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REVIEW

Predonation psychosocial evaluation of living kidney and liver donor candidates: a systematic literature review

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Summary

Evaluating a person's suitability for living organ donation is crucial, consisting not only of a medical but also of a thorough psychosocial screening. We performed a systematic literature review of guidelines, consensus statements, and protocols on the content and process of psychosocial screening of living kidney and liver donor candidates. We searched PubMed, Embase, CINAHL, and PsycINFO until June 22, 2011, following the PRISMA guidelines, complemented by scrutinizing guidelines databases and references of identified publications. Thirty-four publications were identified, including seven guidelines, six consensus statements, and 21 protocols or programs. Guidelines and consensus statements were inconsistent and lacked concreteness for both their content and process, possibly explaining the observed variability in center-specific evaluation protocols and programs. Overall, recommended screening criteria are not evidence-based and an operational definition of the concept "psychosocial" is missing, causing heterogeneity in terminology. Variation also exists on methods used to psychosocially evaluate potential donors. The scientific basis of predonation psychosocial evaluation needs to be strengthened. There is a need for high-quality prospective psychosocial outcome studies in living donors, a uniform terminology to label psychosocial screening criteria, and validated instruments to identify risk factors.

Introduction

Although there are substantial benefits for living donor recipients (e.g., reduced waiting times, better survival) [1,2], the benefits of donating are less straightforward as this provides no direct physical benefit and may even carry certain peri- and postoperative risks for the donor's health and safety [3,4]. On the other hand, a donor might gain psychosocially from an increased self-esteem or a potentially improved relationship with the recipient [5,6]. Recent systematic reviews show that, once recovered from the immediate surgical effects, the donors' well-being is equal or even better when compared with the general population [5–7]. Yet, there is growing evidence that donors might also experience psychosocial difficulties postdonation, like depression (5–23%), anxiety (6–14%), stress (6–22%), and worries about health (6–50%) as reported in a systematic review [5]. In case of adverse recipient outcomes, single studies show that donors might also have feelings of waste (13%), guilt (5%), and even suicidal ideation (11%) [5].

Although these percentages are small, the burden of such events in otherwise healthy donors should not be underestimated and conflict with the nonmaleficence principle (Primum non nocere). Consequently, professionals always need to trade-off potentially positive and negative aspects of living donation by healthy persons. It is therefore clear that all efforts are needed to protect the donor from medical or psychosocial harm. A careful thorough predonation medical and psychosocial evaluation helps to balance the benefits and risks, and is indispensible to minimize undesirable outcomes postdonation.

An increasing number of medical evaluation protocols have been published, highlighting the importance of and growing consensus on the content of the predonation medical evaluation. Given the risk for adverse psychosocial outcomes [5], the transplant community agrees that, similar to the medical evaluation, the predonation psychosocial evaluation is also an essential component of the process to determine a person's suitability for donation. Despite this consensus, the format of this evaluation has been the subject of much debate, materialized in many different guidelines on the psychosocial evaluation of living organ donor candidates. However, no comprehensive systematic reviews exist on psychosocial screening processes in both living kidney and liver donor candidates including all types of relationships with the recipient. Kranenburg *et al.* [8] conducted a systematic review focusing solely on the psychosocial evaluation of living kidney donors donating to an anonymous or unspecified recipient. Tong *et al.* [9] focused primarily on the medical screening of living kidney donors and only briefly touched upon psychosocial screening.

We conducted a systematic review of published guidelines, consensus statements, and description of protocols or programs (see Table 1 for definitions) to identify the content and process of a psychosocial evaluation of living kidney and liver donor candidates.

Table 1. Definitions.

Type of document	Definition
Guidelines	Guidelines (also called clinical practice guidelines), as defined by the Institute of Medicine in 2011 [46], include recommendations intended to optimize patient care that are informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options
Consensus statements	According to the National Institutes of Health [47], consensus statements synthesize new information, largely from recent or ongoing medical research, that has implications for reevaluation of routine medical practices. Consensus statements are primarily based on the evidence-based or state-of-the-art knowledge of a representative group of experts
Clinical protocols	Clinical protocols are more detailed and provide specific instructions or algorithms for individual clinical decisions

Table 2. Detailed search string used in the electronic database PubMed*.

PubMed (565 results on June 22, 2011)
(living donors [MeSH terms] OR live donor OR living donation OR living donor OR living kidney donation OR living related kidney transplant* OR living donor kidney OR living unrelated kidney transplant* OR living liver donation OR living donor liver OR living related liver transplant* OR living unrelated liver transplant* OR Samaritan donor OR altruistic donor OR donor candidates) AND (screening OR assessment OR selection OR evaluation) AND (psych* OR mental OR social OR psychosocial OR smoking OR alcohol* OR substance abuse OR addiction OR depress*) AND ("humans"[MeSH Terms] NOT ((child OR adolescent OR infant) NOT adult))

*Similar search strings were used for the other electronic databases (available upon request).

Materials and methods

The methodology and results of this systematic review are reported in line with the preferred reporting items for systematic reviews and meta-analyses (PRISMA) guidelines [10].

Search strategy

We searched the databases PubMed, Embase (via EMBASE.com), PsycINFO (via OvidSP), and CINAHL (via EBSCO) until June 22, 2011, using search strings developed during iterative brainstorming sessions with the co-authors (see Table 2 for the PubMed search string), supplemented by screening the references from relevant studies, and by searching the National Guideline Clearinghouse, National Institute For Health And Clinical Excellence (NHS), Scottish Intercollegiate Guidelines Network (SIGN), and Trip database.

Inclusion and exclusion criteria

To be included, publications had to meet all the following criteria: (i) guideline, consensus statement/report or description of protocol/program; (ii) description of the content or process of the predonation psychosocial evaluation; and (iii) evaluation of living kidney or liver donor candidates (as the most common types of living organ donation).

Exclusion criteria were as follows: (i) quantitation of predonation psychosocial variables without embedding these in a screening protocol or procedure; (ii) written in a language none of the research team understood (i.e., languages

other than English, French, German, or Dutch); and (iii) full text could not be found.

Study selection

Two researchers (ND and FD) independently screened all titles and abstracts for eligibility, followed by a full text analysis of potentially relevant abstracts, using EndNote®X2 software (Thomson Reuters, New York, NY, USA).

Data extraction

The following data were extracted if reported: first author, publication year, setting, living organ type (i.e., kidney or liver), type of living donor–recipient relationship and its definition, name of guideline/consensus statement/protocol, the content (i.e., psychosocial screening criteria) and their evidence base, and all process-related information (e.g., for whom? how? when? where? by whom? presence of third parties? cooling-off period?). In case of multiple publications on the same program or protocol, data were extracted from the most recent report only. One reviewer extracted data (ND or LT), which was checked by a second reviewer (FD) for accuracy and completeness.

Results

Study selection

Thirty-four papers are included (Fig. 1), consisting of seven guidelines (20.6%), six consensus statements or conference reports (17.6%), and 21 papers describing a living donor evaluation protocol or program (61.8%).

Papers were published between 1995 and 2011, of which 23 originated from North America (67.6%), seven from Europe (20.6%), two from Australia (5.9%), and two from Asia (5.9%) (Table 3). Seventeen papers focused on living kidney (50.0%), eight on living liver (23.5%), four on both living kidney and liver donation (11.8%), and five did not specify organ type (14.7%). Seventeen papers (50%) did not specify for which donor–recipient relationship the guideline or protocol was intended [6,11–26]. Six [27–32] of these did not define this relationship.

Content of the psychosocial evaluation

Type of factors being considered

Across 34 publications, 197 different psychosocial factors were identified that can be clustered into 42 psychosocial domains, ordered from most frequently to least frequently reported (Table 4). The screen procedures could be divided into initial simple screenings and extensive psychosocial evaluations. In case an initial screening is taking place before an extensive one, most frequently addressed factors were motivation to donate, social history, expectations about donation, basic knowledge about the risks involved in donation, relationship with recipient, and mental or emotional disorders.

Definition of psychosocial criteria

The broad spectrum of psychosocial domains observed suggests that a clear definition or taxonomy of what "psychosocial evaluation" entails is missing, making it unclear if certain behavioral factors need to be addressed during the psychosocial or medical evaluation. For instance, Rudow and Brown [20] and Gentil Govantes and Pereira Palomo [13] addressed behaviors like alcohol and drug use as well as sexual promiscuity, homosexuality, prostitution, incarceration, or having tattoos or body piercing as part of the medical screening as some of these might contain a potential risk of infectious disease transmission or postsurgical complications in general [27,33,34].

There was also much heterogeneity in terminology used (e.g., psychological well-being, psychosocial stability, psychopathology) and in the level of detail provided in defining each criterion: some authors only addressed broad "umbrella" terms, like psychiatric disorders [13,29,33], whereas others specified these (e.g., mood disorders (depression, anxiety), personality disorder (schizophrenia, borderline)). Moreover, some authors just listed factors without any clarification, whereas others provided detailed descriptions, together with examples from clinical practice [21,30]. For example, Leo *et al.* [30] explained why employment status is important, as employers are a principal source of economic support by providing sick leave or vacation time during postsurgical recovery.

Evidence base

Most factors were not supported by evidence or were at least not referenced, making it unclear if they indeed predict poor outcomes in donor candidates. Authors publishing their center's protocol often refer to other guidelines or consensus statements, without explicitly listing all their center's psychosocial factors. For example, Mark *et al.* [35] referred to the Live Organ Donor Consensus Group [36] and the National Conference on the Non-directed Live Organ Donor [37], but did not present which of the factors outlined in these publications are addressed within their own evaluation.

Psychosocial contraindications

Contraindications for donation were specifically stipulated in 18 papers (52.9%) [15,19,20,23,25–30,32,34,35,37–41], of which only three indicated whether these were absolute or relative contraindications [19,25,26], and only one paper indicated that these were evidence-based [27]. Contraindications most frequently reported were as follows:

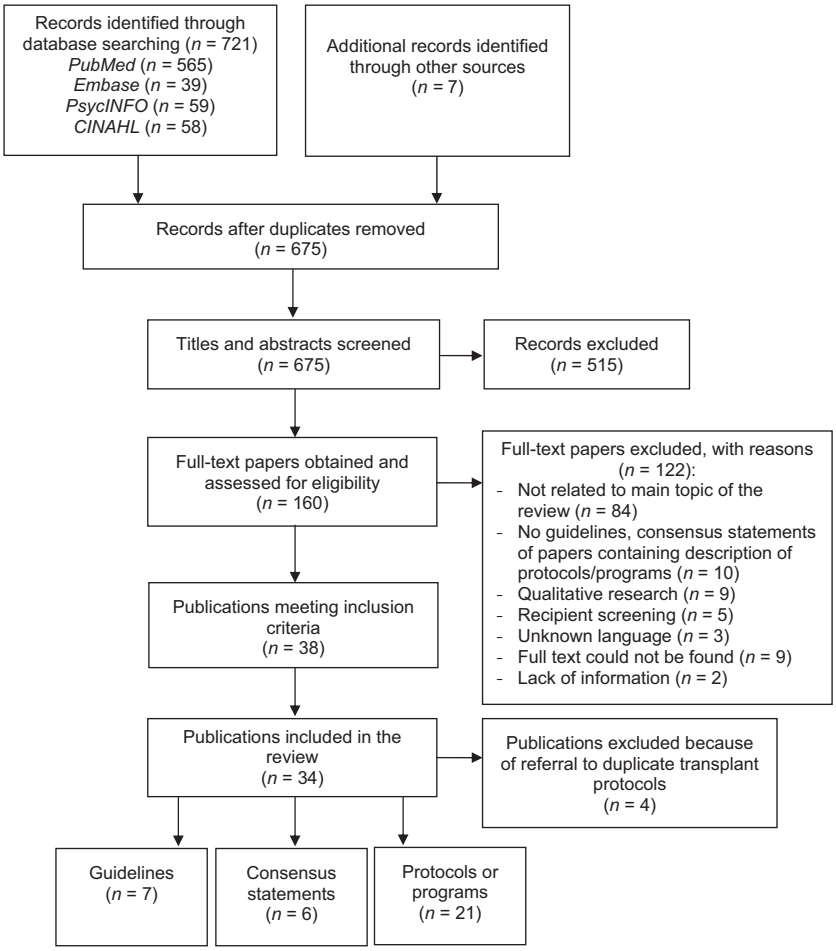

Figure 1 Flow chart of the study selection process.

motivation-related factors, some kind of coercion or pressure to donate, current or past psychiatric disorders, ambivalence, and unrealistic expectations. The level of detail of what these contraindications entail is again very heterogeneous. Some stated that contraindications to unspecified donation are the same as for other donation types, whereas Dew *et al.* [27] suggested additional contraindications for "unrelated donors." Jacobs *et al.* [40] proposed different contraindications for the initial screening than for the more detailed evaluation. Some state that the presence of risk factors does not necessarily rule out donation, but that the goal of an evaluation is to identify areas for additional support or therapeutic interventions to optimize outcomes [6,13,21,30,36].

Process of psychosocial evaluation

For whom is psychosocial evaluation necessary?

Nineteen papers (55.9%) did not specify which candidates need to undergo psychosocial evaluation [6,11,15,16,21–26,28–33,37,38,42]. Other papers widely differed whether all [12–14,17,18,20,34,36,39,41,43] or specific subgroups need to be screened (e.g., anonymous donors) [19,27,35,40]. Eleven out of these 15 papers (73.3%) recommended to screen all potential donors, yet, given that they focused on a specific donor–recipient relationship, it remained unclear whether they really meant all candidates (i.e., irrespective of their relationship with the recipient). Zhao *et al.* [41], for example, recommended to evaluate all donor candidates, yet, they only describe donation between relatives. Of note, the group of Ben-Haim [38] reported that screening is also necessary in case of urgent transplantation.

How should psychosocial evaluation be performed?

There was agreement among nine papers (26.5%) that the evaluation should take place in two phases, i.e., an initial (often combined with medical screening questions and providing information about the donation process) and a more extensive evaluation [13,27,29,34,35,37–40]. Some

Table 3. Description of the included papers.

Author, year published (setting)	Organ type	Type of donor–recipient relationship	Definition provided	Name of guideline, consensus statement or protocol/program	Evidence base
Guidelines					
Delmonico *et al.* 2007 [39] (USA)	Kidney	Related and unrelated	Related = having at least some HLA identity with the recipient (genetically related), or having emotional bonds forged in marriage or friendship (emotionally related) Unrelated = individuals who have neither a genetic or longstanding emotional relationship with the transplant recipient (e.g., who come forward through internet solicitation and other public appeals) (also called nondirected)	Not specified	Literature review
Dew *et al.* 2007[6] (USA)	Not specified	Not specified	Not specified	Not specified	Literature review
Gentil Govantes *et al.* 2011 [13] (Spain)	Kidney	Not specified	Not specified	Not specified	Consensus statement of the Amsterdam Forum on the Care of the Live Kidney donor (2004) [42] and the CARI guidelines (2010) [14]
van Hardeveld *et al.* 2010 [14] (Australia)	Kidney	Not specified	Not specified	CARI guidelines. Psychosocial care of living kidney donors	Literature review, Level III and IV evidence
Kasiske *et al.* 1996 [15] (USA)	Kidney	Not specified	Not specified	The evaluation of living renal transplant donors: clinical practice guidelines	Literature using MEDLINE, bibliographies in pertinent publications, personal experiences/opinions Draft versions were reviewed by the Ad Hoc Clinical Practice Guidelines Subcommittee of the Patient Care and Education Committee and the Board Directors of the American Society of Transplant Physicians

Table 3. continued

Author, year published (setting)	Organ type	Type of donor–recipient relationship	Definition provided	Name of guideline, consensus statement or protocol/program	Evidence base
Leo *et al.* 2003 [30] (USA)	Kidney	Unrelated	Not specified	Not specified	Literature, cases from own clinical experience, the interview guideline has been adapted from the Structured Interview for Renal Transplantation, which is used to determine the psychological appropriateness of renal transplant recipients [48]
Schroder *et al.* 2008 [21](USA)	Not specified	Not specified	Not specified	Not specified	Literature review
Consensus statements or conference reports					
Abecassis *et al.* 2000 [36] (USA)	Kidney, liver, (pancreas, intestine, lung)	Directed + nondirected	Directed donation = donation to an identified recipient Nondirected donation= donation to a candidate unknown to the potential donor (also referred to as a Good Samaritan donor)	Consensus statement on the Live Organ Donor	Consensus
Adams *et al.* 2002 [37] (USA)	Kidney	Nondirected	Donation to a complete stranger, no specification of an intended recipient or no direction for the selection	The nondirected live kidney donor: Ethical considerations and practice guidelines	National expert opinion, clinical experience, open discussion
Barr *et al.* 2006 [11] (Canada)	Liver	Not specified	Not specified	A Report of the Vancouver Forum on the Care of the Live Organ Donor: Lung, Liver, Pancreas, and Intestine: Data and Medical Guidelines	Not specified
Canadian Council for Donation and Transplantation [12] (Canada)	Kidney, liver, (lung)	Not specified	Not specified	Enhancing living donation: A Canadian Forum: Report and Recommendations	Experts opinion, literature review, existing recommendations, current Canadian and international practice, discussion

Table 3. continued

Author, year published (setting)	Organ type	Type of donor–recipient relationship	Definition provided	Name of guideline, consensus statement or protocol/program	Evidence base
Dew *et al.* 2007 [27] (USA)	Kidney	Unrelated	Not specified	Guidelines for the Psychosocial Evaluation of Living Unrelated Kidney Donors in the United States	Experience of experts in the field of the North American transplant community that met during a conference meeting, existing recommendations, evidence base in genetically and emotionally related donors
Ethics Committee of the Transplantation Society, 2004 [42] (Canada)	Kidney	Not specified	Donation to a potential recipient (known by the potential donor or not known in the circumstance of anonymous donation)	The Consensus Statement of the Amsterdam Forum on the Care of the Live Kidney donor	International experience of professionals and evidence -based recommendations
Protocols or programs					
Ben-Haim *et al.* 2005 [38] (Israël)	Liver	Significant long -term relations with recipient, first or second degree familial relatives	Significant long-term relations with recipient, first or second degree familial relatives	Not specified	Inclusion and exclusion criteria and phases of evaluation followed recently published recommendations, algorithm is based on lessons learned from their experience
Erim *et al.* 2010 [34] (Germany)	Liver	Family members/persons who have obvious close relationships with the recipient	Family members/persons who have obvious close relationships with the recipient	Not specified	Literature review on predictors facilitating a favorable psychosocial outcome
Fisher, 2003 [28] (USA)	Kidney	Related + unrelated	Not specified	Not specified	Literature review, guidelines from an ad hoc clinical practice guidelines subcommittee of the patient care and education committee of the American Society of Transplant Physicians developed in 1996

Table 3. continued

Author, year published (setting)	Organ type	Type of donor–recipient relationship	Definition provided	Name of guideline, consensus statement or protocol/program	Evidence base
Gilbert *et al.* 2005 [29] (USA)	Kidney	Altruistic nondirected	Not specified	Not specified	Not specified
Jacobs *et al.* 2003 [40] (USA)	Kidney	Nondirected	Volunteers who offer to donate to anyone waiting on the waiting list	Not specified	Clinical experiences
Lopes *et al.* 2011 [16] (Portugal)	Kidney	Not specified	Not specified	Not specified	Not specified
Mark *et al.* 2006 [35] (USA)	Kidney	Nondirected	Donation of a kidney to a stranger	The organ procurement organization-based nondirected living kidney donation program	Consensus statements [36,37]
O'Dell *et al.* 2003 [17] (Canada)	Kidney, liver, (lung)	Not specified	Not specified	Not specified	Literature (both in living donors and transplant recipients), consensus statement of Abecassis *et al.* [36]
Olbrisch *et al.* 2001 [33] (USA)	Kidney, liver, (lung)	Genetically and emotionally related donors, Good Samaritan Donors (directed), Good Samaritan Donors (Nondirected)	Genetically related donors: genetical relationship Emotionally related donors: a relationship that has been built on reciprocal giving, relationships based on personal commitment to another person, love, affection, mutual interests Good Samaritan donors (directed): a distant or no relationship with a specific recipient Good Samaritan donors (nondirected): someone who wishes to donate an organ to be used by any recipient who needs it, without knowledge of the recipient's need or distress	Not specified	Clinical experience, transplant team interactions, literature
Papachristou *et al.* 2010 [18] (Germany)	Liver	Not specified	Not specified	Not specified	Clinical experience, literature, consensus statement of Abecassis *et al.* [36]
Potts *et al.* 2009 [19] (UK)	Not specified	Not specified	Not specified	Not specified	Not specified

Table 3. continued

Author, year published (setting)	Organ type	Type of donor–recipient relationship	Definition provided	Name of guideline, consensus statement or protocol/program	Evidence base
Reichman *et al.* 2010 [31] (Canada)	Liver	Anonymous directed and nondirected	Not specified	Not specified	Not specified
Renz *et al.* 1995 [32] (USA)	Liver	Related	Not specified	Not specified	Not specified
Rudow *et al.* 2003 [20] (USA)	Kidney	Not specified	Not specified	Not specified	Not specified
Shrestha *et al.* 2003 [22] (USA)	Liver	Not specified	Not specified	Not specified	Not specified
Sites *et al.*, 2008 [23] (USA)	Not specified	Not specified	Not specified	Not specified	Not specified
Smith *et al.* 2004 [24] (Australia)	Kidney	Not specified	Not specified	Not specified	Not specified
Stagno *et al.* 2007 [25] (Switzerland)	Not specified	Not specified	Not specified	Not specified	Not specified
Sterner *et al.* 2006 [43] (USA)	Kidney	Related (the recipients are always children, as this protocol is described and used by The Children's Hospital of Philadelphia)	Not specified	Not specified	Literature reviews, clinical experience of social worker with donor and recipient families, and recommendations in published consensus statements
Walter *et al.* Med Sci Monit, 2005 [26] (Germany)	Liver	Not specified	Not specified	Not specified	Not specified
Zhao *et al.* 2010 [41] (China)	Kidney	Related	Relative	Not specified	Not specified

Table 4. Psychosocial domains and factors covered by the guidelines, consensus statements, and protocols.

Psychosocial domains	Range of psychosocial factors to be addressed in evaluation of donors as reported in the included papers	*n* (%)
Motivation-related factors	Motivation/reasons for donation; Embedment of the donation into a meaningful context; A logic rationale for donation that is understandable for the team; Guilt; Ulterior motives (potential benefits, expectations, or perceived obligations on the part of either the donor or the recipient, to atone or gain approval, to stabilize self-image, media attention, to remedy psychological malady, to develop a personal relationship, desire for recognition, financial benefits, avoidance of military duty)	25 (73.5)
Some kind of coercion or pressure to donate	Coercion; Family pressures; Vulnerability to coercion/pressure; Level of autonomy; Risk for exploitation (by others for monetary or other personal gain); Financial inducements; Organ trade	23 (67.6)
Any kind of support before and after donation	Social support; Emotional support; Available psychological support after donation; Practical support; Available practical support after donation during recovery; Financial support; Tangible support; Physical support; Support networks; Significant relationships	22 (64.7)
Donor–recipient relationship	Relationship (if any) between donor and recipient; Nature of the relationship (strengths, past conflicts/difficulties); Subordinate relationship between donor and recipient (e.g., employer – employee); Donor–recipient interaction; Dynamics of the relationship between donor and recipient; Emotional quality of the relationship	20 (58.8)
Current or past psychiatric disorders	Specified: Substance abuse; Mood disorders (depressive or bipolar disorder); Anxiety disorder, panic, or needle phobias; Personality disorder (e.g., paranoid, schizophrenia, borderline, narcissistic, narcissistic self-organization, and self-regulation); Suicidality or self-harm; Eating disorders; Orientation issues, thought processing, thought disturbances (hallucinations, delusional thinking, or illusions); Other serious disorders (low self-image, body image disorder)	17 (50.0)
	Unspecified	11 (32.4)
Competence	Competence; Ability to solve conflicts; Ability to develop a realistic and logical plan for donation;Decision-making capabilities; Competence to comprehend information and to give informed consent for donation	16 (47.1)
Financial issues	Financial status; Availability of resources to cover (un)expected donation-related expenses; Ability to deal with the economic implications that may arise throughout the donation process; Status as a sole wage earner (may be relative contraindication for donation); Availability of disability and health insurance; ability of the donor to subsequently obtain life insurance without additional cost; Financial hardship imposed on the donor and family as a results of the donation (including lost wages, out-of-pocket travel, inability to obtain sick leave, and lack of job security); Potential economic risks associated with donation; Potential hardships for the donor and his or her family because of donation	16 (47.1)
Coping-related issues	Coping; Coping strategies/mechanisms/styles/behavior; Illness-coping strategies; Former psychological coping; Current psychological coping (with which coping styles does the candidate react to the operation); Ability of potential donor (and family) to cope effectively with stresses associated with transplantation (before and after donation); Nature of coping skills to manage current or past life- or health-related stressors; Coping with previous difficult life events; Emotional resources to cope with stressors related to the donation process; Ability to cope with adverse outcomes for recipients; Coping with pain after the transplant	15 (44.1)
Employment-related issues	Employment status; The interaction with the donor's employer; Potential occupational risks or implications for donor's current job and their future employability; Work- and/or school-related issues (arrangements with employer or school; financial resources); Able to withstand time away from work or established role, including unplanned extended recovery time	15 (44.1)
Family-related issues	Family context and relationships; Family dynamics and organization; Temporary change (limitations) in the donor's role within a family; Health issues of other family members; History of family's mental health issues; The necessity of making alternative arrangements for child care when the donor is the primary care provider; Outside assistance required when the transplant is between spouses; Feelings, perspectives, or reactions of family members or another significant about donation and the donation decision of the donor; The degree to which potential donors have discussed the plan for donation with their own significant family members	14 (41.2)

Table 4. continued

Psychosocial domains	Range of psychosocial factors to be addressed in evaluation of donors as reported in the included papers	*n* (%)
Ambivalence; resoluteness regarding the decision of donation		13 (38.2)
Socio-demographic characteristics	Socio-demographic characteristics; Race or ethnicity; Educational level; Social situation or history; Living situation or arrangements	13 (38.2)
Psychological status	Psychological functioning; Psychological stability; Psychological well-being; Psychological fitness; Psychological complaints	13 (38.2)
Decision-making process (how the decision to donate was made)		11 (32.4)
(Unrealistic) Expectations (e.g., about the process, health expectations for the recipient, expectations regarding the effect of the donation on the relationship with the recipient)		11 (32.4)
Comprehension/knowledge/ awareness/understanding of the recipient process (including risks, benefits, health outcomes, recovery process, …)		11 (32.4)
Cognitive status	Cognitive status; Learning disability or other cognitive impairments; Intelligence level	10 (29.4)
Values, (religious) beliefs, sense of charity, and community/community activities		9 (26.5)
Memory (short-term, remote, and long-term)		8 (23.5)
Health behavior*	Life style; Regular physical activities; Weight/obesity; Substance use; Compliance (medication compliance, nonattendance at appointments)	8 (23.5)
Current stressors (e.g., relationships, home, work, financial, health) or stress level		7 (20.6)
Altruism	Altruism; History of altruistic acts; History of volunteerism or charitable deeds; Voluntariness	6 (17.6)
Marital situation	Marital status; Stability of marriage/relationships; Marital stress	6 (17.6)
Current or past use of therapeutic interventions (counseling, medication)		5 (14.7)
Legal issues	Legal situation; Legal history; Legal offense history and citizenship, incarceration or imprisonment	4 (11.8)
Comprehension/knowledge/ awareness/understanding of the recipients' illness or availability of alternative treatments for the TX candidate		4 (11.8)
Victim of physical, psychological, or sexual abuse		3 (8.8)

Table 4. continued

Psychosocial domains	Range of psychosocial factors to be addressed in evaluation of donors as reported in the included papers	*n* (%)
Potential medical risks and urgency of donation		3 (8.8)
Physical or somatic functioning/ complaints		3 (8.8)
(Health-related) quality of life		3 (8.8)
Chronic pain management		2 (5.9)
Recent or significant losses		2 (5.9)
Concerns (e.g., health concerns during and after donation)		2 (5.9)
Attitude regarding donation		2 (5.9)
Cultural background		2 (5.9)
Sexual behaviors*	Sexual promiscuity; Unprotected sex; Homosexual behavior; Prostitution	2 (5.9)
Tattoos and body piercing*		2 (5.9)
Understanding, acceptance, and respect for the specific donor protocol, e.g., willingness to accept potential lack of communication from the recipient, willingness to undergo future donor follow-up		1 (2.9)
Willingness to maintain confidentiality of patient information		1 (2.9)
Self-efficacy, optimism, pessimism		1 (2.9)
Recuperation plan		1 (2.9)
Daily functions		1 (2.9)

*****Factors mostly covered by the medical evaluation.

indicated that psychosocial questions need to be integrated in the initial screening to rule out persons with obvious contraindications, such as poor motivation, unrealistic expectations about donation, or severe mental illnesses [13,37,40].

For the more extensive evaluation phase, 14 papers (41.2%) recommended using an interview, either a standardized structured one [5/14 (35.7%)], which might also be helpful to retrieve comparable information from a relative [28], or a semi-structured format [12,14,18,24,26,30,34,37] [8/14 (57.1%)], providing a framework for comprehensive assessment, but allowing room for flexibility [30]. Only one paper (7.1%) preferred an open dialog using an unstructured interview [29].

Ten papers (29.4%) proposed additional psychometric testing [18,22,24,26,28,29,34,40,41,43], although one paper did not specify which tools should be used [29]. Table 5 shows that there is quite some variability on type, number, and content of instruments.

With regard to record keeping, O'Dell and Wright [17] were the only ones recommending using an electronic assessment tool, providing a time-saving, efficient, and standardized method of information gathering.

When should psychosocial evaluation be performed?

There is no agreement on the timing of the evaluation. Eighteen papers (52.9%) did not specify an exact time point [6,12,14,16,17,21,23,25,28,30,31,33,35–39,42], whereas some others presented a detailed algorithm with all sequential steps of the evaluation [15,43]. Most authors, however, recommended that the psychosocial evaluation should take place after a minimum set of medical tests (e.g., laboratory tests, viral studies) [11,15,20,40], but early in the process, to avoid invasive and expensive medical tests if clear psychosocial contraindications are present [11,13,15,19,20,22,24,26,27,32,40,41]. Nine percent state that it can also depend on the situation, e.g., characteristics of the donor (fear, emotional instability), a hospital's facilities, or the urgency of the procedure depending on the recipient's health [13,15,18]. The contact frequency was never documented.

Where should psychosocial evaluation take place?

The majority (82%) did not specify the location. Others recommended following options: in the center where donor surgery will take place (5.9%) [27,29], at the hospital's psychosocial unit (5.9%) [33,34], in the transplant center (2.9%) [40], or at the center of choice (2.9%) [35]. Six

Table 5. Psychometric instruments.

Psychometric instruments	Concepts measured
Berlin Mood Questionnaire (BMQ) [18,22,26]	Psychological well-being
Giessen Complaint Questionnaire (GBB) [18,22,26]	Physical complaints
36-Item Short Form Health Survey Evaluation (SF-36) [22,24]	Quality of life (physical and psychosocial functioning)
Anamnestic Comparative Self-Assessment scale (ACSA) [18,22]	Quality of life
(Modified) Beck depression Inventory (BDI/mBDI) [22,41]	Depressive symptoms
Minnesota Multiphasic Personality Inventory (MMPI) [22,40]	Personality traits
Narcicissm Inventory (NI) [18,26]	Narcissistic self-organization and self-regulation
Symptom checklist-90-Revised (SCL-90-R) [22,43]	Psychosomatic complaints
Transplant Evaluation Rating Scale (TERS) [24,34]	Past and present psychiatric symptoms and personality, compliance, coping behavior, and social support (as in Smith *et al.* (2004)) [24] Mental stability and social functioning (as in Erim *et al.* (2010)) [34]
22-item questionnaire developed by the TX center (unpublished) [41]	Unknown
Addiction Severity Index (ASI) [28]	Substance abuse problems
Alltagsfragebogen (ALL) [18]	Daily functions
Brief Mental Status Exam (MSE) [28]	Mental status, cognitive functioning
COPE (COPE-28) [18]	Coping behavior
Drug Abuse Screening Tool (DAST) [28]	Substance abuse
Freiburg Illness-Coping Questionnaire (FKV) [18]	Illness-coping strategies
Generalized Anxiety Disorder Questionnaire (GAD 7) [18]	Anxiety
Hopkins Symptom Checklist [22]	Anxiety and depression symptoms
Medical Outcomes Survey (MOS) Social Support Survey [43]	Different types of social support and positive social interactions
Michigan Alcohol Screen Tool (MAST) [28]	Social, vocational, and family problems frequently associated with heavy drinking
Quality of Life Questionnaire (WHOQoL BREF) [18]	Health-related quality of life
Patient Health Questionnaire (PHQ/PHQ-15) [18,24]	Depression, panic, psychosocial functioning [as in Papachristou *et al.* (2010)] [18] Somatic complaints, depression, anxiety, eating disorders, alcohol use) [as in Smith *et al.* (2010)] [24]
Perceived Available Support from the Berlin Social Support Scale (PAS) [18]	Social support
Perceived Stress Questionnaire (PSQ) [18]	Subjective stress (stressors and stress reactions)
Questionnaire on Self-Efficacy, Optimism, and Pessimism/ Selbstwirksamkeit Optimismus, Pessimismus (SWOP) [18,22]	Self-efficacy, optimism, pessimism
Self-rating anxiety scale [41]	Anxiety
Wechsler Adult Intelligence Scale (WAIS) [41]	Intelligence

papers (17.6%) reported that the initial screening can be done by telephone [27,29,35,37,39,40], especially for donor candidates living far away [35].

Who should perform the psychosocial evaluation?

In the 27 papers (79.4%) documenting who should perform the evaluation, there was considerable agreement among 14 papers (51.9%) that this person should be a healthcare professional or a team not involved in the recipient's care, and thus allowing independent decision-making [12,17,20,22–24,27,29,34,36,39–41,43], including social workers (59.3%), psychiatrists (59.3%), (external) psychologists (57.1%), psychiatric nurses/nurse specialists (14.8%), physicians (7.4%), or other specialists in psychosomatic medicine (3.7%). Also, organ procurement organization (OPO) coordinators (7.4%) [29,35] and transplant coordinators (3.7%) [40] are sometimes entitled to perform an initial screening. Abecassis *et al.* [36] added that when a potential donor is undergoing mental health treatment at the time of candidacy, their mental health professional should also contribute to the evaluation process. Olbrisch *et al.* [33] stated that the evaluation needs to be viewed as a multidisciplinary team approach, yet, did not clarify this statement. Some papers underlined that psychosocial evaluators should be well informed on, or should have prior clinical experience in transplantation [13,15,18,34]. Erim *et al.* [34], who gave detailed descriptions of the psychosocial evaluator's profile, noted that they should have a positive attitude toward living donation, based on their ethical convictions or personal life experience.

Along the same lines, 11 papers (32.4%) explicitly recommended the use of an independent donor advocate or team [12,20,22,23,31,32,34,35,37,38,43], defined as a professional who is not involved in the recipient's care, who advocates the welfare of the potential donor, and ensures safe evaluation and protection of the donor's rights.

However, their role is not always explained and varies between centers, ranging from providing education, monitoring policies and procedures to safeguard donors, or actively participating in the evaluation [23].

Can third parties be present?

In 10 papers (29.4%), the presence of a relative, significant other or even a collateral interview of this person was mentioned [16,18,20,24,27–30,33,40,43], e.g., for support [40], to ensure trustworthiness of information provided [28,43], to help understanding family dynamics (e.g., available support, coercion, family conflicts) [34,43], and to inform them about the need for tangible support during the donor's recovery [43]. Papachristou *et al.* [18] also suggested to involve the recipient during a second interview. Other authors prefer third parties not being present during the confidential part of the interview [43].

Erim *et al.* [34] were the only ones that reported organizing a second psychosomatic evaluation in which both the donor and recipient and their respective evaluators meet, with the purpose to investigating the dynamics of the donor–recipient relationship and the expectations with respect to their relationship postdonation.

Only one paper (2.9%) mentioned the use of professional interpreter services in case of language differences, and to forbid friends or relatives to translate to avoid bias, coercion, or conflict of interest [43].

Need for a cooling-off period?

Once accepted as a donor, a cooling-off period or waiting interval (i.e., period between consent and donation) is recommended in nine papers (23.5%), ranging from minimally 1 week to as much time the donor needs [12,23,27,29,31,35,40–42], to ensure that the decision to donate has been adequately considered and to allow time to withdraw their consent.

Discussion

This study is the first of its kind as guidelines, consensus statements, and protocols on psychosocial evaluation of living donor candidates have not been previously studied to this extent. Compared to the systematic review of Tong *et al.* [9] that only limitedly focused on the content of a psychosocial evaluation of living kidney donor candidates, we focused on both kidney and liver donors, addressed the psychosocial screening issues in much more detail, and also gained interesting insights in process-related factors.

At present, there is no consensus, nor strong evidence or concrete guidance on what to screen for, how to handle identified psychosocial problems, and how to perform the screening, leading to huge variability in screening practices, the risk that important psychosocial factors might be overlooked or that unnecessarily time-consuming and costly procedures are being undertaken. Although we did not include gray literature, we supplemented our searches by screening reference lists and reviewing databases specifically devoted to guidelines. Second, psychosocial evaluation protocols could have been wrongly judged by the authors, as many papers only briefly and imprecisely addressed psychosocial screening, yet, the risk of bias was minimized using a systematic approach.

Several reasons might exist why there is no uniform set of psychosocial criteria for living donor selection, of which the most important one is the lack of evidence underpinning these risk factors. Criteria seem to have been established based on opinions and individual center experiences rather than on empirical evidence. Consequently, there is the risk that relevant psychosocial aspects may be missed or that many efforts are being put in measuring psychosocial factors that might be irrelevant. Up to today, few studies have investigated predonation psychosocial risk factors for poor postdonation outcomes prospectively [5], highlighting a definite need for prospective cohort studies to help identifying those psychosocial risk factors that are indeed predictive for poor outcomes. In that way, persons who may be less ideal donors or who might benefit from postoperative psychosocial care can be identified. A second reason for the lack of uniform criteria lays in the variable terminology used to label psychosocial factors across papers. This is probably caused by the lack of a universally accepted definition of the concept 'psychosocial screening'. The development of such a definition might be an important first step in creating a common language between investigators and healthcare professionals, using consistent terminology and classification on psychosocial factors. Third, specific guidance is missing on how to measure these factors, which is in line with the observations outlined in the systematic review of Tong *et al.* [9]. Some papers did not report whether and which instruments they used, or recommended widely varying instruments. Although standardized measures might have several benefits, including ensuring a comprehensive assessment, providing a basis for prospective monitoring, and allowing comparisons of psychosocial risk factors and outcomes between centers, further investigation is needed into which tests, in addition to a semi-structured or structured interview, are the most suitable in the context of living donor psychosocial evaluation. Fourth, there is still much debate on who needs to be screened psychosocially. There are an increasing number of ways persons can donate their kidney or liver, as shown by the recently published taxonomy on donor–recipient relationships [44]. Subsequently, it can be questioned if all donor candidates or only specific subgroups require psychosocial assessment (e.g., if one wants to donate to a complete stranger or has psychosocial

problems). This necessitates setting up comparing the prevalence and incidence of psychosocial problems between various types of donor–recipient relationships. Fifth, no optimal process for evaluation seems to exist. Yet, given that psychosocial screening is an expensive and time-consuming process, most agree to apply a stepwise process, beginning with the least expensive and least invasive tests. In case of rapid deterioration of the recipient's health, urgency should not exclude a psychosocial evaluation. Sixth, with regard to the psychosocial evaluator, a wide range of healthcare professionals have been suggested. Although we cannot determine who is best placed to perform the evaluation, we believe that this person should at least be familiar with transplantation medicine or should have prior clinical transplant experience, and needs to be trained to administer and interpret psychological tests. Seventh, the involvement of a donor advocate or advocacy team was reported by only a few of the included reports. It is possible that this is not described, as donor advocacy might not be seen as an exclusive part of the psychosocial evaluation, but rather as essential throughout the overall donor process. There is also much debate whether the donor advocate should be a donor-appointed advocate, a member of the transplant team not caring for the recipient, a hospital employee outside the transplant team, an OPO, or a team of advocates [45]. Next, we agree with Sterner *et al.* [43] that an independent translator should be involved in case of language problems to avoid coercion or conflict of interest if a family member is interpreting. Finally, although a cooling-off period seems to be of utmost importance to give donors sufficient time to adequately consider their decision to donate, it was mentioned in only eight papers (24%) and the time period varied tremendously. Qualitative research may help to reveal how (future) donors, and perhaps also professionals perceive the importance and nature of this cooling-off period.

This systematic review hence reveals that there are many opportunities to further improve the quality and safety of living organ donation from a psychosocial viewpoint and underscores the need for a line of research working toward the development of uniform, standardized, and evidence-based psychosocial evaluation criteria for living donor candidates:

1. A conceptual framework of 'psychosocial' in the practice of screening living organ donors needs to be developed to enhance the use of a uniform language between transplant professionals.

2. We recommend giving priority to prospective cohort studies to identify those psychosocial risk factors that are predictive for poor outcomes in living organ donors before considering the development of new guidelines. Also the differences in psychosocial problems between various types of donor–recipient relationships should receive more attention in this regard. While awaiting results of these prospective cohort studies, we see that motivation to donate, social history, expectations about donation, basic knowledge about the risks involved in donation, relationship with recipient, and mental or emotional disorders are most common reported factors. As there is, however, heterogeneity in how to assess these factors, consensus is needed on psychometric instruments to be used, allowing for comparisons between different transplant centers.

3. As it remains unclear what the influence is of ruling out individuals for donation on the basis of psychological reasons, knowledge about psychosocial risk factors should be used not necessarily to rule out donation, but to help clinicians to identify those individuals who are most at need of additional support or therapeutic interventions pre or postdonation.

4. Efforts to standardize the process are needed internationally, and each center should have a clear protocol on all process-related aspects of a predonation psychosocial evaluation (i.e., who, what, how, by whom, when). These recommendations, however, should be tailored to fit individual needs.

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