

DROWNING IN WORDS? USING NUDIST TO ASSIST IN THE ANALYSIS OF LONG INTERVIEW TRANSCRIPTS FROM YOUNG INJECTING DRUG USERS

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This paper describes the analysis, using the software package NUDIST 2.3, of interview data from a qualitative study of young drug injectors and their risk of HIV/AIDS. The aims and processes of the study are briefly described, and the method of analysis detailed. NUDIST 2.3 is a sophisticated computer software system for managing, organising and supporting qualitative data analysis. The data for this study consisted of word for word transcripts of 105 90-minute interviews: the management and organisation of this quantity of data was a formidable task in itself, and this will be described, as will the development of initial coding frames (with cautionary tales) and the process by which increasing levels of analytic abstraction were generated. Reliability and validity has been held by some researchers to be irrelevant to qualitative research, but this is not the position adopted by this study. The paper ends with a discussion on reliability and validity and how such issues were addressed in the analysis.

Keywords: Youth injecting drug use; HIV/AIDS; research

INTRODUCTION

The advent of HIV/AIDS elicited considerable clinical and research interest in the sexual behaviour of gay men and heterosexuals (particularly those who were young and single) and the needle use of injecting drug users (IDUs). Youth was a population of interest, but mainly because young people were considered to be at risk through their sexual activities: in most of the research literature of the late '80s and early '90s,

IDUs tended to be portrayed as predominantly male heroin dependents of average age 28. The only young injectors who received research attention were street youth, or those in juvenile detention centres.

Such a view of young injectors failed to offer insights into the processes that underscored their risk of HIV/AIDS. This literature also failed to consider the drugs young people commonly injected. In Australia, as in other countries, amphetamine-type stimulants (ATS)¹ were, and still are, the most commonly injected drugs, particularly by young IDUs, but the Australian and European literature tended to focus on opiates and the American literature on opiates and cocaine. Despite these trends in publication, earlier Australian research had established the existence of teenage and young adult injectors, who were not street youth and whose risk of HIV/AIDS was different to that of older injectors (Loxley, Marsh and Lo, 1991). It seemed clear that more in-depth research into the HIV/AIDS risk of young injectors and explanations of youthful injecting risk behaviour was required.

Around the same time, researchers such as Moore and Saunders (1991) were advancing powerful arguments that young people's drug use could not be understood outside the social settings and cultural contexts in which such use occurred. Contemporary research into sexuality in the light of HIV/AIDS appeared to offer good models for research focused on the social context of risk and health behaviour. A number of studies of young people's sexual behaviour, many of them qualitative, were extending understanding of the social and individual processes underlying health behaviours, which suggested that research could explore the social, cultural and individual aspects of young people's injecting and other HIV/AIDS risks in similar ways.

The Youth, AIDS and Drugs (YAD) Study was designed to reflect some of these concerns (Loxley, 1998). The aim was to examine the individual, cultural, social and structural factors that might impinge on the safe or unsafe injecting and sexual behaviour of young people, and to do so by allowing respondents to use their own words to explain how HIV/AIDS risk was understood and managed. The outcomes of the study were to be used to develop recommendations for

¹ The term adopted by participants at a World Health Organisation meeting on these drugs to describe amphetamines, MDMA and other psychostimulants. See Programme on Substance Abuse (1997).

extending or improving the prevention of HIV/AIDS among young IDUs.

One hundred and five Perth young² people who used injectable drugs, 75% of whom were current injectors, were recruited to the study through a variety of advertising, snowballing, and direct referral strategies. They were interviewed individually and paid \$20 for their participation. No identifying information was recorded. Data were collected with a short quantitative questionnaire which assessed demographics, drug use histories and recent HIV-risk behaviour, and an in-depth qualitative interview which lasted between 60 and 90 minutes. Interview topics included initiation into illicit drug use, buying and selling drugs, description of a typical injecting/using episode, experiences of sharing needles and other injecting equipment, sexual experiences, knowledge of and attitudes to HIV/AIDS and experiences with education and harm minimisation. These interviews, which concluded with a short information and education session, were tape recorded and transcribed verbatim. A full description of study methodology and findings is available elsewhere (Loxley, 1998): this paper offers an account of key issues relating to the analysis of the interview data.

RELIABILITY AND VALIDITY

The reliability and validity of findings is of concern in all research but perhaps particularly so when investigating young people's sensitive or illicit behaviours using qualitative techniques. This is because young people are often thought to exaggerate or understate behaviours, particularly where these are illicit (Spooner and Flaherty, 1992). Additionally, some researchers suggest that validity and reliability issues are not relevant to qualitative research (Goodwin and Goodwin, 1984). This has served to make some quantitatively inclined methodologists sceptical about the value of qualitative research.

Turner, Miller and Moses (1989) maintained that researchers could obtain valid self-reported data from IDUs of all ages, provided that certain conditions were met, including the protection of respondents'

² Under 21.

privacy, guarantees of confidentiality and the independence of researchers from treatment services or law enforcement. Spooner and Flaherty (1992), who reviewed 20 studies of self-reported drug use in populations of young illicit drug users, concluded that self reported illicit drug use was generally accurate and truthful. They also found that 'interviewer ratings of honesty were sufficient for giving a broad indication of the validity of responses' (p. 18).

The applicability to qualitative research of various forms of validity and reliability including content validity, construct validity, intra-analyst reliability and internal consistency, has been described by Goodwin and Goodwin (1984). These principles were held to be of central importance in the design, implementation and data analysis of the YAD Study.

ANALYSIS: TECHNIQUES AND APPROACHES

The software system NUDIST 2.3 (Richards *et al.*, 1992)³ was used to manage, organise and support the qualitative data analysis. At its simplest, NUDIST 2.3 (Non-numerical Unstructured Data Indexing, Searching and Theorising) is a text-retrieval system. Text units (lines, paragraphs or pages as specified by the analyst) are initially indexed (NUDIST 2.3's term for coding) with nodes (NUDIST 2.3's term for codes) which are given numbered addresses and are held in separate files from documents. There is much more to NUDIST 2.3 than retrieval, however. Sophisticated text searching is available for further indexing, as are a variety of node-building facilities which allow the exploration of hypotheses and intuitions about relationships. NUDIST 2.3 explicitly supports the development of indexing tree-structures, with no limit to their depth, so that the increasing abstraction of nodes can be managed. It also supports the use of both user-generated and system-generated comments which can be attached to any node so that its derivation can be documented. Changes to indexing can be maintained or discarded, so that any text unit can be

³ Later versions are now available but do not differ in principle from the version described here.

indexed in as many different ways as the analyst wishes and the computer memory will allow (Richards *et al.*, 1992). NUDIST 2.3 sets up two databases for each project: the Document System and the Index System. The application of these to the YAD Study is shown in Figure 1.

Figure 1 shows that the (on-line) documents and generated memos were stored within the Document System, and that the Indexing System was independent of the Document System, so that indexing could be modified as analysis proceeded. Transcripts were given headers which contained information about place, date, time of interview and name of interviewer, and any relevant information such as serious interruptions, and sub-headers were used to divide transcripts into major topics within the interviews.

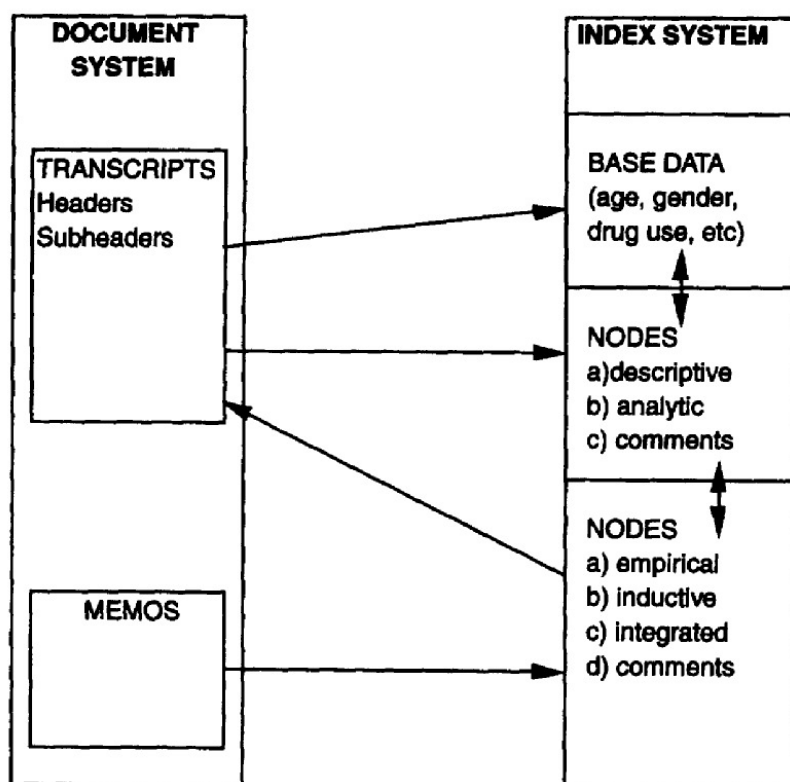


FIGURE 1 The two database system of NUDIST 2.3 and the analysis of qualitative data in the YAD Study.

Text units consisted of a single question or a single answer which allowed for responses to be analysed in context. Three different categories of nodes were used:

- Base data which referred to complete transcripts and contained factual information such as age, gender or frequency of drug use.
- Descriptive nodes which consisted of initial indexing by topic.
- Analytic nodes which were derived from descriptive nodes.

Comments, both user-generated and system-generated, became part of the Indexing System and could be browsed to overview analytic progress. Once memos were introduced into the Document System, they were indexed by nodes based on hypotheses derived from the literature, processes discovered in the data, and/or findings which integrated both of these. Memo nodes were related back to individual transcripts, by noting where particular passages of text occurred, and ideas described in memos were used in further analytic node-building.

The intent of the qualitative analysis was to both understand and describe the phenomena under study from the actors' perspectives, and to explore possible relationships suggested by the literature. The following general framework for stages of analysis was adopted: Summarisation of the data; Description of variables; Preliminary presentation of the data; Search for relationships; and Interpretation/verification.

Summarisation of the data

Transcripts were initially coded by the topics into which the interview was divided.

Description of variables

Once all relevant textual material had been indexed for topic, each topic was retrieved across all respondents, and read for content. Themes within each topic were then identified. Such themes were initially descriptive but the emergence of patterns suggesting more conceptual notions was noted in memos, and ultimately indexed. Initial topic categories could be dissected more than once depending on the questions asked of the data.

TABLE I Example of secondary indexing: needle sharing as primary topic

Index Structure: Branch '9.1.1' (Using Needles and Other Equipment)

9 1 1.	Using needles, other equipment
9 1 1 1.	Sharing other equipment
9 1 1 2.	Risk perception
9 1 1 3.	Sharing means
9 1 1 5.	Text 'first' and 'own'
9 1 1 6.	Text 'filter'

Two categories of themes were developed from the text. On the one hand themes related to issues of importance to respondents, but a search for issues such as risk perception which had been suggested in the literature as central in understanding risk behaviour was also undertaken. In the latter case, such investigations as were fruitful were pursued; if the hypothesised phenomenon or effect did not appear to be important the search was abandoned and this was noted in memos. Themes within each of the major descriptive nodes were developed as coding sub-branches, as demonstrated in Table I.

Table I shows that the branch 9.1.1 was later sub-categorised into at least five other categories (there were more but only a few are presented for simplicity) representing different themes as they became apparent. The first three of the categories in Table I were derived from text content, the last two from text search for specific words or phrases which were felt to offer particular insights (e.g. in 9 1 1 5, the text was searched for all references to 'owning' needles or using them first).

Themes (which became nodes in NUDIST 2.3) were summarised in tables which contained the essence of the individual's comments, and references to quotations which were felt to be good illustrations. Table II is an example of a partial table developed from category 9 1 1 5, in Table I above.

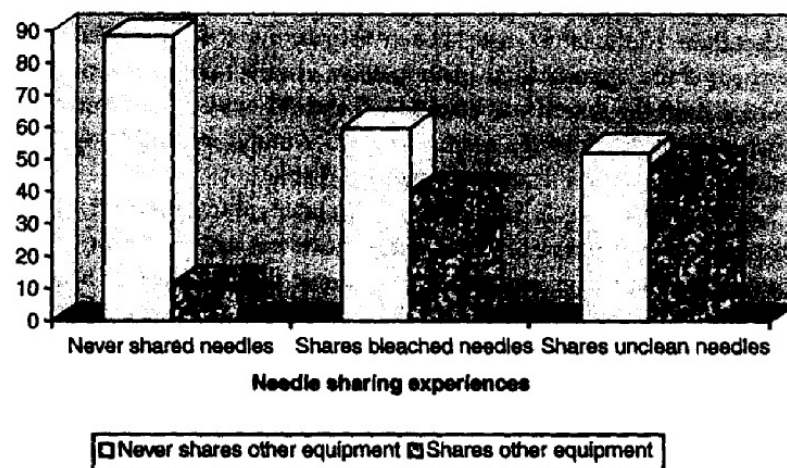
This use of tables ensured that a similar degree of density was used in the summarisation of transcript material, which assisted in the maintenance of analytic internal consistency.

Preliminary presentation of the data

Graphs were used to present some aspects of the data where simple categorisation of respondents possessing or not possessing certain characteristics was possible. Figure 2, for example, shows an apparent

TABLE II Example of theme summary table: node 9 1 1 5

(Gender) #	'Going first' and 'owning' needles: injectors
(F) 84	The 'one who couldn't be bothered' to get a clean needle went second – wouldn't matter with her lover because they're having unsafe sex anyway
(F) 114	Her lover lets her go first – he doesn't care – she doesn't want the blunt needle – people don't argue about it – too keen to get on and inject – someone volunteers to go first
(F) 28	Her girlfriend (lover) makes her go first because she likes to watch her out of it – also she has shared more times
(F) 24	She who scores the pick uses it first normally
(F) 82	Knows a couple who didn't use because they couldn't decide – she'd probably let anyone go first (and her friends would try to stop her)

FIGURE 2 Sharing needles and sharing equipment other than needles: injectors ($n = 64$).

relationship between sharing needles and sharing other injecting equipment, with those who shared needles being more likely to share other injecting equipment.

In other cases summaries of the content of the themes were presented, with interview extracts as illustrations. As an example, the following is a partial account of the context of sharing drugs:

Mixing in the same spoon has to be seen in the context of using powders such as amphetamines. Respondents described the way in which they usually pooled their

money to purchase one packet of drugs which they then attempted to share equally. Since liquid can be measured more precisely than powder, mixing the powder with a measured quantity of water in a single spoon (e.g. 60 ml for two people, 90 ml for three, etc.) and then drawing up measured amounts through a common filter into separate syringes was common.

I: If you're mixing up, do you do it in the same spoon, or do you have separate spoons?

R: Oh you'd have to use the same spoon, anyway, 'cos couldn't, like really get equal out and put a bit on each spoon, like just put all in one spoon and pour, like if there's three of youse, you'll put in ninety mls of water. You know you get thirty each and then everyone like takes it off...

Adding powder to the water increases its volume so that in order to share equally it should all be drawn into a syringe to measure the volume again. It is thus particularly important that at least one needle is sterile. This was sometimes the so-called 'grey nurse': a particular make of syringe included in an AIDS Pack with which IDUs dislike injecting. Thus it may be kept clean for measuring:

R: ... you get ... that one's called a grey nurse. You use that. No-one uses that needle. You always mix up with that one because no-one will use it because they're a pain...

I: You use the grey nurse to measure out your water to mix up the second taste?

R: Yeah, and you suck it up in that and how much is in it you squirt half back in your spoon and they get theirs and suck it up, yeah.

Search for relationships

There were two sources of hypotheses about relationships. On the one hand, these were often suggested by accounts given by respondents; on the other hand the literature suggested that some variables, such as

gender, might structure responses. The extensive use of memos enabled the derivation of all hypotheses about relationships to be tracked. The multiple indexing of these memos rendered these derivations, whether from the literature or from the data or from both, explicit. In this way it was always possible to return to the point at which a particular investigation began to see how ideas had changed and developed as analysis proceeded. These 'audit trails' (Richards *et al.*, 1992) helped to maintain the consistency of indexing.

Interpretation and verification

Interpretations were based on evidence in the data and cross-validation with findings in other studies. They were discussed with colleagues at the time of analysis. Verification of interpretations with respondents was not possible because they had been interviewed anonymously and could not be re-contacted. However, draft findings were read by colleagues and other professionals working with young IDUs, and the interpretations re-examined against the data.

INEFFECTIVE ANALYSIS APPROACHES

The size of the project was a major difficulty: 105 interviews, each lasting up to 90 minutes and transcribed verbatim gave rise to some 3,000 pages of text. Early attempts at analysis (later discarded) left the analyst drowning in words: gasping for techniques by which to manage this volume of data, and concepts by which to structure the output.

The initial analysis was undertaken with the first 45 interviews and although the results were used to revise the Interview Guide the analysis itself was discarded. The main problem with this first cast was that the indexing structure was too detailed. An example related to the major topic of injecting is given in Table III.

The first column of Table III shows the initial indexing structure which was an attempt to code all possible aspects of injecting that were thought to be related to risk. Problems were immediately apparent: the categories were not independent of each other and thus very small amounts of text could be indexed several times, and it was difficult for the two indexers to maintain consistency with such a tight structure.

TABLE III Examples of initial and final indexing outlines for injecting drug use

<i>Initial indexing outline</i>		<i>Final indexing outline</i>	
9.1	Drugs	9	Risky behaviour – drugs
9.1.1	Personal	9.1	Personal
9.1.1.1	Frequency of sharing needles	9.1.1	Using needles and other equipment
9.1.1.2	Circumstances of sharing needles	9.1.1.1	Sharing other equipment
9.1.1.3	Frequency of sharing other equipment	9.1.1.2	Hypothetical and risk perception
9.1.1.4	Circumstances of sharing other equipment	9.1.1.3	Sharing means ...
9.1.1.5	Last sharing occasion	9.1.1.5	Text 'first' and 'own'
9.1.1.5.1	Antecedents	9.1.2	Acquiring needles and other equipment
9.1.1.5.2	Behaviour	9.1.3	Cleaning needles and other equipment
9.1.1.5.3	Consequences	9.1.4	Behaviour change since AIDS
9.1.1.6	Perceived risk of sharing	9.1.5	Social support for safe behaviour
9.1.1.6.1	Decision making re partners		
9.1.1.7	Sharing with sexual partners		
9.1.1.8	Acquisition of sterile equipment		
9.1.1.8.1	Perceived ease/difficulty		
9.1.1.8.2	Usual source of supply		
9.1.1.8.3	Difficulties experienced/feared		
9.1.1.9	Use of bleach		
9.1.1.9.1	Knowledge/beliefs about bleach		
9.1.1.9.2	Perceived response efficacy		
9.1.1.9.3	Frequency of use		
9.1.1.10	Safe use self-efficacy		
9.1.1.10.1	If hanging out		
9.1.1.10.2	If with friends/partner		
9.1.1.10.3	If drugs on the table		
9.1.1.11	Behaviour change since AIDS		
9.1.1.12	Similarity to peers		

More fundamentally, however, this approach failed to meet the first criteria for analysis which was to find the concepts and structures in, rather than to impose them upon, the data. When this was realised, the attempt was discarded and a new indexing structure, similar to that in the second column in Table I, was developed. This, as described above, was initially descriptive, with more detailed indexing occurring as analysis proceeded.

A second significant difficulty which occurred in the early stages of analysis was not unlike the first, but occurred at a more macro level. The AIDS Risk Reduction Model (ARRM) (Catania, Kegeles and Coates, 1990) had been used, among other literature, to develop topics

and sub-topics for the Interview Guide. The ARRM is a stage model with three stages: *labelling* (oneself at risk, the behaviour as risky, and the disease as undesirable); *decision-making* (making a commitment to low risk activities) and *action* (seeking out and enacting strategies to meet one's goals).

It was originally thought that the stages of this model would provide a conceptual framework for the analysis of data. It was soon recognised, however, that the model was not appropriate since it had been developed to reflect behavioural change – that is, the progression of individuals practising risky behaviour from ignorance about their risk to safer behaviour. Apart from the realisation that the only way to establish such progression empirically would be through longitudinal research and the YAD Study was cross-sectional, the model also did not reflect the situation of teenagers in 1991 and 1992 who had known about HIV/AIDS long before they had started using drugs, and had developed their drug using practices to accord with their understanding of HIV/AIDS risk.

A third problem, reflecting the initial inexperience of the analyst, was the attempt to use all the data. Inevitably, long interviews threw up a great deal of material that was interesting and insightful (and quite a lot that was neither of those) and it was frustrating to have to ignore some of it in order to keep the narrative focused in a way that made sense to the reader and addressed the research questions. Ultimately, however, the decision was made to structure findings around one or two unifying themes, and to use relevant sections or extraneous material in additional or later reports.

EFFECTIVE ANALYSIS APPROACHES

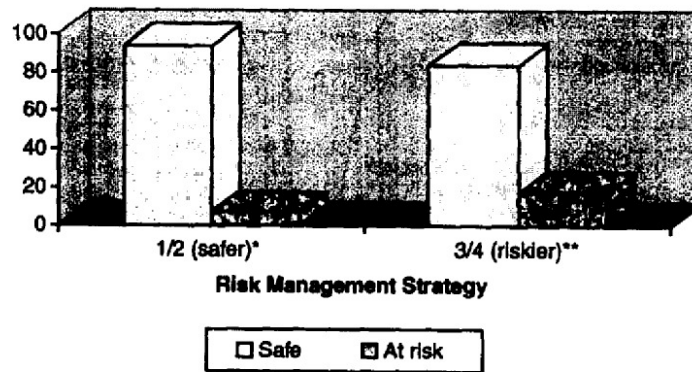
The most important event in the analysis of data occurred when it became apparent that most, if not all, respondents had clear views about the situations and circumstances in which they would or would not share needles at some future time, and that these views appeared to structure their behaviour. Moreover, there was considerable consistency between what many respondents believed, had done in the past and intended to do in the future in relation to HIV/AIDS. These clear and consistent views suggested that respondents had made decisions

about HIV/AIDS which were coherently related to their experiences, their assessment of their personal risk, and their knowledge and attitudes towards HIV/AIDS. The decisions were expressed by respondents as behavioural intentions but could be conceptualised as personal strategies for dealing with the risk of HIV infection. For that reason they were termed Risk Management Strategies (RMS) (see also Loxley and Ovenden, 1995). Four non-overlapping RMS for injecting were discovered (brackets indicate percent of the 79 injectors who endorsed each strategy):

1. Accept used needles from no-one (44%).
2. Accept used needles from a lover or friend only if bleached (15%).
3. Accept used needles only from a lover (28%).
4. Accept used needles only from a lover or close friend (10%).

The RMS categories (and conceptually similar categories for sexual behaviour called RMSS) were used as the primary grouping variable, and most other analyses proceeded from this, which allowed the reporting of the various levels of knowledge, attitudes and behaviours to be structured around a unifying theme. As an example, Figure 3 shows the relationship between the assessment of their own risk of HIV/AIDS made by injectors, and their RMS.

Figure 3 shows there was an apparent relationship between risk assessment and RMS such that although most injectors considered



*RMS = 1/2 Share with no-one or share only bleached needles with lovers or friends
 **RMS = 3/4 Share only with lovers or share only with lovers or friends.

FIGURE 3 Personal risk assessment by Risk Management Strategy: Injectors (n = 75).

themselves to be at little or no risk of HIV infection, more of those who espoused a more risky RMS believed themselves to be at some risk.

A second unifying construct was found in a model of levels and sources of influence. The interview was designed to elicit information about the widest possible range of influences that might impinge on HIV-risk: these influences were conceptualised in terms of a public health systems model similar to that proposed by Holder (1989) for the prevention of alcohol-related harm. Holder's model categorised drinking-related factors in terms of five levels: these were adapted for young IDUs as: (a) individual factors, (b) the immediate drug using environment, (c) the family and peer environment, (d) the community environment, and (e) the larger legal and cultural environment (Figure 4).

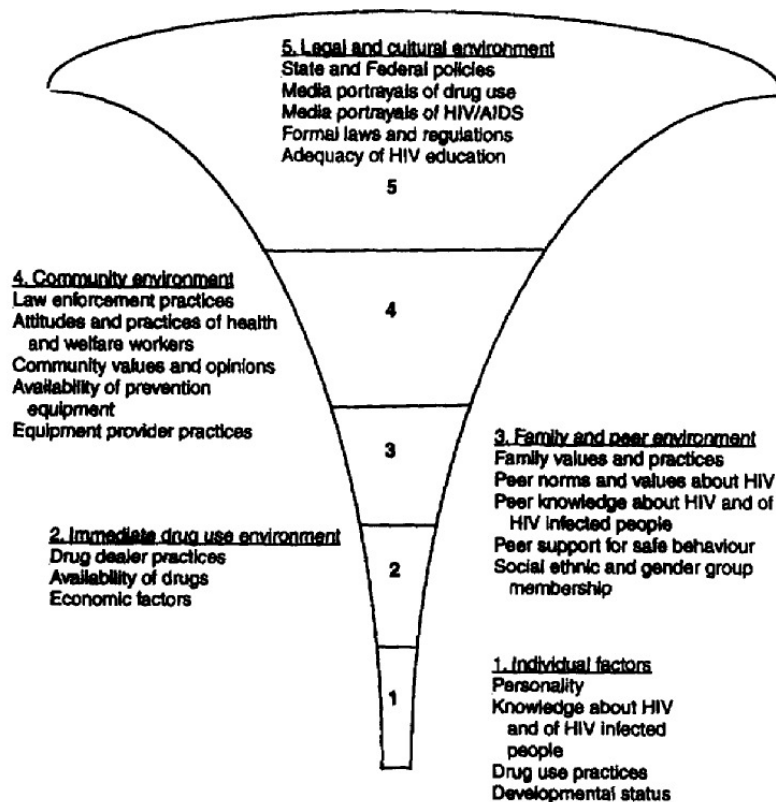


FIGURE 4 Holder's (1989) prevention conceptual model adapted for young IDUs.

Results, discussion, theoretical considerations and recommendations were couched in terms of this model.

THE RELIABILITY AND VALIDITY OF THE DATA

The conditions which Turner *et al.* (1989) had specified as necessary to obtain valid self-reported data from IDUs were met in the YAD Study, and interviewer ratings of co-operation and truthfulness, as recommended by Spooner and Flaherty (1992), were collected. Most respondents were judged to be both truthful and co-operative. The validity and reliability of the data were further assessed according to Goodwin and Goodwin's (1984) criteria for qualitative research. *Content validity* requirements were addressed in that the study group was both heterogeneous and of such a size that little new material was forthcoming towards the end of data collection; the respondents were judged to be honest and some were very articulate; and the interview structure allowed them to discuss issues which were salient to them, as well as answer questions put to them by the interviewer. To address issues of *construct validity*, topics in the interview were based on, and findings compared to, the literature, and interpretations and conclusions were subject to peer review, both from colleagues and from professionals working with young drug users. A concern for *intra-analyst reliability* was expressed in the use of memos which tracked the development and derivation of all analysis categories, and regular meetings between the researcher and assistant to ensure that these categories remained consistent. *Internal consistency* was maintained by having all respondents interviewed with similar interview materials.

There was also considerable consistency between quantitative and qualitative accounts of risk behaviour, and accounts of behaviour, attitudes and intentions tended to coalesce, suggesting that they represented thoughtful attempts by respondents to give a true account of relevant issues. In the case of almost every relevant issue, the data were cross-validated by reports from other studies. Cross-validations of the social dynamics of needle sharing and unsafe sex suggested that the motivations and attitudes of young IDUs in Perth were little different to those of IDUs and young people in other cities of Australia, and, indeed, other countries (Loxley, 1998).

CONCLUSION

The YAD Study offered an insight into the lives of young people who inject drugs that was previously not available. Importantly, it demonstrated that injecting drugs was a common behaviour for some relatively normal young people, but that their understanding of the risks associated with injecting was inadequate at best, and tainted by their desire to inject at worst. From this a number of recommendations about education and prevention programs were made.

The study provided an opportunity for one researcher, whose previous experience with qualitative data analysis was limited, to discover some of the pitfalls of dealing with long interview data, and develop techniques for surviving in a sea of words. The significant lessons were that the use of computer software such as NUDIST 2.3 was necessary but not sufficient: without structuring constructs the words were just that – words. With structure, they become theories and findings which were able to bear fruit as recommendations for the prevention of HIV/AIDS among young injecting drug users.

Acknowledgments

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