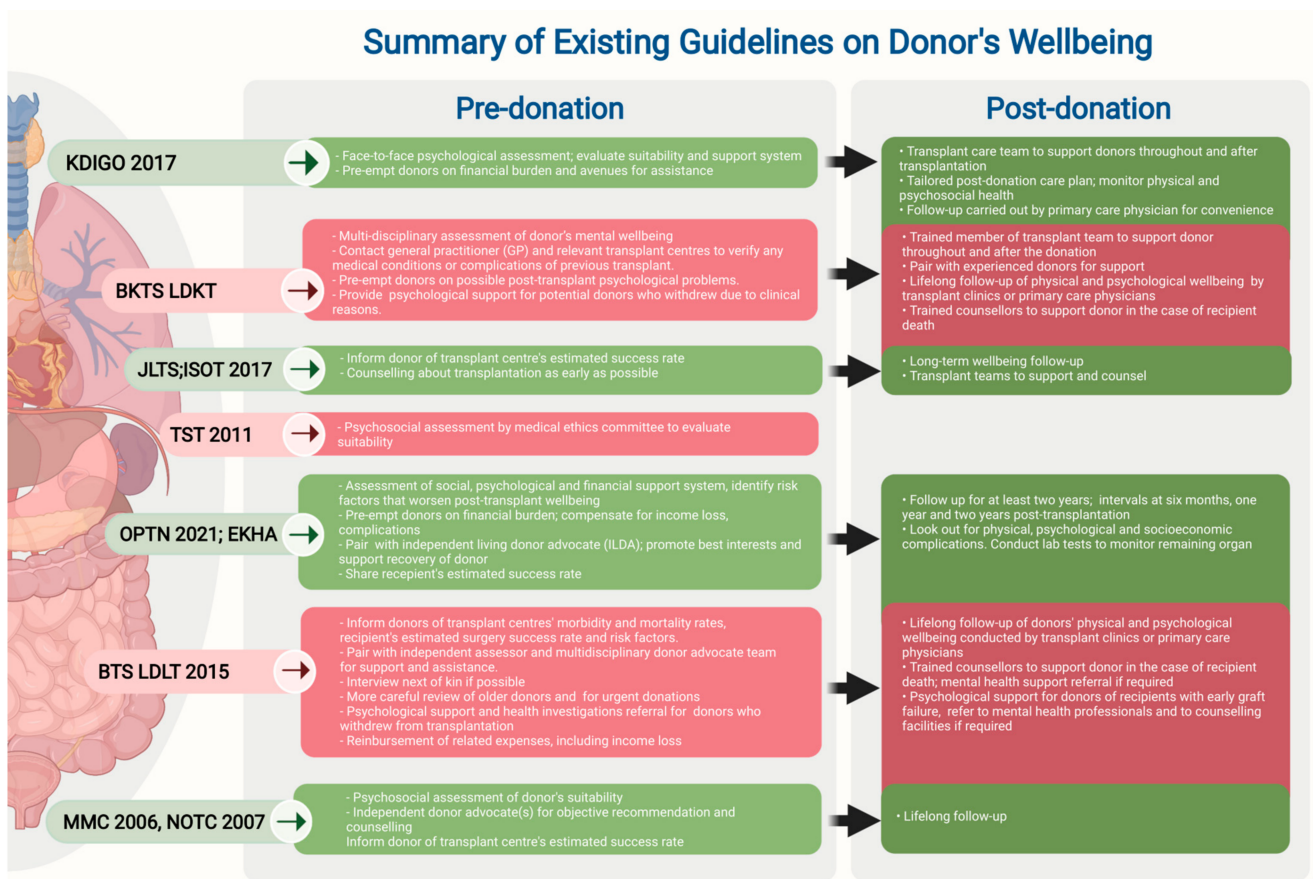


Figure 1. Summary of Existing Guidelines on Donor's Wellbeing.

6. Risk Factors for Adverse Mental Outcomes in Donors

At present, the two largest scale studies involving LDLT are the Adult-to-Adult Living Donor Liver Transplantation Cohort Studies, A2ALL [26] from 1998 to 2003 ($n = 819$) [46] and A2ALL-2 [28] from 2011 to 2014 ($n = 1871$) [47], involving nine transplant centres in North America. In the A2ALL consortium, 374 patients were monitored for up to 11 years using the short-form health surveys (SF-36) which revealed that health-related quality of life (HRQOL) for most living donors were not significantly affected by LDLT [26]. The only predictive variables for lowered physical and mental component scores were recipient death and lower educational attainment of donors. Likewise, the A2ALL-2 study demonstrated low rates of psychiatric episodes and higher self-esteem post-donation that continued over time, with 95% out of 271 donors reporting willingness to donate again. Both studies highlighted the low rates of physical and psychological complications in donors, but revealed greater need for psychological support in potentially vulnerable groups, such as bereavement counselling for donors whose recipients died [28] and pre-donation education and targeted post-donation care for donors with low educational attainment [26].

The Kidney Donor Outcomes Cohort (KDOC) study is a prospective study from 2011 to 2018 involving six transplant centres across the US, with 193 LDKT donors and 20 control subjects [48]. In contrast to LDLT donors, this study found that 16% of LDKT donors developed new onset anxiety, depression and anger, while 21% had increased worry about kidney injury or failure at one or more post-donation assessments up to two years. A significant proportion of LDKT donors (10%) developed low life satisfaction although 96% reported no regrets donating their kidneys at two years [48]. However, long term QOL assessment remains lacking, despite the fact that most non-surgical LDKT complications such as hypertension and diabetes only surface five years post-donation [49]. Therefore,

more prospective studies on longer term psychological effects of LDLT and LDKT donors are warranted.

7. Elements of a Successful Wellbeing Programme

7.1. Pre-Donation

Education. During decision making, many donors face issues recalling the vast amount of information shared [50] and thereby suffer mental fatigue [51]. A possible solution can be adapted from the tailored computer education intervention for LDKT recipients, “Your Path to Transplant”, where recipients receive personalised education according to their existing transplant knowledge and are involved in discussions to address their fears, barriers and readiness for transplantation [51]. Drawing inspiration from the success of this program, the implementation of a similar programme for both liver and kidney donors can help improve their understanding of the transplant process [52]. This prepares potential donors mentally, emotionally and financially [52], and empowers them to make better informed decisions, thus reducing post-transplant anxiety and distress. Importantly, pre-donation education and post-donation care should be better targeted at donors of varying socioeconomic groups and health literacy levels [26], considering that donors with low educational attainment tend to fare more poorly physically and psychologically [26]. For instance, existing materials on living donation are often pitched at freshman college reading level [53], however considerations should be made to adapt educational materials for individuals with lower health literacy [53] to protect their right to a robust transplant education and ensure the mental wellbeing of this vulnerable population.

Motivational interviewing (MI). Residual ambivalence, defined as lingering hesitancy after a donors’ agreement to donate [54], is often associated with poorer physical and psychological outcomes for donors [55]. Assessed using the seven-items Simmons ambivalence scale, ambivalence is observed in approximately 75% of donors before donation [54]. To reduce the adverse consequences of ambivalence, potential donors can be referred for MI which encourages candidates to verbalise their intentions for donation and make decisions that are aligned to their values [54]. By resolving ambivalence, donors will feel more committed and hence more in control of their decision [55]. Dew et al. noted that following MI, donors had fewer physical complications, less anxiety and were also able to recover more quickly post-donation [54].

Standardised psychosocial assessment tools. Currently, there are no psychological assessment tools that can be incorporated across all clinical guidelines [33]. Standardised psychosocial assessment tools should be established to streamline the assessment process and standardise the eligibility criteria for donors. For instance, the multidimensional ethical, legal, and psychosocial aspects of transplantation (ELPAT), living organ donor psychological assessment tool (EPAT) [33], and the nine-domains liver donor assessment tool (LDAT) [33] aim to cover multiple aspects of potential donors’ wellbeing to attain a holistic understanding of their psychosocial health. This allows the quantification of psychosocial risks beyond the standard low, moderate or high-risk classifications [33], facilitating better communication of risk profile of donors between transplant teams. Furthermore, with multi-dimensional assessments, areas where potential donors fare more poorly can be identified for early initiation of interventions to support candidacy [33].

Socioeconomic evaluation. Socioeconomic evaluation is an essential component of pre-transplant evaluation [35] due to the significant financial burden faced by donors [34] coupled with difficulties obtaining insurance [16]. There is a positive correlation between financial burden faced by donors and an increased risk of depression [56]. Therefore, counselling services by an integrated care team including a social worker should be provided to discuss appropriate support schemes, emphasizing the need for interprofessional collaboration and integration in promoting holistic patient-centred support [57].

7.2. Post-Donation

Follow-up. Post-transplantation programs should include lifelong medical follow-up of donors [36,37], facilitated by a donor registry which records donor complications and mortality [58]. During follow-up visits, donor screening should cover physical and mental aspects of health [38] as well as socioeconomic evaluation [35], allowing appropriate interventions to be implemented to maximise donor QOL.

Physical rehabilitation. Close monitoring of common physical symptoms such as fatigue and pain [24] are essential to preserve donor wellbeing, as prolonged recovery to baseline and frequent hospital visits are associated with poor HRQOL [59]. Deleterious effects of fatigue on psychological wellbeing are evident in increased likelihood of depressive symptoms and sleep disorders [60]. Similarly, poorly managed pain is known to have detrimental impacts on psychological outcomes [61], such as a two-fold increase in the risk of suicide mortality among individuals suffering from chronic pain [62]. In order to mitigate these risks among donors, physical screening should be conducted using the functional assessment of chronic illness therapy—fatigue subscale (FACIT-F), brief pain inventory (BPI) or physical component score (PCS) of the SF-36 [24], followed by physiotherapy which aids with fatigue [44], respiratory muscle tone [63] and immune function [45]. For pain management, epidural (levobupivacaine) or intravenous (morphine) analgesia may be used at controlled doses for acute pain during post-operative stay while pregabalin may be used to alleviate chronic pain [64]. Long-term pain management for donors further necessitates close collaboration between the anaesthesiologist and pharmacist for therapeutic drug monitoring. In addition, transplant centres may employ enhanced recovery after surgery (ERAS) interventions [65], a multidisciplinary and patient-centred approach including patient education, behavioural changes, diet modification and conservative treatment, to expedite donors' recovery process which promotes the physical and mental health of donors.

Psychological interventions. Psychological assessment of donors should include screenings for insomnia, depression, and anxiety which may arise from poor recipient outcomes [45] or socioeconomic stressors [66]. To facilitate psychiatric evaluation, the mental component score (MCS) of the SF-36 [67], the patient health questionnaire (PHQ-9) depression scale [68], the seven-item general anxiety disorder (GAD-7) scale [69] and the Pittsburgh sleep quality index (PSQI) [70] may be utilized. Post-screening, donors found to have depression may be followed up with cognitive behavioural therapy (CBT), acceptance and commitment therapy (ACT) or mindfulness-based cognitive therapy (MBCT). Based on the hypothesis that mental disorders are attributed to defective patterns of thought [71], CBT involves patients in collaborative problem-solving with their therapists to dispute such thought patterns, thereby reducing symptomatic depression and anxiety [72]. A recent meta-analysis conducted by Ferooshani et al. found that CBT conducted via computer platforms remain highly effective in treating depression [73]. Therefore, CBT may be administered virtually to living donors, potentially reducing inconvenience associated with repeated visits. In contrast to CBT, ACT and MBCT focus on improving patient relationship to psychological issues through acceptance and mindfulness respectively [74], thereby allowing for a gradual improvement in anxiety responses [75]. This strategy has proven to be highly effective in mitigating depressive symptoms, with the most pronounced improvement occurring after 3 months of therapy [76]. Other novel interventions such as the virtual reality exposure therapy (VRET) [77] and the progressive muscle relaxation (PMR) therapy [78] have also been shown to be efficacious in treating anxiety disorders and insomnia respectively [79,80]. In addition to psychiatric interventions, both psychosocial counselling and psychodynamic psychotherapy [81] are vital aspects of post-transplant donor care [82], especially for donors with poor recipient outcomes [28]. In the case of failed donation leading to recipient mortality, bereavement counselling services should be provided to improve donor outcome [83]. Besides donors of failed grafts, obese donors should also be closely monitored during counselling for issues pertaining to body image [48].

Peer mentoring programme. Potential donors should be paired with mentors as first-hand knowledge and personal encounters shared by previous donors have been reported to provide reassurance and emotional support [84]. This guidance and reassurance cannot be replicated by healthcare professionals who will only be able to share facts rather than experiences due to the lack of first-hand encounters as donors [85].

Financial Support. The implementation of a comprehensive transplant program for donors is dependent on the availability of financial resources. Therefore, long-term financial support sourced from various stakeholders [86] in addition to health grants and donor contributions are vital for institutions to acquire. Private centres may also seek to establish contracts with governmental institutions to enhance their donor care program [48]. Ideally, financial coverage for donors should include transport costs for follow-up visits [35], medical complications of transplantation [87] and other out-of-pocket expenses [88]. Given that donation-related financial costs contribute to post-transplant anxiety and distress for donors, the establishment of a reliable financial safety net is warranted to ensure transplant centres can manage donors' socioeconomic concerns and overall wellbeing.

7.3. Throughout Donation Process

Multidisciplinary team. Transplant teams are involved throughout the transplantation process and comprise of transplant surgeons, nephrologists or hepatologists, radiologists, anaesthesiologists, psychologists, transplant coordinators and transplant nurses [89]. A recent study by Rodrigue et al. has concluded that emotional instability, anxiety about health and poorer sense of fulfilment in life are correlated with worse post-donation psychological outcomes [48]. The selection process of medically and psychosocially fit donors will be improved through the involvement of members with varying expertise [52], thereby increasing the chances of favourable mental outcomes. Donors' mental wellbeing can be further improved with shorter hospital stays and enhanced patient satisfaction as a result of more effective communication within the transplant teams [89]. The importance of the familiarity and support provided by transplant teams is evident from a study which showed that 70% of donors preferred their transplant coordinators to continue with the follow-up rather than their own family doctor [90]. Thus, improved follow-up compliance will allow better monitoring of the long-term welfare and mental health of donors [90].

Independent Living Donor Advocate (ILDA). All donors should be assigned an ILDA who can advocate for their rights and safety [35]. The ILDA should be adequately trained and remain uninvolved in recipient matters. The role of the ILDA involves ensuring that donors are educated about the transplantation process, including evaluation, surgical procedure and follow-up. The inclusion of an ILDA in the donation process enhances the quality of care of potential donors and facilitates ethical decision making during difficult circumstances [91]. Consequently, removing the need for self-advocacy may provide assurance and relieve donors of additional worries to facilitate successful post-transplant recovery [92] (Figure 2).

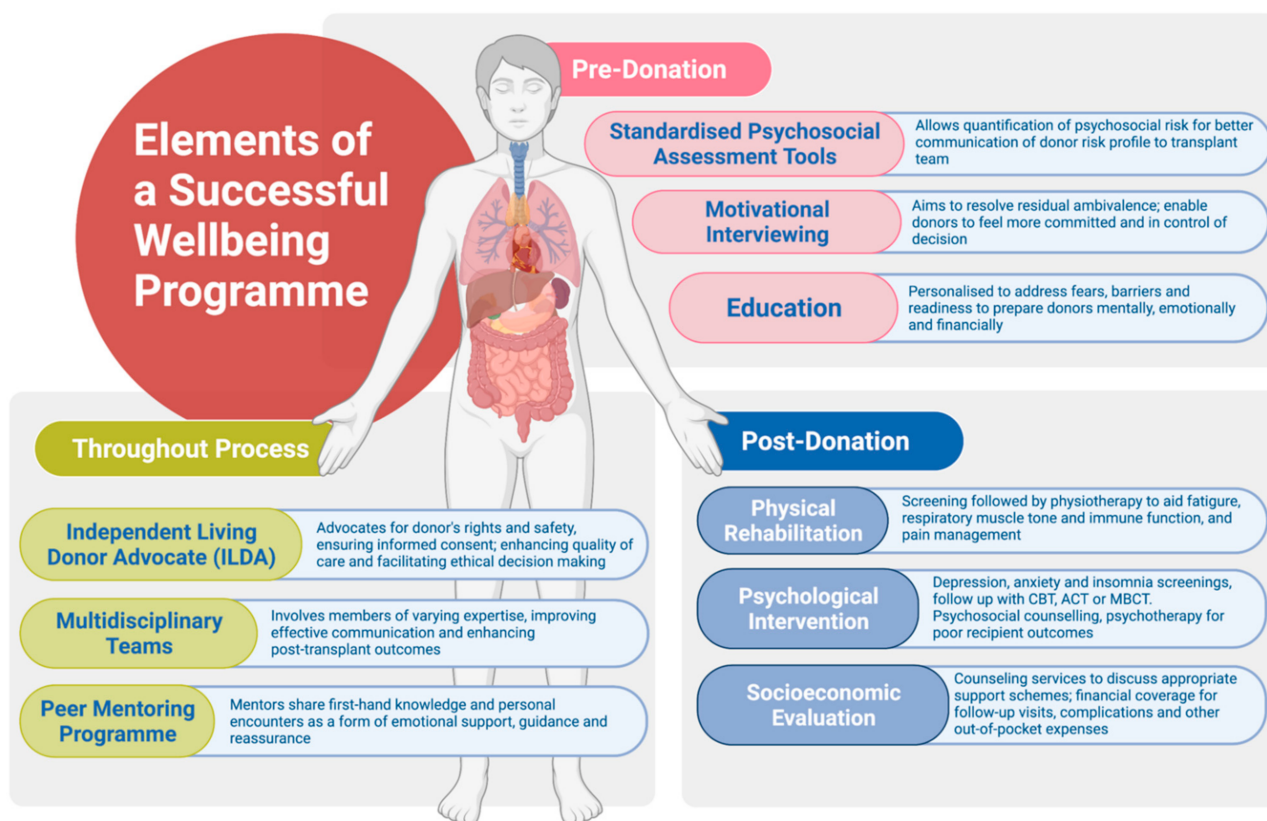


Figure 2. Elements of a Successful Wellbeing Programme.

8. Gaps for Future Research

Currently, the lack of literature on donor QOL fuels the need for further studies on this topic. One important aspect is the impact of recipient deaths on donors' mental health. The devastating effects on donors' physical recovery and psychological states [26] warrants further evaluations on the long-term psychological effects of recipient deaths on donors and validation of appropriate interventions for donors of failed grafts. Additionally, donors with pre-existing psychiatric disorders constitute another potentially vulnerable subpopulation. While some psychiatric patients qualify as potential donors, the lack of standardised guidelines on eligibility has led to considerable heterogeneity in donor evaluation [93], thus larger scale studies to validate donor criteria can be considered [94]. In other subgroups such as paediatric patients, organ transplantation is also considered the ideal treatment for children with end-stage liver or kidney disease [95,96]. Parent donors also face significant difficulties including financial constraints and caregiver burden which contribute to mental distress [97], highlighting the need for further improvements in the care of parent donors. While directed donations remain the most common source of living donor transplantations, an increasing acceptance of non-directed donations performed out of altruism [98,99] has raised controversies surrounding the psychological stability of these donors [98]. This provides grounds for future research to understand "pure altruism" among organ donors and their motivations [98].

9. Future Directions

Living donors will become increasingly relevant for transplants as we head into the next decade. While medical issues of donors are the prime focus of current research, the psychosocial needs of donors remain largely unexplored. Current gaps in the literature prevent comprehensive care of donors after transplant and more studies are required especially from underrepresented regions. For instance, living donors remain the predominate source of organs in Asia and Middle East. However, the stigmatisation of mental disorders in

these regions may misrepresent actual prevalence rates and warrants a careful approach of the topic. Importantly, a major gap of current literature lies in the systematic identification of high-risk donors after transplant and providing adequate support structure for these groups of patients, especially in the care of family donors with failed donations.

While the psychological stresses on donors post-transplant remain a true cause of concern, a subset of living donors report improved mental QOL after donation [100,101] benefitting from reduced caregiver burden, feelings of satisfaction due to active contribution to recipient treatment [102] and improved interpersonal relationships [34,102]. Interestingly, donors can also have positive perceptions of their surgical scars with some viewing their scars as a symbol of pride or awareness tool [103]. Nevertheless, the possible loss of anonymity proves problematic for living donors and remains an important issue to be addressed. Addressing these psychological impacts of transplantation is vital to optimize donor QOL and prevent the transplant community from losing advocates for living donation.

On the other hand, several protective factors predicting positive mental outcomes in living donors have been identified. For instance, the presence of social support has been shown to reduce ambivalence among donors [104] while donor resilience has been correlated with improved QOL post-transplant, due to reduced mental anxiety and a more favourable self-perception of well-being during evaluation [105]. This emphasises the importance of having pre-donation psychological assessment to improve mental outcomes of donors. Existing literature has also revealed that dispositional mindfulness and optimism may reduce symptoms of depression while promoting healthier cognition and emotional regulation in the wider population [106,107]. Similarly, spirituality and religion also serve as important sources of support to improve stress management [108]. These factors may reduce the emotional burden faced by living donors, although literature specific to the transplant donor population remains lacking. Thus, further studies are warranted to better understand the predictors of mental wellbeing among living donors.

To date, while many transplant societies have highlighted the importance of psychological assessment in donors, the pragmatic approach and lack of consensus on evaluation tools leaves much room for improvement. Here, we provide an overarching view of elements for consideration in transplant centres worldwide. Current research metrics also predominantly revolve around quantitative literature although there has been a call for an increase in qualitative literature in transplant [109]. While the perks of qualitative literature are beyond the scope of this review, several advantages include a deeper understanding of donor psychology, which sheds light on the factors contributing to reluctance to donate and poor psychosocial outcomes [109]. The utilization of these untapped tools could thus provide a better understanding of donors after transplant.

10. Conclusions

Our review has summarised the current landscape, donor impacts and society guidelines regarding living donor transplantations. The sacrifices of the donors are often untold and the current provision of support can be inadequate. The priceless sacrifices of donors should not be forgotten, and the care of their mental wellbeing should be of equal importance to the medical concerns throughout transplantation.

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